Hemoptysis in pregnancy: A clue not to be missed in molar pregnancy

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Introduction: Molar pregnancy or known as a gestational trophoblastic disease (GTD) which presents with hemoptysis as a first symptom is extremely rare. The characteristic of gestational trophoblastic disease is the formation of malignancy-like cells and focal vascular changes, including the formation of arteriovenous malformations (AVMs).

Description: A 41 years old lady with irregular menses come to the emergency department (ED) with two episodes of hemoptysis in one day. All systemic examinations were unremarkable, the patient was discharged, and the next day, the patient presented again to ED with the symptom of per vagina bleeding and possible passing out product of conception. A urine pregnancy test was positive and transabdominal sonography showed molar pregnancy. Case was referred to O&G team for evacuation of the product of conception and the patient was discharged after a few days. A week later, the patient developed per vaginal bleed again, Beta human chorionic gonadotropin (HCG) taken showed increasing trend, and patient was started on Methotrexate and Dactinomycin (Act-D) regime.

Outcomes: Gestational trophoblastic tumors usually arise from abnormal trophoblast cells formed in a complete molar pregnancy. Cure rates are nearly 100% due to its sensitivity to chemotherapy. In hemoptysis molar pregnancy-related presentation, chest x-ray remains the appropriate investigation for assessment of potential lung metastases; however, if symptoms persist CT thorax is indicated.

Conclusions: Although pulmonary AVMs secondary to metastatic GTD are extremely rare, it is clear from this report that there is a risk of rupture causing hemoptysis. When diagnosed, we suggest that urgent referral for embolization should be considered to reduce the risk of bleeding. Also, any women in reproductive age coming to the emergency department presenting with hemoptysis should have a urine pregnancy test done to exclude molar pregnancy.

Isolated spontaneous rupture of urinary bladder (SRUB) post spontaneous vaginal delivery (SVD): A diagnostic challenge

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Introduction: Bladder rupture in puerperium is a well-known complication following cesarean delivery. However, isolated spontaneous bladder rupture post SVD is an extremely rare condition. Clinical presentation of bladder rupture range from diarrhea and vomiting to acute abdomen causing a diagnostic challenge to the Emergency doctor.

Description: A 28-year-old para 2 homebirth seven days ago, presented with complaints of sudden onset of breathlessness associated with abdominal distension. On arrival, she was tachypnoeic, tachycardic, and had a distended abdomen which was tender and guarded. Bedside scan revealed gross free fluid. An indwelling catheter inserted drained 1.3L of gross hematuria. As the abdomen was grossly distended, a bedside peritoneal tapping was done and it drained 5L of hemoserous fluid. An immediate CT abdomen revealed an extravasation of contrast from a defect over the posterior body of bladder, at the vesicoureterine pouch, measuring of 0.6cm in diameter. Other pelvic and abdominal organs were normal. As patient refused for surgical intervention, she was treated conservatively with foleys catheterization and was discharged well two days later.

Discussion (Outcomes): Isolated SRUB following vaginal delivery is extremely rare, and is considered as a surgical postpartum emergency. Common presentation are abdominal pain and/or distention, fever, oliguria, hematuria, and vomiting postpartum. A diagnostic algorithm has been proposed in order to identify SRUB.

Conclusions: Despite being a rare occurrence, our Emergency doctors should be aware of possibilities of SRUB in postpartum women presenting with abdominal pain, anuria/hematuria even in a non-complicated vaginal delivery.

References:
1. Stabile G, Cracco F, De Santo D, et al. Spontaneous Bladder Rupture after Normal Vaginal Delivery: Description of a Rare Complication and Systematic Review of the Literature. Diagnostics. 2021;11(10):1885. doi:10.3390/diagnostics11101885
2. Farahzadi A, Mohammadipour S. A Late Presentation of Spontaneous Bladder Rupture During Labor. Urol Case Rep. 2016;8:24–25. doi:10.1016/j.eucr.2016.05.007
3. Hadian B, Nazarpoor S, Garshasebi M, Zafar Mohtashami A. Missed bladder rupture following vaginal delivery: Possible role of assessing ascitic fluid
An airway emergency from an invading climbing perch

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Introduction: Accidental entry and impaction of a whole live fish in the upper aero digestive tract is uncommon1. We report on a case of an accidental ingestion of a live climbing perch fish in the hypopharynx of a man which led to airway complications.

Description: A 38-years old male presented to the emergency department (ED) with a history of accidental ingestion of a whole climbing perch fish in the hypopharynx, with its tail located at the upper pharynx. Endotracheal intubation was successfully attempted. Laryngoscopy findings revealed a head-down live fish impacted at the hypopharynx, with its tail located at the upper pharynx. Endotracheal intubation was successfully attempted. Attempts to remove the fish with a Magill forceps post-intubation were unsuccessful as the fish’s reverse spines lodged onto the mucosal wall. There was presence of crepitus over bilateral neck. Neck radiographs revealed evidence of subcutaneous emphysema and presence of the fish bone.

Outcomes: The fish was removed successfully using laryngeal forceps in a twisting method to deliver the head out first in the operating theater. Esophagoscopy post-removal noted multiple abrasions and lacerations at the hypopharyngeal wall. Patient was subsequently extubated and able to tolerate orally well.

Conclusions: Whole live fish ingestion is a life-threatening airway emergency. Timely emergent intervention is required to secure the airway and vigilant removal of the whole fish to prevent complications including pharyngeal perforation, embedded fish spines, and death from asphyxiation2.

References:
1. Parida PK, Surianarayanan G. Accidental entry of fish into throat while bathing in a pond. Case Rep Med. 2013; 2013:604687. doi: 10.1155/2013/604687. Epub 2013 Nov 25. PMID: 24371443; PMCID: PMC3859168

2. Tang, Mee & Ching, L & Brito-Mutunayagam, S & Govindaraju, Revadi. (2013). Fish in throat: An Unusual Foreign Body. The Medical Journal of Malaysia. 68. 469–70.

A ticking time bomb: Case of acute upper airway obstruction

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Background and Objectives: Dealing with upper airway obstruction is a fundamental requirement in emergency settings. Prompt recognition and intervention will result in a good outcome for the patient.

Method: We presented a case in which our pre hospital care team responded to an elderly obese lady with acute onset of shortness of breath and stridor at night. She complained of rapidly growing left neck swelling which progressed within a couple of hours from a walnut size to the lemon size.

Despite being given a high flow mask 15 L/min she was still tachypnic and agitated. Upon presentation, we noticed the whole neck was profusely swollen predominantly over the left side of the neck. Difficult airway management scenario was immediately anticipated. The respective emergency physician, anesthetist and otorhinolaryngologist teams were informed to co-manage the situation simultaneously. She was successfully intubated via C-MAC with bougie using the awake intubation technique by the emergency medical officer on the first attempt despite the difficulty. Contrast-enhanced Computed Tomography (CECT) neck revealed a deep-seated neck abscess, hence proceed with incision and drainage by the ENT team. 8cc pus was drained, at the retropharyngeal and left pharyngeal spaces and post-operotive plan was carried out.

Result/Conclusion: An acute upper airway obstruction is always a challenging life-threatening scenario to the emergency personnel. Therefore, it requires an emergent, yet controlled, approach to secure the airway promptly and maintain oxygenation at the same time.

Anticipation of difficult intubation with good clinical judgment are essential along with good teamwork in handling such life-threatening situations.

COVID-19: The catalyst needed to modernize prevocational continuing medical education in emergency medicine in Australia

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References:
1. Parida PK, Surianarayanan G. Accidental entry of fish into throat while bathing in a pond. Case Rep Med. 2013; 2013:604687. doi: 10.1155/2013/604687. Epub 2013 Nov 25. PMID: 24371443; PMCID: PMC3859168

2. Tang, Mee & Ching, L & Brito-Mutunayagam, S & Govindaraju, Revadi. (2013). Fish in throat: An Unusual Foreign Body. The Medical Journal of Malaysia. 68. 469–70.
Background: Decreased Emergency Department presentations and widespread disruptions to prevocational continuing medical education opportunities occurred as a result of the COVID-19 pandemic of 2020 in Australia (1). The effects of these disruptions, which are ongoing, on the medical education of prevocational doctors in Emergency Departments are unknown.

Objectives: This study aims to investigate the quality of continuing medical education of interns in Victorian Emergency Departments during COVID-19.

Method: The validated Postgraduate Hospital Educational Environment Measure (PHEEM) questionnaire (2) was modified to produce eight online survey statements relevant to the Emergency Department educational environment. A cohort of 220 interns working in Victorian Emergency Departments during the first lockdown of the COVID-19 pandemic were invited to participate through the social media platform. Main outcome measures were intern perceptions of educational environment and ability to participate in resuscitation presentations.

Results: Fifty-six survey responses were returned, with an estimated survey response rate of 25.5%. Mean survey scores reflecting intern perceptions of access to educational programs (2.0 ± 1.2 (SD)), practical skill opportunities (2.3 ± 1.01), access to learning opportunities (2.25 ± 1.05), preparedness for the future (2.38 ± 1.07) and enjoyment of work (2.38±1.15) were statistically significantly lower than previous population means (p < 0.05) (Figure 1). Intern experiences of access to clinical supervision (2.96 ± 0.97) and teachers (2.79 ± 1.15) scored most highly and were comparable to previous population means.

Conclusion: Emergency medicine continuing medical education of interns in Victoria has been damaged by COVID-19. In order to improve patient safety, these novel results provide an impetus for modernizing prevocational medical training in the emergency medicine setting.

References:
1. Thornton J. Covid-19: A&E visits in England fall by 25% in week after lockdown. BMJ. 2020;369:m1401.
2. Giamello JD, Abram S, Bernardi S, Lauria G. The emergency department in the COVID-19 era. Who are we missing? Eur J Emerg Med. 2020;27 (4):305–6
3. Gough J, Bullen M, Donath S. PHEEM ‘Downunder’. Medical Teacher. 2010;32(2):161–3.

Epidemiology, clinical presentations, and outcome of patients presenting to the emergency department after a COVID-19 vaccination: An observational study

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Background: The World Health Organization declared the COVID-19 pandemic on 11 March 2020 (1). In 2021, several vaccines were provisionally approved to reduce the risk of transmission and hospitalization of COVID-19 infection (2). A surge in COVID-19 vaccination was seen between August and October 2021 in Victoria, Australia (3).

Objectives: We hypothesized this led to an increase in Emergency Department (ED) presentations.

Method: Patients in this study were adults who presented to the ED within 21 days of receiving a dose of a COVID-19 vaccine between 11/8/21—14/11/21. All cases underwent chart reviews to extract epidemiological features, clinical presentations, ED assessments, investigations, and disposition.

Results: A 968 patients were included in the study, comprising 6.1% of all ED presentations during the study...
### TABLE 1: The demographics and clinical features of patients presenting to the emergency department after the COVID-19 vaccination group by the type of vaccination

| Vaccination type | AstraZeneca (N = 274) | Pfizer (N = 646) | Moderna (N = 44) | Not recorded (N = 4) | Total (N, %) |
|------------------|-----------------------|-------------------|-----------------|---------------------|--------------|
| **Gender**       |                       |                   |                 |                     |              |
| Male             | 124 (12.8%)           | 304 (31.4%)       | 23 (2.4%)       | 2 (0.2%)            | 453 (46.8%)  |
| Female           | 149 (15.4%)           | 339 (35%)         | 21 (2.2%)       | 2 (0.2%)            | 511 (52.8%)  |
| Other            | 1 (0.1%)              | 3 (0.3%)          | 0 (0%)          | 0 (0%)              | 4 (0.4%)     |
| **Days between vaccination and ED presentation** | | | | | |
| Day (IQR)        | 5 (8)**               | 4 (5)**           | 3 (6)           | NA                  | 4 (6)        |
| **Presenting complaints** | | | | | |
| Chest pain       | 62 (6.4%)             | 337 (35%)         | 22 (2.3%)       | 1 (0.1%)            | 422 (43.6%)  |
| Headache         | 67 (7%)               | 31 (3.2%)         | 2 (0.2%)        | 0 (0%)              | 100 (10.3%)  |
| Palpitations     | 10 (1%)               | 63 (6.5%)         | 5 (0.6%)        | 1 (0.1%)            | 79 (8.1%)    |
| Short of breath  | 15 (1.6%)             | 37 (3.8%)         | 3 (0.3%)        | 0 (0%)              | 55 (5.7%)    |
| Febrile illness/ malaise | 20 (2%) | 26 (2.7%) | 3 (0.3%) | 1 (0.1%) | 50 (5.2%) |
| **Mode of arrival** | | | | | |
| Ambulance        | 61 (6.3%)             | 124 (12.9%)       | 10 (1%)         | 0 (0%)              | 195 (20.1%)  |
| Own transport    | 119 (12.3%)           | 300 (31.1%)       | 25 (2.6%)       | 2 (0.2%)            | 446 (46.1%)  |
| Public transport | 31 (3.2%)             | 85 (8.8%)         | 3 (0.3%)        | 0 (0%)              | 119 (12.3%)  |
| Police vehicle   | 0 (0%)                | 0 (0%)            | 1 (0.1%)        | 0 (0%)              | 1 (0.1%)     |
| Not specified    | 63 (6.5%)             | 137 (14.2%)       | 5 (0.5%)        | 2 (0.2%)            | 207 (21.4%)  |

*Excluding missing values.

**Statistically significant (P-value = 0.002).**

### TABLE 2: The main symptoms of patients in the emergency department and emergency investigations

| Vaccination type | FBE | Troponin | D-Dimer | ECG | CXR | CT Brain | CT Chest (including CTPA) |
|------------------|-----|----------|---------|-----|-----|----------|--------------------------|
| AstraZeneca      | 218 (80%) | 79 (29%) | 150 (55%) | 131 (48%) | 62 (23%) | 17 (6%) | 5 (2%) |
| Pfizer           | 457 (71%) | 369 (57%) | 117 (18%) | 456 (71%) | 214 (33%) | 13 (2%) | 13 (2%) |
| Moderna          | 34 (77%)  | 26 (59%)  | 7 (16%)  | 30 (68%)  | 12 (27%)  | 3 (7%)  | 2 (5%)  |
| Not recorded     | 712 (74%) | 475 (49%) | 274 (28%) | 618 (64%) | 288 (30%) | 33 (3%) | 20 (2%) |

*Including all cases (recorded and unrecorded vaccination type)

FBE: full blood examination, ECG: electrocardiogram, CXR: chest X-ray, CT: computerized tomography, CTPA: computerized tomography pulmonay angiogram
Impact of the COVID-19 pandemic on health care delivery to im/migrant population: A retrospective multi-center study

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Background: Health care inequity has been widely affected marginalized and im/migrant communities across the world (1). The COVID-19 pandemic has highlighted the disparities and the urgent need to address unbalanced and unjust health care delivery to the im/migrant population (2).

Objectives: In this study, we assessed the equity of access to the emergency care system among COVID-19 im/migrants in Isfahan province, Iran.

Methods: 67 hospitals across Isfahan province were included in this study between 1 March 2020 and 31 May 2020. Patients’ medical records were used to extract clinical manifestations, comorbidities, ethnicity, patient management and their outcomes during hospital admission.

Results: 5128 PCR confirmed COVID-19 cases were included in this study during the study period, 3.3% (168) of them were im/migrants. 562 (11%) were representations and all were non-immigrants. There were no differences between gender, clinical presentations, comorbidities, and "length of stay in hospital" between im/migrants and non-immigrants. Im-migrant patients were significantly younger but had a higher rate of poor outcomes including tracheal intubation [(odds ratio = 1.9, 95% CI = 1.2–3.1), p = 0.009] and in-hospital mortality [(odds ratio = 1.6, 95% CI = 1.1–2.4), p = 0.02].

Conclusions: In our study, although im/migrant and marginalized communities had equitable access to emergency care, they had a higher risk of adverse outcomes. These findings show that the social determinants of health may play an important role in health equity and should be acted upon by health policymakers to remove the imbalance in health care delivery.

References:
1. World Health Organization. WHO Director-General’s opening remarks at the media briefing on COVID-19 – 11 March 2020 [Internet]. 2020 [Available from: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.
2. Therapeutic Goods Administration. COVID-19 vaccine: Provisional registrations [Internet]. 2022, January 20 [20 January 2022]. Available from: https://www.tga.gov.au/node/936162.
3. Australian Government - Department of Health. COVID-19 vaccine rollout update – jurisdictional breakdown – 30 November 2021 2021 [updated 30 November 2021]. Available from: https://www.health.gov.au/resources/publications/covid-19-vaccine-rollout-update-jurisdictional-breakdown-30-november-2021.

Indicated versus anticipated VBG’s in the emergency department: Evaluating the overuse of VBG’s initiated by nursing staff in the emergency department

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Background: Choosing wisely is an initiative of the Australasian College for Emergency Medicine that seeks to avoid unnecessary medical tests in the emergency departments (EDs). Venous blood gas has been identified as one of the overused tests in the ED.

Objectives: We hypothesize the impact of an intervention to reduce the number of VBGs in the ED.

Method: We collected 497 consecutive VBGs ordered in the ED. Triage notes and categories were extracted and presented to Registered Nurses (RN) and Critical Care Registered Nurses (CCRN). Each nurse was given a randomly selected 50 VBGs asked whether they would perform a VBG based on the information. Following a brief educational intervention about the indication of VBGs (1), nursing staff were asked again whether they would perform a VBG based on the same information.
Results: Out of 497 VBGs, 275 (55.3%) were assessed by CCRNs and 222 (44.7%) by RNs. After the intervention, there was a reduction in the use VBGs of 29.5% for RNs compared with 17.6% for CCRNs. Prior to the intervention, 250 (50.3%) answered “yes” to perform a VBG. After the intervention, 130 (26.2%) nurses answered “yes”. The overall reduction of 120 (24.1%) VBGs post-intervention is statistically significant (P < 0.001, odds ratio 15.8; 95% confidence interval 8.5–29.1).

Conclusion: A simple intervention is a reliable tool to reduce the number of unnecessary and not clinically indicated VBGs in EDs. Our findings have the potential to reduce the yearly costs associated with blood gas analysis in the EDs.

Reference
The Royal College of Pathologists of Australasia (RCPA) and the Australasian College for Emergency Medicine (ACEM). Guidelines on pathology testing in the Emergency Department. Australasian College for Emergency Medicine 2018.

Acute myocardial infarction and Steven Johnson syndrome post COVID-19 vaccination (Gam-COVID-Vac)

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Introduction: Adverse events post vaccination present a complex medical management challenge in the emergency department (ED). Acute myocardial infarction (AMI) is a frequent diagnosis in the ED. Steven Johnson Syndrome (SJS) is a rare severe cutaneous adverse drug reaction. This case report presents AMI and SJS as probable adverse events following COVID-19 vaccine.

Description: This case describes a 59-year-old, Filipino, male who presented at the ED with one month history of chest pain and three week history of skin rashes both of which were noted to have developed post the first and second doses of Gam-COVID-Vac vaccine.

Outcomes: AMI was diagnosed based on cardiac symptoms, ECG findings of ST elevation in anteroseptal wall and elevated troponin levels. SJS was diagnosed based on the pathognomonic skin lesions, histopathological findings of perivascular infiltrates of lymphocytes, histiocytes, eosinophils and neutrophils and the probable association with Gam-COVID-Vac vaccine. Intravenous (IV) hydration and nutritional support were started. Coronary angiogram revealed involvement of the left anterior descending artery. IV ultrasound guided percutaneous transluminal coronary angioplasty (PTCA) with stenting was performed. Cardiac rate controllers, anticoagulants, steroids, and emollients were initiated. Full recovery after three weeks was achieved with resolution of cardiac and dermatological symptoms.

Conclusion: Management of adverse events post vaccination is centered primarily on early recognition for appropriate medical care may be given to attain favorable outcomes. The benefits of vaccination still outweigh the potential harm. ED physicians play a vital role by being vigilant in the recognition and reporting of adverse events.

Thinking differently about cultural safety in the ED: Feasibility of incorporating a first nation's senior health worker into the multidisciplinary team

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Introduction: Increasing the cultural capability of Emergency Departments (EDs) may improve the experiences and outcomes of First Nations patients. Diploma qualified First Nations Health Workers are integral to good health outcomes for First Nations patients in primary healthcare. The feasibility of incorporating First Nations Health Workers in the ED setting is unknown.

Description: We incorporated a First Nations Senior Health Worker (SHW) into the multidisciplinary team at the RBWH ED. They were to provide direct and immediate, culturally sensitive, clinical support to First Nations ED patients and to role model culturally sensitive behaviors for ED clinicians. To evaluate feasibility, we assessed the time, resources and cost of establishing and recruiting into the position, methods of patient referral to the SHW, demand, and integration with existing First Nations support services.

Outcomes: The SHW role was collaboratively developed by senior ED leadership and education teams. The role was advertised across platforms including Smartjobs, SEEK and Facebook. A 8 applications were received, and three people were interviewed. Employment commenced in December 2021. The role was quickly incorporated into the multidisciplinary team and is earning appreciation throughout the medical and nursing ranks.

Conclusions: It is feasible to incorporate a SHW into a large Queensland ED. The SHW role has been embraced by our staff and the hospital and community services more broadly. Anecdotally, the role has led to improved patient experiences and further results about the effects of the SHW on quality of care will be provided in due course.
Surviving deadly sea wasp, at home

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Introduction: Chironex is a genus of box jellyfish. Their stings are highly venomous and known to cause fatalities. Early intervention to jellyfish sting wound, even with non-pharmaceutical remedies helps in recovery and avoids unwanted serious complications.

Description: An 11-year-old boy presented to our Emergency Department with jellyfish sting. He recalls intense pain sustained on his right forearm which progressed into swelling. His father immediately applied some vinegar and a mix of dried chilli and hibiscus flower.

Outcomes: The boy came to hospital 22 h later, due to swelling over the sting area. No pain, numbness, or weakness. Right arm examination revealed jellyfish sting area <2% TBSA with mild swelling and erythema, however non tender with full range of motion. Nematocyst sampling taken was suggestive of Chironex species. He was given IV Hydrocortisone and discharged after three hours observation.

Conclusions: Clinical manifestations of Chironex sp. envenomation includes local reaction, and more serious systemic manifestations leading to cardiovascular collapse and death within minutes. Children seem to be more vulnerable. These can be avoided just by using home remedies.

A recent study found that treating the stinging organelles of Chironex fleckeri that has already been discharged, with vinegar could increase venom release by 70%. Vinegar nevertheless remains the treatment of choice as recommended by the Australian Resuscitation Council. This case reported here proved that applying vinegar is still relevant. The action of capsaicin, an active component of chilli peppers, which causes defunctionalisation of nociceptor fibers, is believed to help in pain relief.

Figures show flat, dark purple coloration of the skin developed where the jellyfish tentacles had contacted the skin (Left), Nematocyst sampling suggestive of Chironex sp. (Right)

References:
1. Cegolon L, Heymann WC, Lange JH, Mastrangelo G. Jellyfish stings and their management: a review. Mar Drugs. 2013;11(2):523–50.
2. Welfare P, Little M, Pereira P, Seymour J. An in-vitro examination of the effect of vinegar on discharged nematocysts of Chironex fleckeri. Diving Hyperb Med. 2014;44(1):30–4.
3. Australian Resuscitation Council. Guideline 9.5.6, Envenomation - Jellyfish stings2010:[1 - 5 pp.].
4. Anand P, Bley K. Topical capsaicin for pain management: therapeutic potential and mechanisms of action of the new high-concentration capsaicin 8% patch. Br J Anesth. 2011;107(4):490–502.

Multidisciplinary simulation–Learning together to work together

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Introduction: In 2021 education within Wyong Hospital Emergency Department (ED) began to evolve with the inclusion of nursing staff and paramedics. The multidisciplinary team (MDT) approach enabled teams to transform from silo learning, to MDT learning.

Description: In 2019, NSW Ambulance introduced mechanical CPR which led to medical, nursing and paramedic staff working together to simulate safe and effective transfer of care. This was the catalyst for ongoing monthly MDT simulation education. This model involved a lecture style pre-brief education session followed by a series of live video streamed simulated cases. During the simulations, paramedics provided a pre-notification call arrived at the ED and transfer of care.
Wood splitter-related upper limb injuries: A case series from a single center

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Background: Accidents during wood splitting can cause various injuries, including fractures, amputations, and tissue damage to the upper limbs. Hand injuries specifically affect the social and economic life of the patient due to loss of function and the need for long-term rehabilitation. Although upper limb injuries related to wood splitting are not uncommon, epidemiological reports from Japan remain lacking.

Objective: The aim of this study was to clarify the clinical characteristics of this injury, to facilitate the development of preventive measures.

Method: This case series from a single center included patients who visited the emergency department at Hirosaki University Hospital from April 2015 to November 2021. Our patient database was used to identify those patients with upper limb injuries in which the mechanism of injury was related to wood splitters.

Results: We identified 17 cases during the study period. Among these, 14 cases occurred at home or on a farm belonging to the patient. No injuries were due to industrial accidents. Injuries to the index finger were the most common, in 9 cases, followed by the thumb in 5 cases. Six patients underwent replantation surgery, and the replant survival rate was 80%. Median duration from the first to last hospital visits was 121 days.

Conclusion: The most common wood splitter-related injuries were to the thumb and index finger, which are functionally important digits. All injuries were sustained during non-occupational use of a wood splitter. One preventive measure is to educate people on the safe use of wood splitters.

Lessons in leading change: Transforming an emergency department in Vanuatu—a personal story

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Introduction/Background: In 2019 I commenced as Vanuatu’s first full time Emergency Physician, to help develop emergency care systems and build local staff capacity in what was then an under-developed, disorganized emergency unit.

Objective: This is a personal account of how change was introduced to develop a new emergency department (ED) in Vanuatu.

Description: The journey to build a fully functional ED involved constant advocacy for training, upskilling staff, and introducing incremental changes. Against the backdrop of severe resource constraints and competing priorities for the health budget many options were utilized to make the necessary gains.

Outcomes: Local staff could visualize what changes they wanted for better patient care and their own development, but lacked a leader and advocate to help them mobilize the required resources to realize their dreams. By being that leader, establishing systems and process for better outcomes, mentoring, and supporting the local staff, we were able to make great gains very quickly.

Essential to the rate of development and change was the engagement and assistance of my professional colleagues ACEM, AVI, DFAT (Aust) and MFAT (NZ). The recruitment of AVI volunteer doctors and nurses helped build and sustain a new culture of emergency care.

Conclusion: By supporting the locals in their vision for better patient outcomes in emergency care, this example demonstrates how strong leadership and harnessing good will in the wider global EC community can help achieve positive goals towards transformative change.

Spontaneous pneumothorax and bullous lung formation as a late complication of COVID-19 pneumonia

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Introduction: Spontaneous pneumothorax is a rare complication of COVID-19 pneumonia1. Pneumothorax in
the setting of COVID-19 is commonly due to complications of barotrauma during mechanical ventilation. However, diffuse alveolar damage in COVID-19 pneumonia may lead to development of bullous lung disease later in the disease.1 We report an uncommon case of a patient with post-COVID-19 pneumonia presenting with spontaneous pneumothorax.

Description: A 49-year-old male with a history of COVID-19 pneumonia stage 4 complicated with organizing pneumonia a month prior, presented to the ED for sudden acute onset of dyspnea, hemoptysis, and persistent cough. He had co-morbid hypertension, dyslipidemia, and previous history of stroke. Upon arrival, he was hypoxic requiring oxygen supplementation, tachypneic and tachycardic. He was otherwise normotensive with a central trachea. Clinical examination revealed reduce air entry over the left lung with presence of subcutaneous emphysema. CXR confirmed the findings of a left pneumothorax. ECG showed no ischemic changes. A chest tube was subsequently inserted for decompression.

Outcomes: CTPA/HRCT Thorax showed findings of bilateral bullae formation along with minimal left pneumothorax. There was no evidence of pulmonary embolism. Chest tube was kept for drainage until lung re-expansion. He was discharged well with respiratory follow-up.

Conclusions: In a patient with a previous history of COVID-19 presenting with sudden onset or worsening shortness of breath, besides suspecting pulmonary embolism and myocardial infarction, the emergency clinician needs to recognize the possibility of spontaneous pneumothorax in this group of patients. A potential warning sign is a history of persistent coughing.

Reference:
1. Schiller, M., Wunsch, A., Fisahn, J., Gschwendtner, A., Huebner, U., & Kick, W. (2021). Pneumothorax with Bullous Lesions as a Late Complication of Covid-19 Pneumonia: A Report on Two Clinical Cases. The Journal of Emergency Medicine, 61(5), 581–586.

A platform for innovation: Using human factors tools to transform care delivery in the emergency department

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Background: Emergency Departments (EDs) are highly complex and dynamic healthcare settings. Models of care (MoC) define the delivery of care in ED, outlining best practice for a person, population, or patient cohort as they progress through the ED. Recent challenges to resources have amplified the need for a means to develop localized, patient centric, evidence based MoC. Human factors tools offer a platform for the development and implementation of evidence based sustainable innovations in MoC.

Objectives: This study used the Functional Resonance Analysis Method (FRAM) and Cognitive Work Analysis (CWA) to create models for developing innovations in care delivery.

Methods: Using FRAM, maps were developed to explore work processes. Then models were developed from the CWA framework to explore in detail the who, what, where, when, and how of work performed in ED.

Results: FRAM models identified key leverage points in work processes for potential areas for innovations in care delivery. The CWA framework models identified high level solution designs that could be implemented within workplace constraints, potential modifications (e.g., multiple communication pathways) and impediments (e.g., IT system speed and maintenance practices) to improve the delivery of safe and timely care.

Conclusions: Innovation in highly complex and resilient systems like ED requires using tools that account for complexity and adaptation. Using FRAM and the CWA framework, high level solutions and new MoC can be generated that consider the contextual information of the wider system. These models can be used to design and test innovations for better care delivery in ED.

The forbidden fruit—Jatropha seed poisoning in a 9-year old female: A case report

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Background: Jatropha curcas commonly known locally as Tubang-bakod or tuba-tuba is a plant that is widespread in the Philippines. It is found along roadsides and grown as hedges or living fences. Jatropha are fruit bearing with seeds that have a pleasant taste. Despite its use in traditional medicine, the seeds contain toxic substances. The plants are particularly attractive to children, making them more susceptible to Jathropha poisoning.

Objectives: The objectives of this case were to describe the clinical presentation and discuss the management of Jatropha poisoning in children.

Methods: This is a case of a 9-year old female who came into the Emergency Department complaining of vomiting and abdominal pain after ingesting Jatropha seeds. She was managed with IV fluid hydration and with resolution of her symptoms, was subsequently discharged after twelve hours of monitoring.

Conclusions: There is no antidote hence the cornerstone for management is supportive and symptomatic. Patients with acute poisoning often recover within 24 h with prompt management. Since Jatropha is a very common plant and is widely used as traditional medication, poisoning due to its accidental consumption is underreported, hence, it is...
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cial to conduct more local studies regarding its poi
sonous effects. The data gathered from these studies should be disseminated to help foster awareness so as to reduce accidental poisoning in the communities.

Serum levels of S100B are significantly correlated with injury severity

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Background: Severe traumatic injury is a leading cause of death in young adults worldwide, resulting in more than 14,000 deaths per day.1,2 Because of this, research has focused on the identification of suitable biomarkers to facilitate appropriate treatments in the Emergency Department (ED). A 3 S100B is a favorable biomarker for traumatic brain injury (TBI), however, recent studies have shown its expression in many extracranial tissues.4–7 This raised the question as to whether serum levels of S100B correlate with overall injury severity.3 If so, its use as an adjunct in trauma management could be explored.

Objectives: To investigate whether serum levels of S100B correlate with overall injury severity using the injury severity scoring system (ISS).

Method: Trauma patients were recruited from ED. Serum samples (8ml) were drawn at time of study enrolment and stored at −80°C until analyzed. Regional Abbreviated Injury Scale (AIS) scores were used to compute an overall ISS for each patient. Pearson’s correlation was used to examine the relationship between S100B (μg/L) and ISS.

Results: In our cohort of patients (n = 44), injuries ranged from isolated TBI (n = 9), isolated fracture (n = 5), multiple trauma (n = 20), and healthy controls (n = 10). Serum levels of S100B (μg/L) were significantly correlated with injury severity scores (p = 0.0001, r = 0.54).

Conclusion: Our findings indicate that S100B may have utility as a diagnostic tool. Future studies should investigate its usefulness as a predictive biomarker for outcomes including hospital length of stay, intervention requirement, and mortality.

Table 1. Illustrating patient demographics

|                | n = 44 |
|----------------|--------|
| Sex: n = male/female (%) | 27/17 (61.4/38.6 %) |
| Median age (years) | 50 (19–93) |
| Injury            |        |
| Multiple trauma   | n = 20 |
| Isolated TBI      | n = 9  |
| Isolated fracture | n = 5  |
| Healthy controls  | n = 10 |
| Injury Severity Score (median) | 10.5 (0–41) |
| S100B μg/L (median) | 0.26 (0.03–1.35) |

References:
1. Ritchie H, Roser M. Causes of death. Our world in data. 2018.
2. Organization WH. Injuries and Violence: the facts 2014. 2014.
3. Muller M, Munster JM, Hautz WE, Gerber JL, Scheffold JC, Exadaktylos AK, Pfortmueller CA. Increased S-100 B levels are associated with fractures and soft tissue injury in multiple trauma patients. Injury. 2020;51(4):812–2.
4. Undén I, Calcagnile O, Undén J, Reinstrup P, Bazarian J. Validation of the Scandinavian guidelines for initial management of minimal, mild, and moderate traumatic brain injury in adults. BMC medicine. 2015;13(1):1–9.
5. Gonçalves CA, Leite MC, Guerra MC. Adipocytes as an important source of serum S100B and possible roles of this protein in adipose tissue. Cardiovascular psychiatry and neurology. 2010;2010.
6. Stefansson K, Wollmann R, Moore B, Arnason B. S-100 protein in human chondrocytes. Nature. 1982;295(5844):63–4.
7. Cocchia D, Michetti F, Donato R. Immunocytochemical and immunocytochemical localization of S-100 antigen in normal human skin. Nature. 1981;294(5836):85–7.

A perimortem cesarean section on an out-of-hospital cardiac arrested 28-year old primigravida at 35 4/7 weeks age of gestation

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Unraveling the chaotic flow: A novel ultrasound finding in superior vena cava syndrome

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Introduction: Superior Vena Cava (SVC) Syndrome is a constellation of signs and symptoms secondary to obstruction of SVC drainage and the resultant increase in venous pressure of its tributaries upstream1. SVC Syndrome is usually attributable to a malignancy. Diagnosis is made via a computed tomography (CT) scan. SVC ultrasound is difficult due to overlying bony structures and the air-filled lung2. We report a novel ultrasound finding that may possibly be utilized in diagnosing SVC Syndrome.

Description: A 65-year-old hypertensive, diabetic female came into the Emergency Department (ED) because of progressive dyspnea. This was associated with cough and easy fatigability with no fever, chest pain or weight loss. Assessment at another hospital revealed pneumonia and new-onset facial swelling. She had no improvement with prescribed medications prompting consultation at our ED. Vital signs were stable upon arrival, but oxygen saturation was 93%. Point-of-Care Ultrasound (POCUS) evaluation revealed no venous thromboses with unremarkable abdominal, lung and cardiac findings. Both internal jugular veins however were distended and non-compressible and had bidirectional blood flow exhibiting the “Yin-Yang” sign on color doppler.

Outcomes: POCUS findings led to confirmatory chest contrast CT which showed a mass encasing the right main bronchus. CT-guided biopsy revealed small cell carcinoma. Patient was discharged improved after subsequent radiotherapy sessions.

Conclusions: Our case report highlights the potential use of POCUS in diagnosing SVC Syndrome. Our acquired image of the bilateral distended internal jugular veins revealed bi-directional flow exhibiting the Yin-Yang sign, which has not been documented or previously reported elsewhere in literature.

References:
1. Lacout A, Marcy P, Thariat J, Lacombe P, Hajjam M: Radio-anatomy of the superior vena cava syndrome and therapeutic orientations. Diagnostic and Interventional Imaging 2012; 93(7): 569–577
2. Birch A, Um D, Laselle B: Ultrasound Detection of Superior Vena Cava Thrombus. Western Journal of Emergency Medicine 2014; 15(6): 715–718
factors were younger age, lack of driving experience, time-pressured work, and inadequate protective gear.

Conclusions: There are very few publications describing FDR injuries and risk factors. This is an emerging industry in which the worker population is younger and more vulnerable. Given different legal and cultural contexts across different countries, Australian-specific research is required.

DINED (Delivery-related INJuries in the ED)
Part 2: A chart review of risk factors and injuries affecting food delivery riders

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Background: With the rapid rise in popularity of food delivery in Australia, there has been an associated anecdotal rise in the number of injuries to the food delivery riders (FDRs). Little is known about this vulnerable patient cohort.

Objectives: Examine patterns of injury, the impact of these injuries, and identification of potentially modifiable contributing factors through industry regulation reforms and education.

Method: FDR related presentations to the Royal Brisbane and Women’s Hospital Emergency Trauma Center were identified over a year. Data included patient and incident demographics: time, type, and location of injuries, investigations and care required, length of stay, admission requirements and follow up.

Results: The cohort was 81.8% male with a mean age of 25.2 years. Most injuries occurred from a collision with a vehicle. The most common injury was fractures. Incidence increased on weekends and during the evening. Over half the cohort were admitted to hospital. Only 22.7% of patients were eligible for workers compensation and less than half were covered by Medicare. The majority (72.7%) of cases involved non-resident riders from other countries.

Conclusion: The majority of FDRs presenting with injuries are not Australian citizens and less than half were Medicare eligible potentially contributing to inadequate access to care especially fracture follow up. There were spikes in injuries occurring at night, weekends and during periods of pandemic associated lockdowns demonstrating an increased usage of delivery services during these times. Results highlight injury patterns experienced by delivery riders and potentially modifiable risk factors for this rapidly growing area of employment within the gig economy.

“HELP! MY ABDOMEN HURT”: Case of small bowel perforation due to blunt trauma

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Introduction: Blunt small bowel injury (SBI) is rare, thus timely diagnosis may be difficult. The low incidence of the injury can result in delayed surgical interventions. We describe a case of blunt trauma with delayed onset of symptoms, sustained hollow organ perforation who managed to undergo early surgical intervention.

Description: A 20-year-old lady presented with lower abdominal pain and vomiting 12 h post motor vehicle accident (MVA). She was in pain with blood pressure 96/58 mmHg and tachycardic 104 bpm. There was seat belt sign and tenderness over the lower quadrant region. FAST revealed free fluid over the pouch of Douglas and perisplenic area. CXR showed bilateral air under diaphragm and CT abdomen found generalized pneumoperitoneum with moderate intra-abdominal free fluid and small bowel thickening measures 0.6 cm. Patient underwent exploratory laparotomy with small bowel resection with double barrel stoma. Intraoperatively there was gross contamination with 500cc pus and small bowel perforation measuring 1 cm. She was discharged 3 days later with antibiotic.

Outcomes: MVA is the main cause of blunt SBI. A ‘seat belt sign’ and ongoing abdominal pain are known associated risk factors. It ranges from seatbelt sign to intra-abdominal injuries and vertebral fractures. If the injury is severe, peritonitis develops immediately and may ease the diagnosis. The diagnosis may be challenging in case of mild injury such as small bowel perforation or mesenteric laceration.

Conclusions: Managing blunt abdominal trauma requires a high index of suspicion of visceral perforation even with minimal clinical findings. Early involvement of the respective teams may expedite the intervention and result in a better outcome.

Critical incident reporting system in laboratory animal science—Active participation on CIRS—LAS improves quality of preclinical studies and animal welfare

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Background: Preclinical studies are important to gain new knowledge in the field of emergency medicine. Animal experiments are often used to validate new therapeutic approaches. The use of laboratory animals is indispensable in this field of complex physiological research models and at the same time represents a great risk for the animals. In addition, the repetition of animal experiments is time-consuming and cost-intensive.
Objectives: In preclinical trials, there are often a large number of animals that die unexpectedly or show an unexpected clinical course. These results and transparent handling of these unforeseen and critical events are enormously important.

Method: The CIRS-LAS portal offers the possibility for everyone working with laboratory animals to deal with these events transparently and openly, without fear of consequences. On CIRS-LAS.de, critical incidents can be entered anonymously if desired. A database offers the possibility to search for further cases concerning one’s own work. The database search as well as the exchange about the cases is reserved for registered users. This ensures a safe environment to discuss errors or critical events that may occur in preclinical trials, especially with large animals.

Results: Use of CIRS-LAS.de leads to an exchange of experiences - so everyone can learn from each other and for example, failed trials are not repeated. The exchange and open discussion contribute to safe and successful preclinical studies.

Conclusion: By actively contributing to CIRS-LAS.de, everyone involved in animal experimentation can make a contribution to more animal welfare, fewer laboratory animals, and a transparent approach to animal experimentation in emergency medicine!

Aging in prison in the time of COVID-19

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Background: In the US, the population of older adults in prison has tripled since 1990, leading to the “gray wave” aging crisis, overwhelming a system that has historically been overcrowded and underprepared.1–11 Cases of COVID-19 reported at 5.5 times higher rates in prisons compared to the general population.12–14 The predicted death rates have been examined to be 3 times higher.14 No studies have yet to examine actual death rates in prisons pre and during the COVID-19 pandemic.

Objectives: To discern whether there was an appreciable rise in death rates in 2020 compared to 2019 among older, incarcerated individuals.

Method: Using Illinois Department of Corrections data sets–mortality rates overall, age specific mortality, sex specific mortality, race specific mortality and COVID specific mortality were calculated and compared between 2019 and 2020. Results: Mortality rates in IL prisons increased from 2 deaths per 1000 inmates to 6 per 1000 inmates from 2019 to 2020. 40.7% of deaths in 2020 are attributed to COVID-19. Risk of dying in older prisoner compared to younger is 13.45, (95% CI is 9.71–18.63 p < .001). The relative risk of dying of COVID-19 for older prisoners compared to younger is 1.74 (CI 1.07–2.84. p = .03). The risk ratio for older inmates with COVID related death is 23.4 (CI 13.0–42.2, p < .001).

Conclusion: Due to a combination of risk factors experienced by incarcerated individuals, older adults in prison are not only is more susceptible to COVID-19, but experiences a more severe form of disease with a higher risk of mortality exemplified by higher death rates in the population.

References:
1. Williams BA, Goodwin JS, Baillargeon J, Ahalt C, Walter LC. Addressing the aging crisis in U.S. criminal justice health care. J Am Geriatr Soc. 2012 Jun;60(6):1150–6.
2. Prost SG, Archuleta AJ, Golder S. Older adults incarcerated in state prison: health and quality of life disparities between age cohorts. Aging Ment Health. 2021 Feb;25(2):260–8.
3. Ahalt C, Trestman RL, Rich JD, Greifinger RB, Williams BA. Paying the Price: The Pressing Need for Quality, Cost and Outcomes Data to Improve Correctional Healthcare for Older Prisoners. J Am Geriatr Soc. 2013 Nov;61(11):2013–9.
4. Binswanger IA, Krueger PM, Steiner JF. Prevalence of chronic medical conditions among jail and prison inmates in the USA compared with the general population. J Epidemiol Community Health. 2009 Nov;63(11):912–9.
5. Romano CA, Ravagnani L, Convertini A, Dassisti L, Fanizza AR, Misceo F, et al. The aging process in prisons: pathologies and health conditions in old inmates. An epidemiological research in Italy. Clin Ter. 2020 Aug;171(4):e340–5.
6. Gates ML, Hunter EG, Dicks V, Jessa PN, Walker V, Yoo W. Multimorbidity patterns and associations with functional limitations among an aging population in prison. Arch Gerontol Geriatr. 2018 Aug;77:115–23.
7. Greene M, Ahalt C, Stijacic-Cenzer I, Metzger L, Williams B. Older adults in jail: high rates and early onset of geriatric conditions. Health Justice. 2018 Feb 17;6(1):3.
8. Daza S, Palloni A, Jones J. The Consequences of Incarceration for Mortality in the United States. Demography. 2020 Apr;57(2):577–98.
9. Skarupski KA, Gross A, Schrack JA, Deal JA, Eber GB. The Health of America’s Aging Prison Population. Epidemiol Rev. 2018 Jun 1;40(1):157–65.
10. Munday D, Leaman J, O’Moore E, Plugg E. The prevalence of non-communicable disease in older people in prison: a systematic review and meta-analysis. Age Aging. 2019 Mar 1;48(2):204–12.
11. Leibowitz AI, Siedner MJ, Tsai AC, Mohareb AM. Association Between Prison Crowding and COVID-19 Incidence Rates in Massachusetts Prisons, April 2020-January 2021. JAMA Intern Med. 2021 Oct 1;181(10):1315–21.
12. Gavín W, Campbell E, Zaidi S-A, Gavín N, Dbeibo L, Beeler C, et al. Clinical characteristics, outcomes and prognosticators in adult patients hospitalized with COVID-19. Am J Infect Control. 2021 Feb;49(2):158–65.
Pneumoperitoneum mimics: A rare and benign case of pneumatosis cystoides intestinalis (PCI)

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Introduction: PCI is a rare disease which is described as multiple gas-filled cysts in the intestinal submucosa and serosa1. PCI has a wide-range of etiologies including autoimmune-related causes1. The cysts are commonly located in the terminal ileum1. Ruptured air-filled cysts may lead to radiographic findings of pneumoperitoneum, posing a challenge for clinicians2. We present a case of an immunosuppressed patient presenting with PCI which was treated conservatively successfully.

Description: A 52-year-old bedbound lady with a history of Bickerstaff Brainstem Encephalitis on long-term steroids presented to the ED with generalized colicky abdominal pain for one day. She was able to pass flatus, had regular bowel movements and tolerating her nasogastric feeding as usual. She did not appear septic. Clinical examination revealed a distended abdomen with generalized tenderness and active bowel sounds. An abdominal x-ray revealed multiple intra-luminal gas pockets in both small and large bowels and pneumoperitoneum. A CECT abdomen confirmed the findings of PCI characterized by loculated intramural gas involving the terminal ileum and large bowels with pneumoperitoneum. There was no evidence of bowel ischemia or obstruction.

Outcomes: She was admitted and treated conservatively with intravenous antibiotics, analgesia and discharged well. We postulate that gastrointestinal dysfunction in neuroinflammatory and autoimmune diseases may play a role in the development of PCI.

Conclusions: PCI is often benign and can be safely managed conservatively with close surveillance3. However, clinicians would need to be highly suspicious of a patient with PCI with intractable pain suggesting a true viscous perforation instead requiring urgent surgical exploration.

References:
1. Wang, Y. J., Wang, Y. M., Zheng, Y. M., Jiang, H. Q., & Zhang, J. (2018). Pneumatosis cystoides intestinalis: six case reports and a review of the literature. BMC Gastroenterology, 18(1), 100.
2. Devgun, P., & Hassan, H. (2013). Pneumatosis cystoides intestinalis: a rare benign cause of pneumoperitoneum. Case Reports in Radiology, 2013, 353245.
3. Wu, L. L., Yang, Y. S., Dou, Y., & Liu, Q. S. (2013). A systematic analysis of pneumatosis cystoides intestinalis. World Journal of Gastroenterology, 19(30), 4973–4978.

Developing emergency care capacity in Papua New Guinea: Using digital learning to support effective triage, flow, and data management

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Introduction: Since 2020, the Australasian College for Emergency Medicine (ACEM) has been supporting emergency care (EC) colleagues in Papua New Guinea (PNG) to implement new models of care at ANGAU Memorial Hospital and Port Moresby General Hospital emergency departments. This has involved consideration of the systems, human resources, governance, and data management arrangements necessary to deliver safe and effective EC in a resource-constrained context.

Description: Following consultation with local stakeholders, the Integrated Interagency Triage Tool (IITT) was identified as the most appropriate triage instrument for the departments. The IITT is a three-tier, color-coded triage tool purpose-designed for low-resource settings and has been released as part of a World Health Organization COVID-19 toolkit.

Pandemic travel restrictions limited the ability to deliver face-to-face training in triage and patient flow systems, so a digital learning program was developed to facilitate the change management process. To develop course content, regular meetings between the ACEM and PNG teams were held via video conference. After roll-out of the digital learning program, the new triage and flow model was implemented at both EDs.

Outcomes: Over 90 PNG EC clinicians have completed the digital learning program. Feedback has been overwhelmingly positive, and data shows improved knowledge and confidence among staff. The IITT is performing well at both sites, supported by a custom-designed data management system to facilitate performance monitoring and surveillance.

Conclusions: This collaborative program has demonstrated the feasibility of web-based learning technologies to develop and deliver health professional education in cross-cultural, resource-constrained settings.
Organophosphate poisoning and an atypical intermediate syndrome: A successful case of prolonged intubation in a low-resource newly developed intensive care unit in Rural Zambia

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Introduction: Organophosphate poisoning is a common, under-reported cause of attempted and completed suicide worldwide.1 Following resolution of the acute cholinergic syndrome (muscarinic, nicotinic and central-nervous system effects) patients may develop respiratory muscle and proximal-limb weakness, known as Intermediate Syndrome (IMS).2

Description: We present a 30-year-old Zambian man who was brought to our rural hospital unconscious, in extremis, due to Organophosphate self-ingestion. He was resuscitated with 70-milligrams of atropine, an adrenalin infusion and was intubated. He developed status epilepticus, aspiration pneumonitis and had copious secretions. With an atropine infusion, antiepileptics, fluids and nasogastric electrolyte replacement, his symptoms lessened and he was extubated. A 96-h post-ingestion he developed global-paralysis with persistent fasciculations and muscarinic symptoms (atypical manifestations of IMS) and was reintubated for respiratory failure. He had slow ascending resolution of his paralysis. He was extubated onto non-invasive ventilation on day-12 for 7-h, but required intubation for a further 4-days before a successful extubation and discharge home.

Outcomes: He was mechanically ventilated for 15-days in total, which provided ample opportunity for training local doctors, nurses, and physiotherapists, particularly in preventing complications and troubleshooting ventilation issues. This atypical presentation, with persistent muscarinic symptoms, fasciculations and distal-limb paralysis, contributes to our understanding of IMS.2

Conclusions: Limited treatment options, lack of electrolyte and blood-gas results, electrocardiograms, invasive monitoring, or imaging, with regular electricity and oxygen disruptions made this an ambitious and challenging endeavor. Deciding to intubate in this low-resource setting is fraught with difficulties; however, in patients who unequivocally require intubation, measures can be taken to mitigate risk and achieve successful outcomes.

References:
1. Boedeker, W., Watts, M., Clausing, P. et al. The global distribution of acute unintentional pesticide poisoning: estimations based on a systematic review. BMC Public Health 20, 1875 (2020).
2. Karalliedde, L., Baker, D. & Marrs, T.C. Organophosphate-Induced Intermediate Syndrome. Toxicol Rev 25, 1–14 (2006).

Establishing inter-disciplinary education between medical and paramedic students in Australia

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Introduction: Inter-disciplinary education (IPE) is crucial to the training Doctor1. Globally, qualified practice necessitates teamwork between varied health professionals, however IPE with pre-hospital clinicians has not yet been fully established.

Description: This year, The University of Notre Dame medical school’s annual rural trauma week (RTW) collaborated with local paramedic educators to deliver an educational intervention concerning trauma care. Activities included lectures, interactive case-based discussions, simulations, and panel discussions. Paramedic students participated alongside medical students throughout the week’s activities, which were delivered in a blended in-person and zoom format.

Outcomes: Post-intervention survey feedback was overwhelmingly positive, with over 90% of respondents reporting their appreciation of the longitudinal patient journey had improved, they had increased regard for the other profession, and a greater understanding of the role, skills, and responsibilities of their peers.

Students stated the use of mixed profession teams enabled “shared learning which filled in knowledge gaps” and the ability to “critically reason management choices”. Participants also commented on a “great insight into the role of [the profession] and the relationship between them and us”. This appreciation was commented on as being “essential to our learning as future clinicians”. Participants commented that the “partnership between both professions was strengthened” by participating in rural trauma week.

Conclusions: This is the first time a collaborative curriculum activity between medical students and paramedic students/educators has been delivered within Australia2. The week was a tremendous success. We plan on continuing to deliver IPE between medical and paramedic students.

References:
1. World Health Organization. (2010). Framework for action on interprofessional education and collaborative practice. World Health Organization.
2. McManamny T, Jennings PA, Boyd L, Sheen J, Lowthian JA. Paramedic involvement in health education within metropolitan, rural and remote Australia: a narrative review of the literature. Aust Health Rev. 2020 Feb;44(1):114–120.
Using machine learning to predict survival in children with Ebola Virus disease

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Background: Ebola Virus Disease (EVD) causes high case fatality rates in young children, yet there are limited data focusing on predicting mortality among this vulnerable population.

Objectives: This study aims to develop machine learning-derived prognostic models to predict clinical outcomes in children infected with EVD.

Method: Using retrospective data from the West African EVD outbreak in 2014–2016, elastic net regularization methods were applied to derive an EVD Prognosis in Children (EPiC) predictive model. EPiC was externally validated with data from the 2018–2020 Democratic Republic of the Congo (DRC) outbreak and then updated using serum biomarkers that were found to be significantly correlated with adverse outcome by Spearman’s risk correlation coefficient.

Results: Pediatric EVD mortality was significantly associated with younger age, lower PCR cycle threshold values, unexplained bleeding, breathlessness, bone/muscle pain, anorexia, dysphagia, and diarrhea and included in the EPiC model. The area under the receiver operating characteristic curve (AUC) for EPiC was 0.77 (95% CI: 0.74–0.81) in the West Africa derivation dataset and 0.76 (95% CI: 0.64–0.88) in the DRC validation dataset. Updating the model with aspartate aminotransferase or creatinine kinase increased the AUC to 0.90 (95% CI: 0.77–1.00) and 0.87 (95% CI: 0.74–1.00), respectively.

Conclusion: When predicting mortality in children with EVD, EPiC showed similar performance on the derivation and validation datasets and had better performance when including routinely available biochemical markers. Such a model could potentially inform clinical practice by allowing clinicians to assess pediatric patients at risk for death and help to allocate resources accordingly.

Introduction: Uremia is a syndrome that is associated with fluid, electrolyte and hormonal derangements that develop in parallel with deterioration of renal function. A rare complication of uremia is acute vision loss. Blindness in a Chronic Kidney Disease (CKD) patient presents the emergency physician with a diagnostic conundrum, in which a uremic versus an ischemic cause of the vision loss should be quickly identified.

Description: We report a case of a 57-year-old male with CKD, not on hemodialysis, who presented to the Emergency Department (ED) with acute onset bilateral vision loss. Vital signs were normal upon arrival. The neurologic examination revealed pupils that were non-reactive to light, however cup-to-disk ratio and intraocular pressure were normal. Creatine was 8.98 mg/dl. Cranial Magnetic Resonance Imaging revealed normal findings with angiography demonstrating normal vessel filling. A decision to initiate hemodialysis was done to correct the uremia, which at the time was the postulated cause of the vision loss. Steroid was later added to the treatment.

Conclusions: Acute vision loss in CKD patients is a diagnostic dilemma. Our case demonstrates that even with a classic presentation of uremic optic neuropathy, emergency physicians should have a high index of suspicion for an ischemic cause of the vision loss.

Dengue fever presenting with dysarthria and hypokalemic paralysis

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Introduction: Dengue is an endemic disease with 70% of its global burden concentrated in the Asian region. In

References:
1. Winkelmayer W, Eigner M, Berger O, Grisold W, Leithner C. Optic neuropathy in uremia: An interdisciplinary emergency. American Journal of Kidney Diseases. 2001;37(3):e23.1- e23.7.
2. Korzets Z, Zeltzer E, Rathaus M, Manor R, Bernheim J. Uremic Optic Neuropathy. American Journal of Nephrology. 1998;18(3):240–242.
3. Knox D, Hanneken A, Hollows F, Miller N, Schick H, Gonzales W. Uremic Optic Neuropathy. Archives of Ophthalmology. 1988;106(1):50–54.
4. Lee K, Vaitilingam I. Bilateral optic neuropathy—a rare uraemic manifestation of end-stage renal disease. Clinical Kidney Journal. 2011;4(6):455–455.
5. Basri NA, Shaheen FA. Visual Loss in Uremic Patients on Dialysis: A Case Report and Review of Literature. Saudi J Kidney Dis Transpl 2002;13:45–9
2019, the Philippines was among the top four countries that reported higher number of dengue cases in the same period as compared to the previous year. The illness usually presents as fever, severe headache, retro-orbital pain, myalgia, arthralgia, petechial rash but neurologic manifestations including encephalitis, neuromuscular weakness, and speech abnormalities have been less commonly reported. Unusual manifestations of dengue are likely to be encountered more often in regions where the incidence of disease is high resulting in diagnostic confusion.

Description: This case describes a 26-year-old male with a four-day history of fever, slurred speech and bilateral lower extremity weakness presenting with mild confusion, thrombocytopenia, hypokalemia, a positive Dengue serology test and non-enhancing T2W/FLAIR hyperintense foci in the bilateral cerebral white matter on Magnetic Resonance Imaging. Severe dengue was diagnosed based on thrombocytopenia, plasma leakage, liver, and central nervous system involvement. Patient significantly improved after appropriate correction of hypokalemia and thrombocytopenia and was discharged with referral for outpatient speech therapy.

Outcomes: Management of dengue patients with or without neurologic complications focuses on appropriate hydration and prevention of shock as priorities in treatment. Hypokalemia in dengue is reversible with potassium supplementation without long-term complications.

Conclusions: Neurologic manifestations of dengue are less common but early recognition and differentiation from other similar entities favors a good outcome. Hypokalemic paralysis is an important complication in dengue as it is easily reversible with modest correction.

A version of history by an alcoholic presenting with methemoglobinemia

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Introduction: Methemoglobinemia is a blood disorder in which an abnormal amount of methaemoglobin is produced. Under normal circumstances, <1% to 2% of circulating Hb exists as methaemoglobin, higher concentrations are defined as methemoglobinemia. Its presentation is quite rare in India compared to other countries, which makes this case more interesting is that it's not produced by a congenital disorder rather presented by a poison.

Case report

A 28 year old male was brought to ER with A/H/O consumption of insecticide at his residence. Patient was under the influence of alcohol while he consumed the poison. On arrival patient was hemodynamically stable with a Spo2 of 99% [@]. After 30 min of presentation, he had turned blue and was tachypenic. Patient was catheterised—urine color was green, blood sample became dark brown colored, ABG revealed an PaO2 of 40%. Meanwhile patient attenders brought the compound that was consumed and we identified the compound as a paint thinner NOVOLURAN + INDOXACARB. Gastric lavage was done, activated charcoal 60 g stat via RT was administered, INJ. METHYLENE BLUE 100 mg iv was given over 5 mins after 20 mins the dose was repeated. Immediately within few mins cyanosis disappeared and patient was reverted.

Conclusion: Based on our experience gained, we must always evaluate them as a whole and treat them based on the clinical presentation and knowledge rather on the history given by the intoxicated patient or the bystanders. Early identification of signs and symptoms may decrease the mortality rate of such cases.

Sustaining a shared culture of safety: The emergency medicine quality improvement digest

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Introduction: There is increasing emphasis on emergency departments (EDs) analyzing return visits and adverse events through the lens of quality improvement (QI), but there is reluctance to share opportunities for learning and improvement across institutions due to the lack of safe and organized mechanism. To address this gap, we created the Emergency Medicine (EM) QI Digest, a monthly newsletter shared with EDs across the [BLINED] regional area.

Description: Stakeholder engagement identified three goals: (1) share ED adverse events and clinical cases through the lens of QI; (2) learn from QI initiatives in other EDs; and (3) create a community of practice to safely disseminate this knowledge in a more targeted approach than traditional social media. Each organization contributes content for one issue per year: two de-identified clinical cases analyzed through a QI lens employing a Kirkpatrick model to guide readers from reaction to learning and change, one or two QI projects, and the promotion of city-wide mortality & morbidity (M&M) rounds.

Outcomes: The EM QI Digest launched in September 2017. Through 26 issues, we shared 52 clinical cases and 41 QI projects on many topics, including reducing unnecessary tests, promoting medication safety, avoiding diagnostic error, and enhancing ED flow. Site leads across eight academic, community and pediatric EDs distributed the Digest to 700 interprofessional providers, leaders, and trainees. Multiple organizations reported local impacts, from adapting QI initiatives to learning from cases.

Conclusions: The EM QI Digest has successfully broken down traditional institutional siloes and provided a safe and sustainable platform to foster knowledge translation and collaboration to improve patient care, and it can be replicated in other settings.
Management of low back pain in Australian emergency departments for culturally and linguistically diverse populations from 2016 to 2021

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Background: Although low back pain (LBP) ranks the sixth principal reason for visiting emergency departments (EDs) in Australia, ED care for culturally and linguistically diverse (CALD) populations with LBP and the impact of COVID-19 are not yet investigated.

Objectives: To describe CALD status of ED presentations with LBP and to examine care provision for CALD patients from 2016 to 2021.

Method: This retrospective analysis included records for all adults diagnosed with non-serious LBP at three Sydney EDs from January 2016 to October 2021. We compared healthcare use (ambulance transport, imaging referral, opioids, and admission) by CALD status using multivariable logistic regression and between COVID lockdown (27th–41st week) in 2021 and the same period in 2020.

Results: Of 14,642 LBP presentations, 52.7% were born overseas (47.4% in 2020, p < 0.001), 25.2% preferred communicating in other languages, and 8.4% used interpreter service (7.0% in 2020, p < 0.001). Compared with non-CALD patients, the odds of arriving via ambulance were 0.68 times (95%CI: 0.63–0.73) lower in overseas-born patients, while the odds of hospital admission and receiving lumbar imaging were 1.49 times (95%CI: 1.29–1.73) and 1.43 times (95%CI: 1.25–1.64) higher in patients who used interpreter service. No significant difference in opioid use was found. During lockdown, the proportion of patients arriving via ambulance reduced from 39.6% in 2020 to 30.1% in 2021 (RR = 0.76, 95%CI: 0.65–0.89), attributed to significant reductions (RR = 0.72–0.77) within non-CALD patient groups.

Conclusion: This study shows significant differences in care provision in the ED for CALD populations with LBP, who might experience lack of efficiency and English proficiency when communicating with healthcare practitioners. Targeting strategies to prevent over-treatment and standardize care for CALD populations should be considered.

When police are perpetrators

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Introduction: Abuse in Emergency Medicine can take many forms. Patients can often suffer mistreatment at the hands of Police Officers, which frequently goes under-reported, as the victim is unwell and may be unaware of their rights.

Description: These Cases involving Patients from Minority Backgrounds show the trauma Patients are suffering at the Hands of Police.

Outcomes: Case 1: A 35-year-old African female was brought into Hospital for a Mental Health Review after suffering from Domestic Violence. The Police charged her with assaulting her partner and later, she was admitted to the Psychiatric Unit after a suicide attempt.

Case 2: A 73 year old Mandarin Speaking Widower was brought to the Emergency Department in Handcuffs. Police requested a Clearance from the Mental Health Team, so they could charge him for pushing his niece. He stated that she had stolen $80,000 from him. He had signs of Cognitive Impairment and was found to have Acute Cholecystitis.

Case 3: Patient [redacted] was sexually assaulted by her partner, [redacted] but the Police arrested her, after she spat on them, while she was in great distress. She was taken into custody, and despite her father pleading with Police Officers, they did not take the baby into care. [redacted] took her 10-month-old baby and murdered him.

Conclusions: Police Brutality is harming Vulnerable Patients and we can advocate for them, by reporting

| OR (95%CI) | Country of birth | Preferred language | Interpreter service |
|------------|------------------|--------------------|---------------------|
| Ambulance  | 0.68 (0.63, 0.73)*** | 0.82 (0.75, 0.90)*** | 0.98 (0.86, 1.12)   |
| Lumbar imaging | 0.96 (0.88, 1.04) | 1.12 (1.01,1.23)* | 1.43 (1.25, 1.64)*** |
| X-Ray      | 0.97 (0.88, 1.06)  | 1.19 (1.07,1.32)** | 1.52 (1.31, 1.75)***|
| Advanced imaging | 0.93 (0.82, 1.05) | 0.95 (0.82,1.10)  | 1.11 (0.91, 1.36)   |
| Opioid use | 0.97 (0.90, 1.06)  | 0.95 (0.85, 1.05) | 1.06 (0.91, 1.25)   |
| Strong opioids | 1.02 (0.94, 1.11) | 1.02 (0.92, 1.13)  | 1.18 (1.00, 1.38)*  |
| Weak opioids | 0.87 (0.76, 0.99)* | 0.82 (0.70, 0.97)* | 0.76 (0.58, 0.99)*  |
| Hospital admission | 0.96 (0.87, 1.07) | 1.16 (1.04, 1.29)** | 1.49 (1.29, 1.73)*** |

*p<.05; ** p<.01; *** p<.001
these instances, as well as referring patients to Services who can assist. By facing these Abuses of Power, we can ensure change.

References:
1. Hegarty K, Hindmarsh E, Gilles, M. Domestic violence in Australia: definition, prevalence and nature of presentation in clinical practice. The Medical Journal of Australia 2000; 173 (7): 363–36.
2. Mazza M, Marano G, Lai C, Janiri L, Sani G. Danger in danger: Interpersonal violence during COVID-19 quarantine. Psychiatry Research 2020; Jul 289:
3. Alang S, McAlpine DD, Hardeman R. Police Brutality and Mistrust in Medical Institutions. Journal of Racial and Ethnic Health Disparities. 2020; 7: 760–768
4. Alang S, Rogers TB, Williamson, LD, Green C, Bell AJ. Police brutality and unmet need for mental health care. Preventative Medicine Reports 2021; 22

Primary headache drug treatment patterns and determinants in emergency departments across Australia and New Zealand

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Objectives: To describe drug prescribing patterns and determine the predictors of prescribing for primary headache presentations to EDs across Australia and New Zealand.

Method: This study was a secondary analysis of the HEAD (Headache in Emergency Department) study data, which were collected in 2019 across 11 countries. ED patients >18 years with non-traumatic headache were included. The outcome was CT utilization. Serious secondary headache was defined as the composite of subarachnoid hemorrhage, intracranial hemorrhage, meningitis, encephalitis, cerebral abscess, intracranial neoplasm, hydrocephalus, arterial dissection, stroke/TIA, hypertensive crisis, pregnancy-related hypertension/ eclampsia, temporal arteritis, intracranial hypertension, ventriculoperitoneal shunt complications, cerebral venous thrombosis or reversible cerebral vasoconstriction syndrome.

Results: There were 5,293 participants. Median (IQR) age was 40 (29–55) years and 66% were woman. Mean CT utilization was 42.9% (95% CI 34.8%–51.0%) and varied from 15.9% to 75% [Australia 38.9%, Belgium 60.0%, Colombia 49.9%, France 51.8%, Hong Kong 54.7%, Israel 75.0%, New Zealand 41.3%, Romania 15.9%, Singapore 33.0%, Turkey 25.9% and United Kingdom 44.6%]. Mean CT diagnostic yield was 9.8% (95% CI 7.5%–12.0%). Ten SNNOOP10 red flags were available for analysis: fever 2.5%, any neoplasm antiemetic (46% of antiemetics). Triptans (3.0%) were infrequently used. Twenty-four drug combinations including ‘no drugs’ accounted for 90% of the combinations used. Compared with mild headache, patients with severe headache had 4.3 times the odds for receiving chlorpromazine. Compared with symptom duration <1 day, patients with headache for >3 days had 1.4 times the odds for receiving an opioid. The drugs prescribed were also determined by presence of nausea and vomiting, known history of migraine, and medications received prehospital.

Conclusion: An understanding of current treatment patterns and determinants of prescribing could help promote appropriate drug use by reducing overuse, underuse, and misuse.

Computed tomography brain scan utilization in patients with headache presenting to emergency departments: A multi-national study

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Objectives: To compare the observed CT brain utilization with theoretical utilization based on SNNOOP10 red flags for serious headaches in ED patients.

Method: This study was a secondary analysis of the HEAD (Headache in Emergency Department) study data, which were collected in 2019 across 11 countries. ED patients >18 years with non-traumatic headache were included. The outcome was CT utilization. Serious secondary headache was defined as the composite of subarachnoid hemorrhage, intracranial hemorrhage, meningitis, encephalitis, cerebral abscess, intracranial neoplasm, hydrocephalus, arterial dissection, stroke/TIA, hypertensive crisis, pregnancy-related hypertension/eclampsia, temporal arteritis, intracranial hypertension, ventriculoperitoneal shunt complications, cerebral venous thrombosis or reversible cerebral vasoconstriction syndrome.

Results: There were 5,293 participants. Median (IQR) age was 40 (29–55) years and 66% were woman. Mean CT utilization was 42.9% (95% CI 34.8%–51.0%) and varied from 15.9% to 75% [Australia 38.9%, Belgium 60.0%, Colombia 49.9%, France 51.8%, Hong Kong 54.7%, Israel 75.0%, New Zealand 41.3%, Romania 15.9%, Singapore 33.0%, Turkey 25.9% and United Kingdom 44.6%]. Mean CT diagnostic yield was 9.8% (95% CI 7.5%–12.0%). Ten SNNOOP10 red flags were available for analysis: fever 2.5%, any neoplasm

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3.1%, neurological deficit 3.5%, sudden onset 13.2%, age >50 years 31%, exertion 6.5%, papilloedema 0.4%, pregnancy/post-partum 3.6% of women, head trauma within last week 2.6%, and immunosuppression 0.32%. If all patients with <1 red flag were imaged, the theoretical CT utilization would be 48.8%.

**Conclusion:** There were wide international variations in CT utilization for ED headache presentations. The observed mean utilization was lower than a theoretical utilization based on SNNOOP10 red flags.

**Reference:**
1. Do TP, Remmers A, Schytz HW, et al. Red and orange flags for secondary headaches in clinical practice: SNNOOP10 list. Neurology. 2019;92:134–44.

**Outcomes of IMPACT pathway assessment for first nations Australians presenting to an emergency department with suspected acute coronary syndrome**

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**Background:** The Improved Assessment of Chest pain Trial (IMPACT) pathway (1) is an accelerated strategy for the assessment of emergency department (ED) patients presenting with suspected acute coronary syndrome (ACS). Aboriginal and Torres Strait Islander people have higher rates of cardiac events at younger ages than non-indigenous people (2). To date, outcomes for such patients assessed using the IMPACT pathway have not been reported.

**Objectives:** The objective of this study was to report outcomes for Aboriginal and Torres Strait Islander patients investigated using the IMPACT pathway.

**Method:** This prospective observational trial was conducted at Cairns Hospital between November 2017 and December 2019. Aboriginal and Torres Strait Islander people presenting to the ED with suspected ACS were risk stratified and all received inpatient cardiac testing. The primary outcome was ACS within 30-days.

**Results:** In total, 155 participants were classified as either low- (n = 18, 11.6%), intermediate-risk (n = 87, 56.1%), or high- (n = 50, 32.3%) risk of ACS. 30-day ACS occurred in 29 (18.6%) patients, which included 26 (52.0%) high-risk patients and three (3.4%) intermediate-risk patients. All ACS was identified during index presentation. No low-risk patients were diagnosed with ACS within 30-days.

**TABLE 1 – Primary outcome by ACS risk category**

| ACS risk category (IMPACT) | All patients | Low | Intermediate | High |
|---------------------------|-------------|-----|-------------|------|
| n                         | 155         | 18  | 87          | 50   |
| ACS, n (%)                |             |     |             |      |
| At index presentation     | 29 (18.7)   | 0   | 3 (3.4)     | 26 (52.0) |
| Within 30-days (excl. index presentation) | 0 | 0 | 0 | 0 |
| ACS – type of event, n (%)|             |     |             |      |
| TIMI (NSTEMI)             | 26 (16.8)   | 0   | 1 (1.1)     | 25 (50.0) |
| UAP                       | 3 (1.9)     | 0   | 2 (2.3)     | 1 (2.0) |
| Cardiovascular death      | 0           | 0   | 0           | 0    |
| Urgent coronary revascularization | 0 | 0 | 3 (3.4) | 17 (34.0) |

*Patients may have had more than one outcome.

IMPACT: Improved Assessment of Chest Pain Trial (3)
ACS: acute coronary syndrome
TIMI: Type 1 acute myocardial infarction
NSTEMI: Non-ST-segment elevation myocardial infarction
UAP: unstable angina pectoris

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Conclusion: The IMPACT pathway allows two-thirds of emergency department patients of Aboriginal and Torres Strait Islander origin to safely undergo accelerated assessment for ACS. The clinically significant proportion of Aboriginal and Torres Strait Islander patients experiencing cardiac events may indicate the need for opportunistic testing for coronary artery disease.

References:
1. Cullen L, Greenslade J, Hawkins T, Hammett C, O’Kane S, Ryan K, et al. IMProved assessment of chest pain trial (IMPACT): An intervention study of a new accelerated protocol for patients with possible acute coronary syndrome. Med J Aust. 2017;207:195–200.
2. Mathur S ML, Leigh S. Aboriginal and Torres Strait Islander people with coronary heart disease: further perspectives on health status and treatment. Cardiovascular diseases series no. 25. Cat. no. CVD 33. Canberra: Australian Institute of Health and Welfare; 2006.

SURGE-AED: Harmonized clinical data capture for surge events in an Australian emergency department

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Introduction: Disasters, such as epidemic thunderstorm asthma (eTSA), cause serious disruptions to community life and require special mobilization of resources other than those normally available.1 Several strategies have been proposed and trialed to cope with the surge of patients presenting to the emergency department (ED) during such events.2 However, evaluation of these strategies has proven difficult because research is often delayed, incomplete and inconsistent in a disaster setting.3 Bundles of care offer the potential to support the management of a surge of patients presenting to the ED.4 However, validation of acceptability, effectiveness and safety is necessary prior to widespread implementation.

Description: An eTSA bundle of care will be developed and implemented to decrease input, expedite throughput, and increase output of patients presenting to the ED during eTSA disaster. We propose a prospective observational single-centered cohort pilot study to assess the bundle’s acceptability, effectiveness, and safety.

1. Outcomes: Acceptability
   a. Patient and ED staff utilization of the bundle
2. Effectiveness
   a. Decreased patient volume
   b. Decreased time to triage, time to treatment and time to discharge
   c. Complete and consistent EMR documentation
3. Safety
   a. Decreased adverse events and re-presentations to ED within 72 h of initial presentation

Conclusions: This study will assess whether this bundle is acceptable, as determined by both patients and ED staff, effective and safe. These results will be used to optimize the bundle, expand its use to multiple sites, as well as tailor the bundle for other disasters such as bush fires or heatwaves.

References:
1. Emmerson KM, Silver JD, Thatcher M, Wain A, Jones PJ, Dowdy A, Newbiggin EJ, Picking BW, Choi J, Ebert E, Bannister T. Atmospheric modeling of grass pollen rupturing mechanisms for thunderstorm asthma prediction. PloS one. 2021 Apr 14;16(4):e0249488.
2. Nager AL, Khanna K. Emergency department surge: models and practical implications. Journal of Trauma and Acute Care Surgery. 2009 Aug 1;67(2):S96–9.
3. Rojek AM, Martin GE, Horby PW. Compassionate drug (mis) use during pandemics: lessons for COVID-19 from 2009. BMC medicine. 2020 Dec;18(1):1–0.
4. Hatcher, L. R. & Coleman, M. M. (2020). Strategies for Implementation of Care Bundles on a General Care Unit. Pediatric Quality and Safety, 5, e324.

I’m swollen, drowning, and tired! What’s wrong doctor?

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Introduction: Nephrotic syndrome (NS) is relatively rare, however is a known cause for edema. It’s often neglected at the emergency department (ED), and initial workups often focus on ruling out cardiac and hepatic causes. NS is characterized by peripheral edema, heavy proteinuria, hypoalbuminemia and hyperlipidemia. Common differential diagnoses include diabetic nephropathy or minimal change disease. Nevertheless, we must not forget the most uncommon ones, like amyloidosis (that affects several organs, manly kidney, and heart, consequence of abnormal protein deposits).

Description: A previously healthy 52-year-old male presented to the ED with lower limbs edema, shortness of

| TABLE 1. Management of NS in the ED |
|-------------------------------------|
| Thromboprophylaxis (e.g., LMWH) | Blood pressure control |
| Antiplatelets (e.g., ASA) | Monitor kidney function |
| Lipid-lowering agents (e.g., statins) | Watch out for infections |

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breath and asthenia, that started 1 year ago but had been worsening on the last 4 days. On exam, he was hypotensive, tachycardic and in anasarca. The lab test done in the ED showed a severe decrease of albumin and a significant proteinuria. On the chest x-ray there was bilateral pleural edema. After admission to the Nephrology service, most extensive techniques were performed, including a blood marrow and renal biopsy that confirmed the presence of amyloid fibrils. He initially was treated with IV furosemide, losing 25 kg in a month. Later, he had a favorable outcome with bortezomib.

Outcomes: There are no guidelines for the diagnostic workup or acute management of NS. Even so, if the treatment is delayed, the patient can experience infection, thromboembolism, or acute renal failure. The approach taken here was effective and allowed a rapid NS management (Table 1).

Conclusions: This case is a reminder to include the differential diagnosis of NS in the early evaluation of an adult consulting the ED for peripheral edema.

References:
1. Mahalingasivam V, Booth J, Sheaff M, et al.: Nephrotic syndrome in adults. Acute Medicine. 2018; 17(1): 36–43.
2. Gillmore JD, Wechalekar A, Bird J, et al.: Guidelines on the diagnosis and investigation of AL amyloidosis. Br J Haematol. 2015; 168(2): 207–18.
3. Joshua G, Bijon D: Keeping nephrotic syndrome on the emergency department edema differential: A case report. World J Emerg Med. 2019; 10(2): 116–118.
4. Hull RP, Goldsmith DJ: Nephrotic syndrome in adults. BMJ. 2008; 336(7654): 1185–9.
5. McCloskey O, Maxwell AP: Diagnosis and management of nephrotic syndrome. Practitioner. 2017; 261 (1801): 11–5

Therapeutic effect of adding magnesium sulfate in treatment of organophosphorus poisoning: A meta-analysis

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Background: Organophosphorus (OP) is widely used as an insecticide. It is considerably harmed for suicide or accidentally taken. Atropine with pralidoxime is standard treatment for OP poisoning but reducing mortality is unclear1. Magnesium sulfate is one of optional adding treatments, however, its therapeutic effect needs more evidence2.

Objective: This study aimed to systematically review and meta-analysis therapeutic effects of add-on magnesium sulfate to standard treatment for OP poisoning on mortality and intubation.

Method: We systematically searched clinical studies on PubMed, MEDLINE, Embase and Cochrane Library. Keywords are organophosphate poisoning and magnesium sulfate. We determined publishing of therapeutic effect of magnesium sulfate for OP poisoning on mortality and intubation during 1990 to October 2021. Unpublished studies were obtained using a hand search technique. Meta-analysis of each outcome was performed under a random-effects model. I2 was used to quantify statistical heterogeneity. The risk of bias of each study was assessed using the Risk of Bias tool version 2.0.

Results: Totally, seven randomized controlled trials3,4–9 and one case series10 with 483 patients were included. There are 258 patients receiving magnesium sulfate and 225 control patients. The pooled risk ratio (RR) for mortality was 0.36 (95% confidence interval [CI]; 0.21 to 0.62, I2 = 0%), while the RR for intubation was 0.71 (0.58 to 0.87, I2 = 0%). Six studies were assessed as high risk-of-bias and one study was assessed as low risk-of-bias.

Conclusion: Magnesium sulfate as an add-on treatment to atropine with pralidoxime could significantly reduce mortality and intubation in patients with OP poisoning.

References:
1. Kharel H, Pokhrel N, Ghimire R, Kharel Z. The Efficacy of Pralidoxime in the Treatment of Organophosphate Poisoning in Humans: A Systematic Review and Meta-analysis of Randomized Trials. Cureus. 2020;
2. Brvar M, Chan M, Dawson A, Ribchester R, Eddleston M. Magnesium sulfate and calcium channel blocking drugs as antidotes for acute organophosphorus insecticide poisoning – a systematic review and meta-analysis. Clinical Toxicology. 2018;56(8):725–736.
3. Higgins J, Altman D, Gotzsche P, Juni P, Moher D, Oxman A et al. The Cochrane Collaboration’s tool for assessing risk of bias in randomized trials. BMJ. 2011;343(oct18 2):d5928-d5928.
4. Pajoumand A, Shadnia S, Rezaie A, Abdi M, Abdollahi M. Benefits of magnesium sulfate in the management of acute human poisoning by organophosphorus insecticides. Hum Exp Toxicol. 2004;23(12):565–9.
5. Basher A, Rahman SH, Ghose A, Arif SM, Faiz MA, Dawson AH. Phase II study of magnesium sulfate in acute organophosphate pesticide poisoning. Clin Toxicol (Phila). 2013;51(1):35–40.
6. Jamshidi F, Yazdanbakhsh A, Jamalian M, Khademhosseini P, Ahmadi K, Sistani A, et al. Therapeutic effect of adding magnesium sulfate in treatment of organophosphorus poisoning. Open Access Macedonian Journal of Medical Sciences. 2018;6(11):2051–6.
7. Vijayakumar HN, Kannan S, Tejasvi C, et al. Study of effect of magnesium sulfate in management of acute organophosphorous pesticide poisoning. Anesth Essays Res. 2017; 11:192–196.
Examining the lived experiences of mentees in an Asian postgraduate mentorship program

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Background: Mentoring programs in post-graduate medicine have been implemented across academic systems worldwide.1 Effective mentoring relationships facilitate one's career growth and personal development, and are driven by social, cultural, and environmental contexts.2

Objectives: This qualitative study aims to examine the lived experiences of mentees and identify Asian socio-cultural influence that could be potential contributors and/or barriers to successful mentorship.

Method: Semi-structured, peer-to-peer interviews were conducted within the Singhealth Pediatrics Residency Program. A 15 residents (mentees) were selected via purposive sampling to ensure comprehensiveness. Questioning followed a pre-designed interview guide and was encouraged until data saturation. All interviews were recorded and transcribed verbatim. The transcripts were reviewed and analyzed for common themes that best described the interviewees’ lived experiences.

Results: Three main themes were identified in the interviews. Firstly, the majority had formal and role-modeling relationships with their mentors, which involved administrative work and unidirectional sharing of knowledge. Secondly, there was perceived power differential within the hierarchical system, which led to an obligation to maintain a respectful distance from their superiors. Lastly, fear of judgment and criticism among mentees contributed to significant self-consciousness towards mistakes and failure. These factors promoted professional behavior in their stipulated interactions, but at the same time impeded open communication and positive growth within the mentoring relationship.

Conclusion: This qualitative study highlights the many variables associated with effective mentorship, which are inevitably influenced by Asian socio-cultural concepts of communitarianism and collective identity. There is room for future work in designing a mentoring program that will optimize the mentoring experience and improve career fulfillment.

References:
1. Sambunjak D, Straus SE, Marusić A. Mentoring in academic medicine: a systematic review. JAMA 2006;296(9):1103–15.
2. Ramanan RA, Taylor WC, Davis RB, Phillips RS. Mentoring matters. Mentoring and career preparation in internal medicine residency training. J Gen Intern Med 2006;21(4):340–5.

Improving efficiency of our critical care

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Introduction: Emergency departments (EDs) worldwide provide 24/7 urgent medical care to the community and are involved in the resuscitation of critically unwell patients. The COVID pandemic has added a layer of complexity to provision of this care given its highly transmissible nature so items can no longer be stocked within the resuscitation bays, but has served us a timely reminder to review and improve our current practices. Large number of staff, long working hours, the fast-paced ED environment, and a wide spectrum of ED presentations all contribute to cognitive fatigue which can impair the delivery of patient care. Checklists can provide an alternative to dependence on memory and instinct to ensure safe and consistent practices in an otherwise chaotic environment.

Description: This quality improvement project (QIP) was commenced as part of the structural redevelopment of an ED. It involved the development of a “Procedures” trolley and structural checklists to standardize all 5 resuscitation bays and improve patient care. A collaborative approach was used and members included medical and nursing staff, equipment officer, and administration.

Outcomes: An anonymous digital survey of staff will be organized on the SurveyMonkey platform to assess ease of use, ease of access, user satisfaction, and ways to improve.

Conclusions: Use of checklists have long been ingrained into the practices of critical service providers, including...
the ambulance service, pilots, operators of heavy machinery and more.

This was an opportunity to improve workplace practices with the upcoming ED restructuring, mainly to standardize practices, and reduce variability between clinicians/staff hence reducing the chance of error in an environment of “controlled-chaos”.

It is hoped that this poster could help other centers undergoing restructuring, and also gather feedback from conference delegates on alternative approaches to improve our provision of care.

Toeing the (Mid)line—A quality improvement project on introducing a new procedure to a hospital and ending the era of patient pin-cushions
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Introduction: Emergency departments (EDs) worldwide provide 24/7 urgent medical care to the community and are perhaps considered the main “gatekeepers” to hospital admissions.

The COVID pandemic has added a layer of complexity to provision of inpatient care, but has served a timely reminder for us to revisit the concept of hospital avoidance and community care.

Obesity rates are on the rise and a major indication for admission is administration of drug and fluid therapy via peripheral intravenous cannulas (PIVCs).

The current standard of inserting PIVCs of varying lengths, with or without ultrasound guidance, have resulted in patients requiring multiple attempts throughout their patient journey.

This QIP was developed with a patient-centered approach to difficult IV access.

Description: As Midline Catheters are new to the Northern Adelaide Local Health Network (NALHN), a document had to be written first to provide clinical governance on its use.

Once formalized, training will be provided to staff with a certification of procedural competency at the end.

Midlines will be inserted in ED and patient tracked via a logbook.

Outcomes: An audit of Midlines will be done at end of the first month of implementation.

This will include insertion numbers, indication, success rates, complications, and patient satisfaction.

Ongoing audits and training will be done 6 monthly to refine and maintain the service.

Conclusions: Midlines have been shown to be useful in centers Australia and worldwide.

This is a current project and provision of this service is expected to be ongoing.

This poster is also done with the intention of encouraging fellow trainees to engage in QIPs and provide a brief guide on procedure writing.

Trends in the osteosynthesis of pelvic and acetabular fractures with the Japanese aging society referred to the national database
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Background: As age distributions becomes older, the osteoporotic fracture is the social issue. The osteosynthesis of pelvic and acetabular fracture with percutaneous procedure is also becoming more common for elderly.

Objectives: The purpose of this study was to analyze four-year trends, gender differences, and age distributions from the annual numbers for pelvic and acetabular osteosynthesis based on the Japanese complete study referred to Japanese National Database of Health Insurance Claims and Specific Health Checkups of Japan.

Method: The number of summarized by sex and age group under operation of pelvic (K124–2) and acetabular (K125) referred to Japanese National Database for 2016–20192. We selected the descriptive study, the most common method of this open data referred to the review study3.

Results: The trends of both pelvic and acetabular fracture have two obvious findings in Figure 1.

First, the number of the both osteosynthesis is increasing in 50–74 and over 75-year-old groups in both sexes. Second, the trend of pelvic fracture is V-shape difference; under 20-year-old male group is decreasing by 100, but over 75-year-old female group is increasing as the year goes by.

The menopausal pelvic might easily get injured due to the pelvic ring shape or rapid bone quality change4.5

Conclusion: In Japan, the trend of pelvic and acetabular osteosynthesis is higher and higher for over 50-year-old patients as the society is aging. Especially, over 75-year-old women is the highest risk of fragility fracture of pelvic among the other groups.

References:
1, Rommens PM, Hofmann A, Kraemer S, Kisilak M, Boudissa M, Wagner D: Operative treatment of fragility fractures of the pelvis: a critical analysis of 140 patients. Eur J Trauma Emerg Surg 2021.
2, Ministry of Health, Labor and Welfare. NDB open data Japan. https://www.mhlw.go.jp/stf/seisakunitsuite/bunyuu/0000177221_00010.html
3, Hirose N, Ishimaru M, Morita K, Yasunaga H: A review of studies using the Japanese National Database of Health Insurance Claims and Specific Health Checkups. Annals of Clinical Epidemiology 2020; 2 (1):13–26.
4, Charles A, Mugisha A, Iconaru L, Baleanu F, Benoit F, Surquin M, et al: Impact of non-hipfractures in elderly women: a narrative review. Climacteric. 2021:1–6.
Music for Anxiolysis: A Randomized Controlled Trial on Adult Trauma Patients 19–65 Years of age exposed to music in a tertiary government hospital

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Background: Anxiety is perhaps among the first emotions experienced in emergencies, which may modulate patient experiences. This study aims to address anxiety in the Emergency Department (ED) using music as a therapeutic option, as scarcity of literature exists for common trauma procedures.

Objectives: To determine the difference in 1.anxiety levels using the State-Trait Anxiety Inventory(STAI) and 2.physiologic parameters(heart rate, blood pressure, pain using numeric rating scale) between adult trauma patients 19–65 years old exposed to music, versus patients receiving standard treatment only in the ED.

Method: Participants were randomly assigned to either control or experimental group. Both underwent standard evaluation and treatment. Control group was placed on headset only, while the experimental group was placed on headset playing classical music for the duration of treatment. Physiologic and STAI scores were taken before and after treatment.

Results: Forty-eight patients were included in this trial. Using ANOVA and Fisher’s exact test, all participants had decreases in anxiety scores not reaching statistical significance; blood pressure, expected to have inverse results to pain scores, had no linear relationship to any variable. With Welch 2-sample T-test, pain scores were significantly different pre-and post-intervention in both control and experimental group (p = 2.257e-07,

Figure 1. The trends of the osteosynthesis for pelvic or acetabular fractures by sex and age.
p = 0.0009 respectively), while heart rate alone for the experimental group reached significance (p = 0.007).

**Conclusion:** Key points include the observation that intervention in trauma patients results in naturally decreased anxiety and pain. Pain in this Asian sample are unlikely to be influenced by music, anxiety, and heart rate; further studies are needed to establish linear or nonlinear relationships of pain and blood pressure.

### ‘Consistency in the treatment of patients who misuse opiates in Leeds: A clinical audit-cum-service evaluation’

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**Objective:** Current local and national guidelines on managing opiate withdrawal are vague, with no timeframes or recommended prescription regimes. LTHT (Leeds Teaching Hospitals Trust) recommends using the Clinical Opiate Withdrawal Scale (COWS) when assessing opiate withdrawal. This study aimed to discover how consistently COWS was used and how long patients could expect to wait until they received Opiate Substitution Therapy (OST).

**Methods:** An audit-cum-service evaluation via the retrospective review of patient notes. The study considered all patients admitted to an acute ward via Accident and Emergency (A&E) in LTHT in 2020.

**Results:** On average, patients waited over 14 h for OST prescription, and a further three for administration. Though more than 75% of clinicians in a secondary survey reported using COWS to assess withdrawal at least sometimes, less than 10% of admissions in this study had a recorded COWS score. The increased morbidity and mortality of this patient group was glaringly apparent in this study; the average patient age was 42, more than 10 years younger than the average age of a general admission (53 years), and one of the 36 patients died in the 12-month study period (nearly three times higher than the mortality rate in the general population).

**Conclusions:** COWS is not fit for purpose. It does not support clinicians to make timely decisions about patient management plans and does not support the prescription of OST. The lack of clear national and local guidelines are allowing this patient demographic to receive inequitable care.

**References:**
1. ONS OfNS. Hospital Admitted Patient Care Activity, 2015–16. NHS Digital2016.
2. Trust N. Mortality rates: Nuffield Trust; 2021 [Available from: https://www.nuffieldtrust.org.uk/resource/mortality-rates.

### Spontaneous prevertebral emphysema following weight training in a 21 year old female

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1,2

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**Introduction:** Subcutaneous emphysema (SCE) of the head, neck, and mediastinum most commonly arises due to penetrating trauma and iatrogenic events facilitating air entry into these spaces. Spontaneous SCE can emerge due to a pressure gradient between the intra-alveolar air and surrounding structures, causing alveolar rupture and dissection of the peri-bronchovascular sheath. This is known as the Macklin effect. Potential consequences include pneumomediastinum, pneumothorax, facial emphysema, and pneumoracchis.

**Objectives:** We aim to describe a case of SCE in a 21 year old female presenting to the emergency department (ED) after weight training.

**Description:** A 21 year old female presented to the ED with a sore throat and dysphagia after weight lifting in the gym six hours earlier. Training involved repeat valsalva manoeuvres. She experienced sharp pain with onset over an hour, worse with swallowing. She had a history of gastroesophageal reflux disease. Vital signs, local examination, and systemic examination were unremarkable. The diagnosis was made with soft tissue neck x-ray, demonstrating emphysema within the prevertebral space extending from the skull base to first thoracic vertebra (Fig. 1). Her chest x-ray showed no pneumothorax or pneumomediastinum.

**Outcomes:** No intervention was required beyond analgesia and she was discharged from the ED. She was advised to avoid heavy lifting and diving. A follow up radiograph showed resolution of the SCE.

**Conclusion:** This case is an important rare entity and highlights for clinicians that pain after physical exercise...
may involve injuries extending beyond the area directly trained.

Reference:
1. Maunnder RJ, Pierson DJ, Hudson LD. Subcutaneous and Mediastinal Emphysema: Pathophysiology, Diagnosis, and Management. Archives of Internal Medicine. 1984;144(7):1447–53.

Efficacy of online-behavioral therapies in easing the mental-health burden of the COVID-19 pandemic
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Background: Mental health disorders are now considered the leading cause of disability globally. Despite this, 70% of individuals needing care worldwide lack access to sufficient services. Unfortunately the COVID-19 pandemic has only exacerbated this mental-health pandemic, and put further pressure onto emergency medicine health service delivery. It is imperative that through the adversity of the pandemic we find innovative solutions to help ease the burden on patients and health systems. Online-behavioral therapies have the potential to help solve this crisis.

Objective: This study seeks to establish the efficacy of online-behavioral therapies used during the COVID-19 pandemic period in the treatment and prevention of mental-health disorders.

Methods: This research has been conducted as a qualitative literature review. Search strategies were employed on a number of electronic databases to identify randomized-controlled trials that were completed during the COVID-19 pandemic period.

Results: Online-behavioral therapies can be broadly divided into self-guided therapy and therapist-guided therapy. Both modalities show efficacy in reducing stress, anxiety, and depression related to the COVID-19 pandemic. They are also safe, cost-effective, easily-scalable and report high levels of usability, acceptability and satisfaction.

Conclusion: The COVID-19 pandemic has intensified the global mental-health pandemic. However, it has also provided the opportunity to reassess and redevelop the way we deliver mental-health services. Online-behavioral therapies have the potential to be offered as a complementary and alternate treatment modality to existing mental-health services. This new hybrid mental-health system could significantly increase service capacity and ease emergency department overcrowding.

The Role of the Emergency Department in Implementing an ECMO Cardiopulmonary Resuscitation (E-CPR)
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Introduction: The Royal Brisbane and Women’s Hospital has introduced an ECMO cardiopulmonary resuscitation (E-CPR) service with collaboration between emergency department (ED) and intensive care unit (ICU) teams for refractory cardiac arrest patients.

Description: We discuss our rationale to use the ED and the emergency physician (EP) role in leading the multidisciplinary team, with ICU leading the cannulation team. E-CPR benefits patients who do not gain return of spontaneous circulation after conventional ACLS (advanced cardiac life support) treatments, provided specific demographic and biochemical inclusion criteria are met.

Outcomes: The ED is easily accessible to prehospital staff to continue resuscitation by a skilled team whilst cannulation occurs. A joint ICU and ED decision is reached to commence ECMO fluid. ED staff often work with undifferentiated presentations with little notice and preparation time. The ED is the first destination for the ambulance service and there is well-rehearsed handover and reception for unstable patients. The EP is skilled in leading complex multidisciplinary resuscitations and well suited to managing the resuscitation, the cause of which may be initially undifferentiated. EPs and other ED staff are experienced with managing cases of E-CPR ineligibility, where resuscitation efforts may be unsuccessful and breaking bad news to families.

Conclusions: Development of ED processes increased availability of this intervention which can significantly impact survivability of refractory cardiac arrest.

Reference:
1. Dennis M, et al. Prospective observational study of mechanical cardiopulmonary resuscitation, extracorporeal membrane oxygenation and early reperfusion for refractory cardiac arrest in Sydney: the 2CHEER study. Crit. Care Resusc. 2020; 22: 26–34.

Sticking out like a sore thumb: Infectious tenosynovitis
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Introduction: Infectious Tenosynovitis is an Orthopedic emergency if goes unrecognized can cause long-term disability with tendon necrosis and permanent contracture.[1]

Description: A patient with underlying SLE presented to emergency department (ED) with severe pain and swelling on her left thumb resulting from a needle prick during sewing. On examination, the left thumb was warm, erythematous, tender, and swollen with a small punctum. She was unable to extend the metacarpophalangeal joint of thumb and positive Finkelstein test. She was treated for left thumb tenosynovitis. Orthopedic team did flexor tendon washout. Intraoperatively noted thickened tendon sheath and slough up to distal forearm with negative cultures. Patient was discharged well after completing antibiotics.

Outcomes: Tenosynovitis can be due to infective or non-infective causes which involves overusage of affected tendons in the hand.
tendon and inflammatory conditions such as rheumatoid and SLE.[3,5] In this patient who has underlying SLE and history of penetrating injury presenting with some features of the Kanavel sign led to a diagnosis of infectious flexor tenosynovitis. Prompt management for infective tenosynovitis are adequate analgesia, broad-spectrum antibiotics and urgent surgical incision, irrigation and debridement which was effective. [5,6] In non-infective causes, differentials should include de quervain’s tenosynovitis, trigger finger or just flare symptom of SLE.

Conclusions: We would like to highlight the importance of recognizing signs of infectious tenosynovitis as an Orthopedic emergency in ED setting and prompt management such as pain control and antibiotics. Infectious and non-infectious tenosynovitis can be a challenge especially in patients with underlying inflammatory conditions e.g., Rheumatoid and SLE.

References:
1. StuWilli. Infectious versus Inflammatory Flexor Tenosynovitis: A Little, Big Problem. https://www.jucm.com/infectious-versus-inflammatory-flexor-tenosynovitis-little-big-problem/. Published September 4, 2018.
2. Siconolli D, Espinosa J, Lucerna A, Mordecai R. Flexor Tenosynovitis After Bite by Sugar Glider. Tenosynovitis: 5-Minute Emergency Consult. Teno-synovitis | 5-Minute Emergency Consult. https://emergency.unboundmedicine.com/emergency/view/5-Minute_Emergency_Consult/307108/all/Tenosynovitis. Accessed August 22, 2021
3. Tenosynovitis: 5-Minute Emergency Consult. Tenosynovitis | 5-Minute Emergency Consult. https://emergency.unboundmedicine.com/emergency/view/5-Minute_Emergency_Consult/307108/all/Tenosynovitis. Accessed August 22, 2021
4. Sexton DJ, Leversedge FJ. Infectious tenosynovitis. UpToDate. https://www.uptodate.com/contents/infectious-tenosynovitis. Accessed August 22, 2021
5. Infectious Flexor Tenosynovitis by David R. Steinberg, By, Steinberg DR, Last full review/revision May 2020! Content last modified May 2020. Infectious Flexor Tenosynovitis - Musculoskeletal and Connective Tissue Disorders. MSD Manual Professional Edition. https://www.msdmanuals.com/professional/musculoskeletal-and-connective-tissue-disorders/hand-disorders/infectious-flexor-tenosynovitis. Accessed August 22, 2021.
6. Tenosynovitis - Knowledge @ AMBOSS. https://www.amboss.com/us/knowledge/Tenosynovitis/.

The Pediatric anesthetic emergency drug solution (PAEDS)—A novel cognitive offload tool during Pediatric rapid sequence induction in the emergency department? A mixed methods pilot study exploring its influence on clinician cognitive load

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Background: Rapid sequence induction (RSI) in children is a low incidence, high risk event with cognitive overload and errors producing unfavorable outcomes. The PAEDS approach, a volume-based medication system, aims to reduce error by simplifying dose calculations. Mathematical cognitive aids reduce error, however, the effect on cognitive load has not been described.

Objectives: To determine if the PAEDS approach improves clinician cognitive load and reduces error and time to medication administration during simulated Pediatric RSI.

Method: A randomized, cross-over trial was conducted with 26 multi-disciplinary participants allocated to four groups performing four high-fidelity RSI simulations, two using the PAEDS approach. It is a mixed methods study following the pragmatism ontology using grounded theory methodology. Cognitive load was assessed and statistically analyzed using the raw NASA-Task Load Index questionnaire and individual interviews. Safety was assessed by measuring time to medication delivery and errors in drug dose administration.

Results: Qualitative results showed that the PAEDS approach subjectively reduced cognitive loading through both the labeled medication box and color-coded medication charts. The PAEDS approach also showed improved perceived time pressure without feeling rushed with no recorded drug errors. The quantitative data for total cognitive load, error, and time was not statistically significant due to sample size.

Conclusion: The PAEDS approach is a multifaceted system which, when compared to current practice, was not inferior with some tools described as an improvement. Further research on a larger sample size needs to be
conducted to assess the aspects of the PAEDS approach both collectively and independently.

References:
1. Ghedina N, Alkhouri H, Badge H, Fogg T, McCarthy S. Pediatric intubation in Australasian emergency departments: A report from the ANZEDAR. Emergency Medicine Australasia [Internet]. 2020 Jun 3 [cited 2021 Apr 26];32(3):401–8. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/1742-6723.13416
2. Groombridge CJ, Kim Y, Maini A, Smit DV, Fitzgerald MC. Stress and decision-making in resuscitation: A systematic review [Internet]. Vol. 144, Resuscitation. Elsevier Ireland Ltd; 2019 [cited 2021 Apr 26]. p. 115–22. Available from: https://pubmed.ncbi.nlm.nih.gov/31562904/
3. Dwyer D. Pediatric Anesthetic Pediatric Anesthetic Emergency Drug Solution “PAEDS.” 2012. ECI Emergency Care Symposium, New South Wales.
4. Moreira ME, Hernandez C, Stevens AD, Jones S, Sande M, Blumen JR, et al. Color-coded prefilled medication syringes decrease time to delivery and dosing error in simulated emergency department pediatric resuscitations. In: Annals of Emergency Medicine [Internet]. Mosby Inc.; 2015 [cited 2021 Apr 26]. p. 97–106.e3. Available from: https://pubmed.ncbi.nlm.nih.gov/25701295/
5. Hart SG. Nasa-Task Load Index (NASA-TLX); 20 Years Later. Proceedings of the Human Factors and Ergonomics Society Annual Meeting [Internet]. 2006 Oct 5 [cited 2021 Apr 26];50(9):904–8. Available from: http://journals.sagepub.com/doi/10.1177/154193120605000909

The sinister double block
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Introduction: Criteria for acute myocardial infarction (AMI) with left bundle branch block (LBBB) has been well established whereas little can be said for infarct-related electrocardiogram (ECG) changes in right bundle branch block (RBBB).

Description: A 34 year-old active smoker gentleman with no known medical illness, presented with sudden onset of persistent central burning chest pain, radiating from epigastrium for 2 h. He denied other symptoms and clinically, he had stable vitals with normal physical examination. Serial ECG showed RBBB with no evolving changes. His blood parameters were normal. He was managed as acute dyspepsia and discharged. He had out-of-hospital cardiac arrest 12 h later and did not survive.

Discussions: Universally, ECG criteria for AMI has been well described mainly as ST-elevation and presumed new LBBB. RBBB was previously not important in the diagnosis of AMI. However, Widimsky et al. suggested that subtle ST-elevation might be concealed when there is “pseudonormalization” of T-waves in the right precordial leads. Meyer published in 1949 suggesting that T-inversions in limb leads probably indicate infarctions in the presence of RBBB. Dressler et al. has described the common ECG features in different AMI with RBBB. The European Society of Cardiology guideline now recommends primary percutaneous coronary intervention for patients with persistent ischemic symptoms and RBBB.

Conclusions: AMI in the presence of RBBB is not well recognized or described in literatures. Upright T-waves in right precordial leads should be considered red flags and prompt physicians to activate the cath lab.

A case of anti-phospholipid syndrome presented with fever: Unclassical story
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Introduction: Anti-Phospholipid Syndrome (APS) is characterized by the presence of antiphospholipid antibodies with characteristic clinical manifestations, including thrombosis and recurrent fetal loss (1). However, several clinical manifestations are not included in the classical revised criteria of APS, such as neurologic disturbances, leg ulcers, and amaurosis fugax (2). In addition, fever can be present in antiphospholipid syndrome, and cases of APS presenting as fever of unknown origin have been described (4,5).

Description: A 24-year-old male patient presented to the emergency department with a history of collapse, Glasgow Coma Scale (GCS) 9/15, fever 38.8, rash, and tachycardia. Collateral history was only significant for flu-like symptoms. Initial differential diagnosis included: suspected head injury, COVID-19 related stroke, drug overdose, or sepsis (CNS infection). CT and CTA scans (Figure 1) confirmed a left middle cerebral artery (MCA)
thrombus with features of a large acute infarction. COVID-19 PCR test was negative, and the lupus antibody test was positive. Hence, he was finally diagnosed with APS.

Outcomes: A successful embolectomy and Hemi-craniectomy were done, which markedly improved his symptoms and GCS. The patient was discharged with normal vital signs, GCS, and blood tests.

Conclusions: Though APS is one of the most common thrombocytopenias, unfortunately, it is not recognized often enough. The lack of understanding may cause severe complications such as cerebral stroke, which can, in turn, result in death. Fever (and other unclassical features) rarely accompany APS, so awareness of this uncommon medical condition is vital for prompt diagnosis and early intervention to improve patients’ outcomes.

References:
1. Cecchi I, Radin M, Rubini E, Foddai SG, Barinotti A, Roccatello D, et al. Clinical manifestations in patients with antiphospholipid antibodies: Beyond thrombosis and pregnancy loss. Lupus. 2021;30(6):884–92.
2. Garcia D and Erkan D. Diagnosis and management of the antiphospholipid syndrome. New England Journal of Medicine. 2018;378(21):2010–21.
3. Mazzoccoli C, Comitangelo D, D’Introno A, Mastropierro V, Sabbà C and Perrone A. Antiphospholipid syndrome: a case report with an unusual wide spectrum of clinical manifestations. Autoimmunity Highlights. 2019;10(1):9.
4. Ozaras R, Mete B, Hakko E, Mert A, Tabak F, Bilir M, et al. Primary antiphospholipid syndrome: a cause of fever of unknown origin. Intern Med. 2003;42(4):358–61.
5. Al-Beladi FI. Catastrophic antiphospholipid syndrome presenting as fever of unknown origin. Saudi J Kidney Dis Transpl. 2012;23(1):110–3.

Flesh eaters–A 63 year old female necrotizing fasciitis secondary to non healing diabetic foot: A case report

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Introduction: Necrotizing Fasciitis is a rare rapidly progressing infection that occurs 0.13 to 15 per 100,000 people³⁴⁵ and diabetes as the strongest risk factor³⁴⁸, mortality is as high as 25% to 35%³³⁴⁴⁵. This condition is accompanied by sepsis, multiple organ failure, and sometimes even death. Early in the course of the infection, patients would usually seem benign with signs and symptoms so subtle and non specific³ that physicians would easily miss the diagnosis

Description: a 63 year old female came in due to decrease in sensorium with a Glasgow coma scale of 13 (E4V4M5) and a capillary blood glucose of 562 mg/dl. The patient was a known diabetic and was non compliant to medications. Upon physical examination, there was bullae formation and necrosis observed from the left toe up to 3 cm below the knee. The necrotic tissue had developed over the span of 1 week with associated generalized pain, skin discoloration, bullae formation, and ecchymoses

Outcomes: The patient was referred to Surgery and was directed to the operating room for stat above the knee amputation with vacuum assisted closure. On post op day 5, patient had regained full sensorium but still had subsequent debridement. Patient was also subjected to Hyperbaric oxygen therapy to facilitate healing of the surgical site.

Conclusions: In the picture of Necrotizing fasciitis, a rapidly progressing infection, time is of the essence. Every delay skyrockets the patient’s risk for morbidity and mortality. Physicians must be well equipped to identify this condition at the earliest possible time.

References:
1. Stevens, Dennis; Baddour, Larry (2021), Necrotizing Soft Tissue Infections, UpToDate. Retrieved October 30,2021, from https://www.uptodate.com/contents/necrotizing-soft-tissue-infections?
2. Cheon, L., Fasolca, B., et.al (2020) Necrotizing Fasciitis, A comprehensive review, Retrieved October 30,2021 from https://journals.lww.com/nursing/Fulltext/2020/09000/Necrotizing_fasciitis__A_comprehensive_review.11.aspx
3. Wang, J., Lim H. (2013) Necrotizing fasciitis: eight year experience and literature review, The Brazilian Journal of Infectious Diseases
4. Bonne, S.; Kadri, S. (2017); Evaluation and Management of Necrotizing Soft Tissue Infections, Elsevier Inc.
5. Tintinalli, J. et.al (2020); Tintinalli’s Emergency Medicine a Comprehensive Study Guide 9th edition: Chapter 152: Soft Tissue Infections, McGraw- Hill Education
6. Rogers, Alan; Shahrokhi, Shahriar (2021); Surgical Management of Necrotizing Soft Tissue Infections, UpToDate, Retrieved October 30, 2021 from https://www.uptodate.com/contents/surgical-management-of-necrotizing-soft-tissue-infections?
7. Weaver, L. (2014) Undersea and Hyperbaric Medicine Hyperbaric Oxygen Therapy Indications 13th Edition: Chapter 11: Necrotizing Soft Tissue Infections, Best Publishing Company
8. Jameson, J.L, Kasper, D.L., et.al (2018), Harrison’s Principles of Internal Medicine 20th Edition Chapter 143, Mcgraw-Hill Education
9. Huang KF, Hung MH, Lin YS, et al. independent predictors of mortality for necrotizing fasciitis: a retrospective analysis in a single institution. J Trauma 2011; 71:467.
10. Iacopi, E., Copelli, A. (2015). Necrotizing Fasciitis and The Diabetic Foot. International Journal of Lower Extremity Wounds.

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Pacific emergency care–What is the burden of disease?
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Background: Strengthening emergency care is essential to achieve universal health coverage across Pacific Island Countries and Territories. It has been estimated that emergency medical conditions comprise half of the total burden of disease in low- and middle-income countries (LMICs), but there is no published evidence from the Pacific region. This study sought to determine the burden of emergency medical diseases (EMDs) in the Melanesian countries of Fiji, Papua New Guinea, Solomon Islands, and Vanuatu.

Objectives: The aim of this study was to define and describe the burden of emergency disease in the Melanesian countries of Fiji, Papua New Guinea, Solomon Islands, and Vanuatu.

Method: Morbidity and mortality data for Fiji, Solomon Islands, Papua New Guinea, and Vanuatu were sourced from the Institute for Health Metrics and Evaluation’s Global Burden of Disease Project database. Data were categorized into EMD and non-EMDs based on previously published definitions. Descriptive statistics and graphical representation were used to calculate and describe the burden of EMD.

Results: EMDs account for 43%–61% of all mortality and morbidity in Fiji, Papua New Guinea, Solomon Islands, and Vanuatu. The top five EMDs make up 37%–60% of all mortality and morbidity in these countries.

Conclusion: Approximately half of all morbidity and mortality in Melanesia is attributable to EMDs. This is consistent with previously reported literature for LMICs and contributes to the evidence base for increased attention and improvement of emergency care systems in the Pacific.

Cypermethrin poisoning: Organophosphate mimic poisoning
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Abstract
Cypermethrin is a class II pyrethroid which is widely used to eradicate insects in agriculture sector and households. The toxic oral dose is more than 100 to 1000 mg/kg body weight and lethal dose is 1 to 10 g. As it commonly found and easily obtained in stores, some people make it as a substance to harm themselves.

A 31-year-old man had intentionally ingested 80 ml of cypermethrin. On the initial hours he had experienced stomach upsets and bouts of vomiting. His neurological functions and cardiovascular was normal. However, at 14 h post-ingestion he was breathlessness and there were signs of pulmonary congestion. Crackles was heard over bilateral lung fields and bedside scan revealed ‘B’ lines on all zones. Intravenous (IV) atropine 1 mg slow bolus given and subsequently patient’s condition progressively improved. His oxygenation had picked up and he was much more comfortable since then.

According to Malaysia National Poison Center, Cypermethrin poisoning mimics organophosphate sign and symptoms but it is purely not an organophosphate (3). There was a proposed criterion published decades ago for occupational acute pyrethroid poisoning mostly inhalational. The symptoms may vary from organophosphate but might be mistaken as the hypersalivation, vomiting and pulmonary edema are prominent in patient with acute poisoning. Therefore, for the provider with first encounter of intentional ingestion will have uncertainties in the management. There is no antidote for pyrethroid poisoning. However, anticholinergic drug to be use in Cypermethrin poisoning is still need to be explored.

References:
1. Dr R N Das, Dr Sudip Parajuli, Cypermethrin Poisoning and Anti-cholinergic Medication. Internet Journal of Medical Update, Vol. 1, No 2, Jul-Dec 2006
2. Hasibur Rehman, Al Thbiani Aziz, Shalini Saggu, Zahid Khorsheid Abbas, Anand Mohan, Abid A. Ansari, Systematic review on Pyrethroid Toxicity with Special Reference to Deltamethrin. Journal of Entomology and Zoology Studies 2014
3. National Poison Center USM (04–6570099)

Comparing RIPASA and Alvarado scores for the diagnosis of acute appendicitis
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Introduction: Alvarado score is the most well-known appendicitis clinical diagnostic tool and has been in use since 1986. The RIPASA score was formed in 2010 and was thought to have better diagnostic performance in the Asian population. We reviewed the prospective studies that compared the diagnostic performance of the RIPASA and Alvarado scores.

Description: An electronic search was conducted by accessing PubMed, Ovid® SP, Cochrane Central Register of Controlled Trials, Google Scholar, and BestBETs from 1946 to the 1 June 2020. QUADAS-2 tool (Table 2) was used for cohort studies appraisal and AMSTAR-2 tool for the systematic review.

Outcomes: From 25 potentially relevant studies, seven cohort studies and one meta-analysis were published between 2017 and 2020 and included in this review (table 1). A total of 3009 patients were enrolled, and
| Study                      | Design                                      | Population                                                                 | Intervention & Outcome                                                                 | Key results                                                                 | Comments                                                                 |
|---------------------------|---------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Frountzas 2018            | A meta-analysis of 12 observational cohort   | 2161 patients                                                              | Outcomes: Diagnostic accuracy of RIPASA (score > 7.5) versus Alvarado (score > 7):     | RIPASA is more sensitive                                                   | Included studies of moderate quality:                                    |
| [Frountzas M, Stergios K, | studies                                      | Patients with a clinical diagnosis of acute appendicitis                    | 1. Sn • Sp  • ROC AUC • Odds ratio                                                    | Alvarado is more specific                                                  | • Low risk of bias: patient selection 25%, index test 50%, reference standard 15%, timing and flow 45% |
| Kopsini D, Schizas D,     |                                             |                                                                             | 2. AUC and Odds ratio are higher for RIPASA                                             | Alvarado: Sn: 94% vs 69%  Sp: 55% vs 77%  AUC: 0.943 vs 0.794 Odds Ratio: 24.6 vs 7.9 | • Low applicability concern: patient selection 75%, index test 80%, reference standard 25% |
| Kontzoglou K, Toutouzas K,|                                             |                                                                             | 3. RIPASA vs Alvarado: 7.75 for RIPASA vs 6 for Alvarado                               |                                                                              |                                                                          |
| Alvarado or RIPASA score  |                                             |                                                                             | 4. Optimal cut off: 7.75 for RIPASA for Alvarado                                      |                                                                              |                                                                          |
| for diagnosis of acute    |                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| appendicitis? A           |                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| meta-analysis of          |                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| randomized trials. Int J  |                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| Surg [Internet]. 2018;56  |                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| (March):307–14. Available |                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| from: https://doi.org/10. |                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| 10.1016/j.ijsu.2018.07.003]|                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| Dezfuli 2020              | Prospective cohort study                    | 212 patients                                                                | Outcomes: Diagnostic accuracy of RIPASA versus Alvarado:                              | RIPASA had better sensitivity, NPV, and AUC                                 | From 212 patients, only the 133 who went to surgery were included in the analysis |
| [Ashkan Tabibzadeh Dezfuli | Setting: A&E Department in a university     | Inclusion: Patients with RIF pain • Hospitalized in the emergency room • Age | Alvarado had better specificity • PPV is similar • RIPASA vs Alvarado:                | Alvarado had better specificity • PPV is similar                            | To many exclusion criteria including nail polish and fever                 |
| S, Yazdani R, Khorasani M,| hospital                                     | > 15 • Skin pigmentation, nail polish, venous pulse, severe anemia (Hb < 5), | Sn: 93.4% vs 53.9%  Sp: 45.6% vs 70.2%  PPV: 69.6% vs 70.7%  NPV: 83.9% vs 53.3%  AUC: 0.739 vs 0.662 | Alvarado: Sn: 93.4% vs 53.9%  Sp: 45.6% vs 70.2%  PPV: 69.6% vs 70.7%  NPV: 83.9% vs 53.3%  AUC: 0.739 vs 0.662 | High negative appendectomy rate (42.8%)                                  |
| Alireza Hosseinikhhah S.  |                                                                             | vascular dislocation, low blood pressure, and fever                         | Optimal cut off 7.75 for RIPASA for Alvarado                                          | Optimal cut off 7.75 for RIPASA for Alvarado                                 | Imprecise results: CI overlaps for specificity, PPV, and NPV              |
| Comparison between the    |                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| specificity and sensitivity|                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| of the RIPASA and Alvarado|                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| Scoring systems in the    |                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| diagnosis of acute        |                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| appendicitis among        |                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| patients with complaints  |                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| of right iliac fossa. AIMS|                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| Public Heal. 2019;7(1):1–9|                                                                             |                                                                             |                                                                                       |                                                                              |                                                                          |
| Rodríguez 2018            | Prospective cohort study                    | 137 patients                                                                | Outcomes: Diagnostic accuracy of RIPASA versus Alvarado:                              | RIPASA and Alvarado performance was identical                               | From 212 patients, only the 133 who went to surgery were included in the analysis |
| [Bolívar-Rodríguez MA,    | Setting: Department of General Surgery     | Inclusion: Abdominal pain suggestive of AA • 15–70 years old                | Alvarado (score > 7);                                                                  | Alvarado:                                                                     | To many exclusion criteria including nail polish and fever                 |
| Osuna-Wong BA, Calde   |                                             |                                                                             |                                                                                       |                                                                              | High negative appendectomy rate (42.8%)                                     |
| rón-Alvarado AB           |                                             |                                                                             |                                                                                       |                                                                              | Imprecise results: CI overlaps for specificity, PPV, and NPV                |
| Study | Design | Population | Intervention & Outcome | Key results | Comments |
|-------|--------|------------|------------------------|-------------|----------|
| Matus-Rojas J, Dehesa-López E, Peraza-Garay F, de J. | in a university hospital | Exclusion: Known cause of pain | Sn | Sn: 97.2 |
| | | Pain after admission | Sp | Sp: 27.6 |
| | | Reference: histopathology | PPV | PPV: 83.3 |
| | | | NPP | NPP: 72.7 |
| | | | FPR | FPR: 72.4 |
| | | | FNR | FNR: 2.8 |
| | | | Accuracy | Accuracy: 82.5 |
| Khan 2020 | Prospective cohort study | From 01 Feb to 26 April 2018 | Sn | RIPASA outperformed Alvarado in all parameters |
| | | Setting: The 3 surgical units of Ayub Teaching Hospital | Sp | Alvarado had low sensitivity |
| | | Reference: histopathology | PPV | RIPASA vs Alvarado: Sn: 94% vs 62% |
| | | | NPP | Sp: 87% vs 83% |
| | | | FPR | PPV: 97% vs 94% |
| | | | FNR | NPV: 77% vs 33% |
| | | | Accuracy | Accuracy: 92% vs 65% |
| | | | ROC AUC | AUC: 0.783 vs 0.782 |
| Khan S, Usama M, Basir Y, Muhammad S, Jawad M, Khan T, et al. | Prospective cohort study | From Nov 2014 to Nov 2015 | Sn | RIPASA had better sensitivity, NRL, and NPV |
| | | Setting: Nemazee hospital | Sp | Alvarado had 100% specificity and PPV |
| | | Reference: histopathology | PPV | RIPASA vs Alvarado: Sn: 93.2% vs 78.4% |
| | | | NPP | Sp: 91.7% vs 100% |
| | | | FPR | PPV: 98.8% vs 100% |
| | | | FNR | NPV: 64.7% vs 38.7% |
| | | | Accuracy | PLR: 11.2 vs -- |
| | | | | NLR: 0.074 vs 0.220 |
| | | | | ROC AUC: 0.981 vs 0.906 |

(Continues)
| Study          | Design                      | Population | Intervention & Outcome | Key results                                                                 | Comments                                      |
|---------------|-----------------------------|------------|------------------------|-----------------------------------------------------------------------------|-----------------------------------------------|
| Rangel 2018   | Prospective cohort study    | 100 patients | Diagnosis of Acute Appendicitis in Relation to the Alvarado Score. | RIPASA outperformed Alvarado in all parameters                            | Included 100 out of 218 patients treated in the recruitment period |
|               | From 01 June to 31 Dec 2016 |            |                        | Sn: 98.8% vs 90.7%  Sp: 71.4% vs 63.4%  PPV: 95.5% vs 94.1%  NPV: 90.9% vs 60.0%  PLR: 3.5 vs 2.5 | AUC: 0.88 vs 0.80 |
|               | Setting: ED of High Specialty Hospital of Veracruz | |                        | Reference: histopathology | | |
|               | Reference: histopathology | |                        | Outcomes: Diagnostic accuracy of RIPASA (cutoff 7.5) versus modified Alvarado (cutoff 7): | | |
| Damburaci 2019 | Prospective cohort study    | 100 patients | Diagnosis of Acute Appendicitis in Relation to the Alvarado Score. | RIPASA outperformed Alvarado in all parameters                            | Modified Alvarado score |
|               | From Nov 2017 to Oct 2018   |            |                        | Sn: 94.0% vs 88.1%  Sp: 87.5% vs 68.7%  PPV: 97.5% vs 93.6%  NPV: 12.5% vs 31.2%  Accuracy: 85.2% vs 73.4%  AUC: 0.910 vs 0.812 | According to the ROC curve, the optimal cutoff was 8.75 for RIPASA and 5.5 for Alvarado |
|               | Setting: Department of General Surgery, Usak University Hospital | |                        | Reference: histopathology | | |
|               | Reference: histopathology | |                        | Outcomes: Diagnostic accuracy of RIPASA (cutoff 8) versus Alvarado (cutoff 7): | | |
| Korkut 2020   | Prospective cohort study    | 74 patients | Diagnosis of Acute Appendicitis; a | RIPASA outperformed Alvarado in all parameters                            | 65 out of the 74 patients had histopathology |
|               | From 02 May 2019 to 01 Dec 2019 | |                        | Sn: 75.0% vs 60.9%  Sp: 65.7% vs 50.0%  PPV: 84.6% vs 71.4%  NPV: 28.9% vs 31.2%  Accuracy: 77.3% vs 69.7%  AUC: 0.790 vs 0.702 | 95% CI overlaps for all parameters |
|               | Setting: ED of a tertiary hospital | |                        | Reference: histopathology | | |
|               | Reference: histopathology | |                        | Outcomes: Diagnostic accuracy of RIPASA (cutoff ≥12) versus Alvarado (cutoff ≥8): | | |
|               | Abdominal pain suspected AA | |                        | RIPASA had better sensitivity, specificity, and NPV                         | | |
|               | Exclusion: Age < 18 years | |                        | Alvarado had better NLR and AUC                                           | | |
|               | Elective appendectomy | |                        | Similar PPV and PLR                                                          | | |
|               | Incarcerated or inguinal hernia | |                        | RIPASA vs Alvarado:                                                         | | |
|               | Sn: 75.0% vs 60.9%  Sp: 65.7% vs 50.0%  PPV: 84.6% vs 71.4%  NPV: 28.9% vs 31.2%  Accuracy: 77.3% vs 69.7%  AUC: 0.790 vs 0.702 | | | | |
### Table 1 (Continued)

| Study | Design | Population | Intervention & Outcome | Key results | Comments |
|-------|--------|------------|-------------------------|-------------|----------|
| Cross-sectional Study. Arch Acad Emerg Med [Internet]. 2020;8(1):e20. Available from: http://www.ncbi.nlm.nih.gov/pubmed/32259117 | • Non-operable patients | • ROC AUC | Sp: 99.7% vs 89.9% | PPV: 98.0% vs 97.6% |
| | • Not accepting hospitalization | | NPV: 34.8% vs 24.2% | PLR: 6.9 vs 5.5 |
| | • Incomplete data | | NLR: 0.26 vs 0.43 | AUC: 0.89 vs 0.93 |

Sn: sensitivity; Sp: Specificity; ROC: receiver operating characteristics curve; AUC: area under the curve; PPV: positive predictive value; NPV: negative predictive value; FPR: false positive rate; FNR: false negative rate; PLR: positive likelihood ratio; NRL: negative likelihood ration; CI: confidence interval.

### Table 2. Summary results of the QUADAS-2 assessment of the cohort studies

| Study | Risk of bias | Applicability concerns |
|-------|--------------|------------------------|
| | Patient selection | Index test | Reference standard | Flow and timing | Patient selection | Index test | Reference standard |
| Dezfuli | High | Unclear | Low | Unclear | Unclear | Low | Low |
| Rodriguez | High | High | Low | Low | Unclear | Low | Low |
| Khan | Unclear | High | Low | Low | Unclear | Low | Low |
| Rangel | High | Low | Low | Low | Unclear | Low | Low |
| Damburaci | High | High | Low | Low | Unclear | Low | Low |
| Karami | Low | Unclear | Low | Low | Unclear | Low | Low |
| Korkut | Low | Unclear | Low | Low | Unclear | Low | Low |
histopathology was the reference standard. In Rodriguez, the performance of RIPASA and Alvarado was identical. RIPASA had higher sensitivity than Alvarado in the other six studies. The specificity of RIPASA was higher in four studies and lower in two. ROC AUC was higher for RIPASA in five studies and higher for Alvarado in a single study. Test accuracy was calculated in two studies, Khan showed higher accuracy for RIPASA, and Rodriguez reported equal accuracy.

Conclusions: This review suggests that RIPASA is more sensitive and would be better than Alvarado in ruling out acute appendicitis. However, the quality of the included studies is low and is not enough to change the current guidelines recommendations that endorse the use of Alvarado score.

Silent chest in illicit drugs user
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Introduction: According to statistic from Malaysia Ministry of Home Affairs, 23 267 number of cases reported as drug dependants and only 7% of them at age of over 50 years old in 2018.

Case Report: A 53 years old Chinese gentleman was brought in by an ambulance from community health center with a complaint of severe breathlessness. Patient was initially brought in by his friend at the center but being abandoned without any reliable information. Having severe breathlessness condition, he was unable to give any relevant history to assist the diagnosis. Patient was treated as severe asthma and given intravenous hydrocortisone with continuously nebulizing while being transferred to the nearest tertiary central hospital. Upon his arrival at the emergency department, patient showed symptoms and signs of life-threatening breathlessness with silent lungs and poor oxygen saturation. Physical examination showed severe bronchospasms with normal cardiac and other systems. Chest x – ray showed hyperinflated lungs and urine for drugs was positive for amphetamines, methamphetamines, and morphine. Thus, patient was intubated for airways protection and admitted to ICU for a few days. Subsequently, patient was able to be extubated and discharged well. Later, it was revealed that the patient developed sudden onset of breathlessness after taking illicit pill.

Discussion: Morphine is a favorite choice of opiate substance among them and bronchospasm is well known complication associated with histamine release.

Conclusion: Without relevant history, it is difficult to diagnose severe bronchospasm caused by multidrug reaction. It is always misdiagnosed as COPD or Broncho asthma.

Lung ultrasound (LUS) is helpful for the evaluation of patients with dyspnea in the emergency department (ED)
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Background: Lung ultrasound (LUS) is helpful for the evaluation of patients with dyspnea in the emergency department (ED).

Objectives: This study aimed to evaluate if junior emergency doctors can learn and retain sonographic skills during a 3-h elective.

Method: This prospective study was performed at Tanta university Hospital, evaluating the proficiency of physicians novice to lung ultrasound. After three hours of didactics and hands-on training, physicians independently performed and interpreted ultrasounds on patients presenting to the emergency department with dyspnea. An expert sonographer blinded to patient data and lung ultrasound interpretation reviewed images and provided an expert interpretation. Interobserver agreement was performed between the study physician and expert physician interpretation. Cumulative sum analysis was used to determine the number of scans required to attain an acceptable level of training.

Results: Score points were significantly improved in post-test and after 6 months compared to pre-test (P value < 0.01) and was significantly improved after 6 months compared to post-test (P value < 0.001).

Conclusion: After the 3 h training, the majority of physicians novice to LUS achieved proficiency with interpretation of lung ultrasound after less than five ultrasound examinations performed independently.

References:
1. Zanobetti M, Scorpiniti M, Gigli C, Nazerian P, Vanni S, Innocenti F, et al. Point-of-care ultrasonography for evaluation of acute dyspnea in the ED. Chest. 2017; 151:1295–301.
2. Pivetta E, Goffi A, Lupia E, Tizzani M, Porrino G, Ferreri E, et al. Lung ultrasound-implemented diagnosis of acute decompensated heart failure in the ED. Chest. 2015; 148:202–10.
3. Lichtenstein DA. Lung ultrasound in the critically ill. Annals of intensive care. 2014; 4:1.
4. Ünlüer EE, Karagöz A, Oyar O, Vandenberk N, Kiyancıçek S, Budak F. Lung ultrasound by emergency nursing as an aid for rapid triage of dyspneic patients: a pilot study. International emergency nursing. 2014; 22:226–31.

Red cell distribution width (RDW) as a new modality in diagnosis and prognosis of ventilator-associated pneumonia (VAP)
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Background: Ventilator-associated pneumonia (VAP) is a prevalent nosocomial infection in intensive care units...
(ICUs), with a high death rate, a prolonged stay in the ICU, and an increased health care expense.

Objectives: The goal of this study was to assess the diagnostic and prognostic value of Red Cell Distribution (RDW) in VAP.

Method: This prospective cohort observational study was established on 106 critically ill mechanically ventilated patients who referred to ICU. They were classified into two groups: VAP (31 patients) and non VAP (75 patients) group. Clinical pulmonary infection score (CPIS), sputum culture results, ICU stay period, incidence of 28th day morality, acute physiology and chronic health evaluation (APACHE) II score, antibiotics and laboratory test including (PCT: at day of admission, within 7 days after admission in suspected VAP cases, RDW: was analyzed daily from admission until VAP diagnosis within 7 days from the day of admission and CRP: was analyzed daily from admission until VAP diagnosis within 7 days from the day of entrance).

Results: There was a positive signiﬁcant correlation between RDW at time of diagnosis and CPIS (r = 0.247, P = 0.04) and between RDW at time of diagnosis and APACHE (r = 0.476, P < 0.001). RDW at time of diagnosis and Delta RDW was signiﬁcantly higher in non-survivors’ group than survivors’ group (P = 0.020, p = 0.021 respectively). RDW was at cut-off >16.3 signiﬁcantly predict mortality with sensitivity of 84.62, speciﬁcity was 52.69, positive predictive value (PPV) was

Figure 1: ROC curves of RDW, CRP, procalcitonin in and of delta RDW, delta CRP, delta procalcitonin diagnosis of VAP

Figure 2: ROC curves of RDW, CRP, procalcitonin and of delta RDW, delta CRP, delta procalcitonin to predict mortality

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20, predictive value (NPV) was 96.1, area under the curve (AUC) was 0.806 and P value was <0.001. There was a positive significant correlation between RDW and delta RDW at time of diagnosis and duration of mechanical ventilation MV (r = 0.317, r = 0.398 respectively and P < 0.001) and between delta RDW and ICU stay (r = 0.279, P = 0.004).

Conclusion: RDW at time of diagnosis and delta RDW are good diagnostic and prognostic markers of (VAP) and better than c-reactive protein (CRP) and procalcitonin. RDW is correlated to duration of mechanical ventilation, CPIS, APACHE, and 28th day mortality.

Table format if included:

References:
1. Torres A, Niederman MS, Chastre J, Ewig S, Fernandez-Vandellos P, Hanberger H, et al. International ERS/ESICM/ESCMID/ALAT guidelines for the management of hospital-acquired pneumonia and ventilator-associated pneumonia. Guidelines for the management of hospital-acquired pneumonia (HAP)/ventilator-associated pneumonia (VAP) of the European Respiratory Society (ERS), European Society of Intensive Care Medicine (ESICM), European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and Asociación Latinoamericana del Tórax (ALAT). 2017; 50:1700582.
2. Jandial A, Kumar S, Bhalla A, Sharma N, Varma N, Varma S. Elevated Red Cell Distribution Width as a Prognostic Marker in Severe Sepsis: A Prospective Observational Study. Indian J Crit Care Med. 2017; 21:552–62.
3. Elkolaly R, Bahr H, El-Shafey B, Basuoni A, Elber E. Incidence of ventilator-associated pneumonia: Egyptian study. Egypt J Bronchol. 2019; 13:258–66.
4. Othman HA, Gamil NM, Elgazzar AEM, Fouad TA. Ventilator associated pneumonia, incidence and risk factors in emergency intensive care unit Zagazig university hospitals. Egypt J Chest Dis Tuberc. 2017; 66:703–8.
5. Yousef YA, Manal MA. The relationship between level of the red cell distribution width and the outcomes of patients who acquired pneumonia from community. Egypt J Bronchol. 2019; 13:738–42.
6. Fawzi HMAER, Said SGA, Saleh AN, Elnabi HOA. Red cell Distribution Width as a Prognostic Predictor in Ventilator Associated Pneumonia. QJM: An International Journal of Medicine. 2021;114.

Web-based ecg educational program in undergraduate medical students

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Background: Physicians in most clinical specialties, including general practice are expected to have a sufficient knowledge about ECG interpretation to be able to make accurate diagnoses, decide on patient management or further referrals.

Objectives: The aim of this project was to compare between conventional method and web-based comprehensive ECG interpretation for medical students.

Method: This observational cohort study included 90 undergraduate medical students. Students were randomized and equally divided into three groups: Conventional ECG group (control group): students without access to the ECG-program but with conventional teaching. Web based ECG group: students with access to the ECG-program, and Combined method group; teaching was by both conventional and web-based ECG. Participants were subjected to a test right after the end of the course and after 3 months and their points will be recorded.

Results: Score points were significantly improved in combined method and web-based ECG groups compared to conventional group (P value < 0.05) but was insignificantly different between web-based ECG group and combined method group. Participants scored better points at the end of the course than after 3 months.

Conclusion: Web-based ECG-interpretation program is a useful instrument to learn ECG. Participants learned through web and traditionally scored better results more than web or tradition only.

Table format if included:

| TABLE 1: Score points of the studied groups |
|--------------------------------------------|
| Conventional ECG (n = 30) | Web based ECG (n = 30) | Combined method (n = 30) | P value | P# |
|---------------------------|------------------------|--------------------------|---------|----|
| Score points at the end of the course | 21.47 ± 8.42 | 30.27 ± 4.51 | 33.93 ± 6.44 | <0.001* | P1 < 0.001* | P2 < 0.001* | P3 = 0.089 |
| Score points after 3 months | 16.20 ± 6.34 | 24.80 ± 7.25 | 28.57 ± 5.99 | <0.001* | P1 < 0.001* | P2 < 0.001* | P3 = 0.062 |

Data are presented as mean ± SD
The deadly melody

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Introduction: Dyspnea is a common complaint that brings patients to casualty, which commonly accompanied by abnormal breath sounds. It is crucial to recognize these abnormal sounds in order to provide the correct diagnosis and treatment plan.

Case descriptions: A 36-year-old male with a history of pulmonary tuberculosis (PTB) and laryngopharyngeal reflex (LPR) presented to our casualty with a sudden onset of dyspnea. Initial examination revealed that he was tachypneic with respiratory rate of 50/min, SPO2 of 88% on air. There were generalized ronchi on lung auscultation. Immediate treatment given was of severe exacerbation of obstructive airway disease, in which he poorly responded. On further evaluation, he had hoarseness of voice and stridor on inspiration. Treatment then was tailored towards upper airway obstruction, in which ENT team was referred urgently. Nasal endoscopy showed severe vocal cord edema and planned for emergency tracheostomy.

Discussions: Stridor is an abnormal, high pitched, musical breath sound during inspiration caused by partial obstruction in the upper airway (1) whereas wheeze is a continuous high-pitched sound with musical quality during expiration (2). The commonest local cause of stridor are vocal cord diseases (VCD) (3). Both stridor and wheezing are medical emergencies with different management depending on its cause. VCD may mimic or coexist with asthma or COAD and can benefit from medical therapy. However, failed medical therapy should prompt surgical airway intervention (4).

Conclusions: Differentiating upper and lower airway diseases can be challenging in acute setting. Understanding the differences with good clinical correlation ensures redirection of immediate management when one fails to improve the clinical condition of the patient.

References:
1. Maloney E, Meakin GH. Acute stridor in children. Continuing Education in Anesthesia, Critical Care & Pain. 2007 Dec 1;7(6):183–6.
2. Brand PL, Baraldi E, Bisgaard H, Boner AL, Castro-Rodriguez JA, Custovic A, de Blic J, De Jongste JC, Eber E, Everard ML, Frey U. Definition, assessment and treatment of wheezing disorders in preschool children: an evidence-based approach. European Respiratory Journal. 2008 Oct 1;32(4):1096–110.
3. Zochios V, Protopapas AD, Valchanov K. Stridor in adult patients presenting from the community: An alarming clinical sign. Journal of the Intensive Care Society. 2015 Aug;16(3):272–3.
4. Kenn K, Balkissoon R. Vocal cord dysfunction: what do we know? European Respiratory Journal. 2011 Jan 1;37(1):194–200.

The scarred heart

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Introduction: Fragmented QRS complex (QRSf) is a good electrocardiographic marker that has been associated with myocardial scarring, ischemia or fibrosis which can presents as sudden death in a healthy individual.

Descriptions: A healthy 72-year-old lady presented to our casualty with pre-syncopal episode preceded by chest tightness and dyspnoea, which gradually resolves prior to arrival. All systemic examinations were unremarkable, vitals were stable, and full blood panels were normal. ECG showed sinus rhythm with noticeably QRSf over the inferior leads. One hour later, she developed cardiac arrest, which failed to achieve ROSC despite CPR.

Discussions: QRSf is defined as the presence of an additional R wave (R′) or notching in the nadir of the S wave, or the presence of ≥1 R′ in 2 contiguous leads, corresponding to a major coronary artery territory on a 12-lead ECG (1). It is associated with myocardial scarring and fibrosis caused mainly by coronary artery disease (CAD) (2). Studies reported higher sensitivity of QRSf than Q-wave for detecting myocardial scar and suggested that QRSf is a good predictor of cardiac events among patients with CAD (4) especially in non-Q-wave MI (6) as Q-wave may disappear over time (3,5). It can be used as a marker of past MI and associated with cardiac motion wall abnormalities (7), higher cardiac event and mortality rate (8,9).
Conclusions: QRSf is a reliable indicator for myocardial scarring with good sensitivity for ischemic heart disease. Its incorporation in daily clinical practice adds an non-invasive, easily valuable marker that might raise the probability of CAD.

References:
1. Das MK, Khan B, Jacob S, Kumar A, Mahenthiran J. Significance of a fragmented QRS complex versus a Q wave in patients with coronary artery disease. Circulation. 2006 May 30;113(21):2495-501.
2. Das MK, Maskoun W, Shen C, Michael MA, Suradi H, Desai M, Subbarao R, Bhakta D. Fragmented QRS on twelve-lead electrocardiogram predicts arrhythmic events in patients with ischemic and nonischemic cardiomyopathy. Heart rhythm. 2010 Jan 1;7(1):74-80.
3. Pietrasik G, Zaręba W. QRS fragmentation: diagnostic and prognostic significance. Cardiology journal. 2012;19(2):114-21.
4. Yang H, Pu M, Rodriguez D, Underwood D, Griffin BP, Kalahasti V, Thomas JD, Brunken RC. Ischemic and viable myocardium in patients with non–Q-wave or Q-wave myocardial infarction and left ventricular dysfunction: a clinical study using positron emission tomography, echocardiography, and electrocardiography. Journal of the American College of Cardiology. 2004 Feb 18;43(4):592-8.
5. Voon WC, Chen YW, Hsu CC, Lai WT, Sheu SH. Q-wave regression after acute myocardial infarction assessed by TI-201 myocardial perfusion SPECT. Journal of nuclear cardiology. 2004 Mar;11(2):165-70.
6. Abdulla J, Brendorp B, Torp-Pedersen C, Køber on behalf of the TRACE study group L. Does the electrocardiographic presence of Q waves influence the survival of patients with acute myocardial infarction? European heart journal. 2001 Jun 1;22(12):1008-14.
7. Reddy CV, Cheriparambill K, Saul B, Makan M, Kassotis J, Kumar A, Das MK. Fragmented left sided QRS in absence of bundle branch block: sign of left ventricular aneurysm. Annals of noninvasive electrocardiology. 2006 Apr;11(2):132-8.
8. Das MK, Saha C, El Masry H, Peng J, Dandamudi G, Mahenthiran J, McHenry P, Zipes DP. Fragmented QRS on a 12-lead ECG: a predictor of mortality and cardiac events in patients with coronary artery disease. Heart rhythm. 2007 Nov 1;4(11):1385-92.
9. Torigoe K, Tamura A, Kawano Y, Shinozaki K, Kotoku M, Kadota J. The number of leads with fragmented QRS is independently associated with cardiac death or hospitalization for heart failure in patients with prior myocardial infarction. Journal of cardiology. 2012 Jan 1;59(1):36-41.

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Improving sepsis recognition in the community and early hospital environment. What can we learn?

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Introduction: Despite Australia being a highly developed country it lacks behind its peers in recognition and outcomes for sepsis in patients. Available data for the burden of Sepsis on the countries healthcare system is unknown, however data has shown 18,000 intensive care admissions annually resulting in 5000 deaths [1].

Description: Early recognition of Sepsis has been shown to be crucial in improving patient outcomes, with absolute risk of mortality increasing by 7% every hour. Currently only 40% of Australians have heard of Sepsis with only 14% able to recognize its signs [2]. Accordingly, the most vulnerable in Australian society are those with the poorest outcomes, those with comorbidities, the elderly, the very young, the socio-economically deprived and those Aboriginal and Torres Strait Islander backgrounds at greatest risk. We examine programs initiated at the state level and in other countries and examine the methodology of successful sepsis reduction programs.

Outcomes: The most common reason for poor outcomes in patients with Sepsis has been shown to be: Poor early recognition by both patient (59.4%) and clinician (55.4%, rising to 66.0% for recognizing severe sepsis) and lack of prompt review by a senior clinician (40.1%). Areas of improvement in the emergency department include investigations (25.7%), treatment planning (31.7%) and monitoring (36.9%)[3].

Conclusions: Improvements to Sepsis management include the establishment of national action plans to coordinate with Sepsis leads at hospitals, leading to improved recognition of sepsis, the prompt prescribing of antibiotics and adoption of successful treatment programs such as “Sepsis six bundle” from the UK can improve outcomes[4].

Impact of air temperature on occurrence of bath-related cardiac arrest

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Background: The mortality of the bath-related cardiac arrest (BRCA) is extremely high. [1,2] While air temperature is reported to be associated with the BRCA occurrence, it is unclear whether daily minimum temperatures or the difference between maximum and minimum air temperatures influences BRCA occurrence the most.

Objectives: This study aimed to examine the impact of air temperature parameters on the occurrence of BRCA.

| TABLE 1. Comparison of patients with BRCA and non-BRCA groups |
|---------------------------------------------------------------|
| BRCA n = 25 | Non-BRCA n = 190 | p    |
|-------------|-----------------|------|
| Male, n (%) | 21 (84.0)       | 134 (70.5) | 0.24 |
| Age, median (range), years | 75 (69–80)       | 69 (60–81) | 0.15 |
| Daily max. temperature, median (range), °C | 8.30 (5.1–13.1) | 13.2 (3.0–22.4) | 0.24 |
| Daily min. temperature, median (range), °C | 1.2 (-3.0–3.7) | 2.15 (-2.9–12.0) | 0.12 |
| Temperature difference, median (range), °C | 7.7 (5.9–11.5) | 8.30 (5.7–10.6) | 0.89 |
| Shockable cardiac rhythm, n (%) | 1 (4.0) | 85 (44.7) | < 0.01 |
| ROSC, n (%) | 2 (8.0) | 66 (34.7) | 0.01 |
| Overall mortality, n (%) | 24 (96.0) | 136 (71.6) | 0.01 |

BRCA, bath-related cardiac arrest; ROSC, return of spontaneous circulation

References:
1. Schlapbach L, Thompson K, Finfer S. The WHO resolution on sepsis: what action is needed in Australia? Medical Journal of Australia. 2019;211(9):395.
2. News Archives - Page 11 of 13 - Australian Sepsis Network [Internet]. Australian Sepsis Network. 2016 [cited 3 February 2022]. Available from: https://www.australiansepsisnetwork.net.au/category/news/page/11
3. National Confidential Enquiry into Patient Outcome and Death Just Say Sepsis! A review of the process of care received by patients with sepsis. London:: NCEPOD; 2015.
4. Daniels R, Nutbeam T, McNamara G, Galvin C. The sepsis six and the severe sepsis resuscitation bundle: a prospective observational cohort study. Emergency Medicine Journal. 2011Jun 1;28(6):507–12
Method: A retrospective cohort study of adult patients was conducted between January 2015 and February 2020 at Hirosaki University Hospital Emergency Department. The following data were collected: age, sex, day of cardiac arrest event, location of the event, initial cardiac rhythm, presence of return of spontaneous circulation, and overall mortality (status at 1 month after cardiac arrest event). Based on the day of the event and the location in which the event occurred, daily minimum and maximum temperatures were obtained from the Japan Meteorological Agency database.

Results: A total of 215 eligible cardiac arrest cases were identified, including 25 cases of BRCA. Comparing BRCA and non-BRCA, initial shockable cardiac rhythm (4.0% vs 44.7%), presence of return of spontaneous circulation (8.0% vs 34.7%), and overall mortality (96.0% vs 71.6%) differed significantly (P < .05 each). Daily minimum and maximum temperatures showed no significant relationships with BRCA or non-BRCA. Daily minimum temperature was a risk factor of BRCA occurrence after adjusting for age and temperature difference (risk ratio, 0.937; 95% confidence interval, 0.882–0.995).

Conclusion: Daily minimum temperature represents a potential risk factor for BRCA occurrence.

References:
1. Uhlig K, Balk EM, Earley A, Persson R, Garlitski AC. Assessment on implantable defibrillators and the evidence for primary prevention of sudden cardiac death [Internet]. National Center for Biotechnology Information. U.S. National Library of Medicine; 2013 [cited 2022Jan10]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK248310/
2. Caution for bath-related accidents in the elderly, frequently occurs during the winter season [Internet]. Consumer Affairs Agency, Government of Japan. [cited 2022Jan10]. Available from: https://www.caa.go.jp/policies/policy/consumer_safety/caution/caution_013/.

Night aeromedical crew activity before and after the introduction of retrieval specialists to tasking and co-ordination in central Australia

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Introduction: Aeromedical retrieval services are used extensively in Central Australia due to the vast distances between communities, however there are inherent risks involved in aviation, and a retrospective study of aeromedical transport related incidents found that night flying was significantly associated with fatal crash or injury with an odds ratio of 11.2(1).

The tasking process for aeromedical assets in Central Australia was changed on 12/2/2018 with the commissioning of the Medical Retrieval and Consultation Center (MRaCC), when responsibility for tasking and clinical co-ordination transferred from rural GPs to critical care specialists with PHRM experience.

Description: Routinely collected operational data was examined retrospectively in this study. Night crew activity for two years before and after the commissioning of MRaCC was compared (control period: 12/2/2016–11/2/2018, intervention period 12/2/2018–11/2/2020).

| Time Period | Dates                     | Total shifts | Active shifts | Active percentage per year | Active percentage in time period |
|-------------|---------------------------|--------------|---------------|----------------------------|---------------------------------|
| Control     | 12/2/2016 – 11/2/2017     | 366          | 298           | 81.4%                      | 86.0%                           |
|             | 12/2/2017 – 11/2/2018     | 365          | 331           | 90.7%                      |                                 |
| Intervention| 12/2/2018 – 11/2/2019     | 365          | 306           | 83.8%                      | 79.6%                           |
|             | 12/2/2019 – 11/2/2020     | 365          | 275           | 75.3%                      |                                 |
Crew activity was recorded as a binary activated or not activated for all shifts for the primary outcome of demonstrating a reduction in night shift activity.

**Outcomes:** There was a highly statistical significant reduction in the proportion of night shifts where the crew was activated after the commissioning of MRaCC (86.0% vs 79.6%, p < 0.001).

**Conclusions:** The transfer of clinical co-ordination to retrieval specialists have resulted in a significant decrease in night crew activity, with likely aviation safety benefits.

**Reference:**
1. Hon HH, Wojda TR, Barry N, MacBean U, Anagnostakos JP, Evans DC, et al. Injury and fatality risks in aeromedical transport: focus on prevention. J Surg Res. 2016 Aug;204(2):297–303.

**Validation of the PECARN abdominal injury decision rule**

**James Holmes**

**Background/Introduction:** The PECARN intra-abdominal injury (IAI) rule was derived to identify children at very low risk for IAIs undergoing acute intervention (IAIai) such that computed tomography (CT) could be avoided.

**Objective:** To validate the PECARN IAI rule.

**Methods:** We prospectively enrolled children with blunt abdominal trauma to validate the PECARN rule in a new multicenter cohort. Clinicians documented if the rule was positive/negative prior to CT, if obtained. The rule included abdominal wall trauma, Glasgow Coma Scale ≤13, abdominal tenderness, complaints of abdominal pain, evidence of thoracic wall trauma, decreased breath sounds, or history of vomiting. IAIai included an IAI with either therapeutic laparotomy, angiographic embolization, blood transfusion for abdominal hemorrhage, or intravenous fluid for ≥2 nights for pancreatic/gastrointestinal injuries. To assess outcomes, children discharged home were contacted and admitted children were followed. Prediction rule characteristics for IAIai with 95% confidence intervals (CI) were calculated.

**Results:** We enrolled 6,298 (median age = 9 years, IQR 5, 13 years) and 57% were male. Of the 440 (7.0%) with IAIs, 126 (29%, 95% CI 24, 33%) had IAIai. The prediction rule had the following test characteristics for IAIai: sensitivity 126/126 (100%; 95% CI 97.7%, 100%), specificity 2,852/6,172 (46.2%; 95% CI 45.2%, 47.3%), negative predictive value 2,852/2,852 (100%; 95% CI 99.9%, 100%). In the 2,852 who were negative for the rule, 389 (13.6%, 95% CI 12.4, 15.0%) underwent CT.

**Conclusion:** The PECARN IAI rule was validated in a large multicenter population with excellent test characteristics. Implementation of this rule would further safely decrease CT use.

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**The hole of dome**

Amelia Jane Honorious

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**Introduction:** Diaphragmatic hernia is a rare occurrence in adults. It is infrequent for adults to have undiagnosed congenital diaphragmatic hernia until it showed symptoms.

**Case Description:** 49 year-old gentleman with history of pulmonary tuberculosis presented to Emergency Department Keningau with left sided chest discomfort for three days, associated with fever and intestinal obstruction symptoms. He denied dyspnea, chronic cough or recent trauma. However, he had history of lifting timber two months ago. On examination, lungs had left sided reduced air entry and abdomen was guarded. ECG showed sinus tachycardia. Bedside scan revealed bowel shadow in the left lung. Chest x-ray showed air fluid level over left lung with mediastinal shift and right tracheal deviation. Abdominal x-ray showed coffee-bean sign with air fluid level. CECT of the thorax, abdomen, and pelvis showed left diaphragmatic hernia with significant right mediastinal, tracheal, and cardiac shift under tension and small bowel obstruction.

**Discussion:** Diaphragmatic injury represents less than 1% of all traumatic injuries. Therefore, high index of
suspicion is needed to diagnose it as it can cause life threatening complications such as herniation and strangulation of abdominal organs. Direct injury to the diaphragm is by penetrating mechanism to the thoracoabdominal region such as stabs and gunshots. Indirect injury occurs when there is increased intra-abdominal pressure that is sufficient enough to overcome the strength of diaphragmatic tissue.

Conclusion: Clinicians should be aware of diaphragmatic hernia as it needs a high index of suspicion to be diagnosed in adults. Any conditions that cause increase in intra-abdominal pressure is a risk factor. Imaging evaluation is important and surgical intervention is needed once diagnosed.

References:
1. Fair KA, Gordon NT, Barbosa RR, Rowell SE, Watters JM, Shreiber MA. Traumatic diaphragmatic injury in the American College of Surgeons National Trauma Data Bank: a new examination of a rare diagnosis. Am J Surg. 2015;209(5):864
2. Wiencek RG Jr, Wilson RF, Steiger Z. Acute injuries of the diaphragm. J Thoracic Cardiovascular Surg. 1986;92(6):989
3. Shah R, Sabanathan S, Mearns AJ, Choudhury AK. Traumatic rupture of diaphragm. Annals Thoracic Surg.1995;60(5):1444–9
4. Athanassiadi K, Kalavrouziotis G, Athanassiou M, Vernikos P, Skrekas G, et al. Blunt diaphragmatic rupture. European Journal of Cardio-thoracic Surgery.1999;15(4):469–474

Evaluating EMS providers’ ability and willingness to respond to emergencies resulting from bioterrorist attacks

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Background: Previous studies have found that public health systems are inadequately prepared for an act of biological terrorism. As the COVID-19 pandemic continues, few studies have evaluated bioterrorism preparedness of Emergency Medical Services, even in the accelerating environment of biothreats.

Objectives: The aim of the study is to investigate Nebraska’s Emergency Medical Services providers’ clinical and administrative competencies to manage a bioterrorism attack and to determine their willingness to respond to such an incident. Additionally this study will assess the current level of preparedness of Nebraska’s Emergency Medical Service structure to identify and manage a
### TABLE 1. Administrative Competencies (AC) and Clinical Competencies (CC)\(^{11}\)

| Administrative Competency | Description |
|---------------------------|-------------|
| Administrative Competency 1 | Describe the role of your workplace in an emergency response |
| Administrative Competency 2 | Identify the chain of command in emergency response |
| Administrative Competency 3 | Identify and locate the agency’s emergency management plan |
| Administrative Competency 4 | Describe his/her functional role(s) in emergency response and participate in these role(s) during regular drills |
| Administrative Competency 5 | Demonstrate the correct use of communication equipment used for emergency communication. (phone, fax, radio, satellite phone) |
| Administrative Competency 6 | Ability to locate the communication role(s) in emergency response plan and understand his/her role |
| Administrative Competency 7 | Identify limits to own knowledge, skill, and authority, and identify key system resources for referring matters that exceed these limits |
| Administrative Competency 8 | Demonstrate creative problem solving and flexible thinking to unusual challenges within his/her functional responsibilities to respond to a bioterrorism event |

| Clinical Competency | Description |
|---------------------|-------------|
| Clinical Competency 1 | Describe his/her expected clinical role in bioterrorism response for the specific practice setting as a part of the institution or community response |
| Clinical Competency 2 | Respond to an emergency within the emergency management system of his/her practice, institution and community |
| Clinical Competency 3 | Recognize an illness or injury as potentially resulting from exposure to a biological, chemical or radiological agent possibly associated with a terrorist event |
| Clinical Competency 4 | Ability to report identified cases or events to the public health authorities to facilitate surveillance and investigation using the established institutional or local communication protocol |
| Clinical Competency 5 | Initiate patient care within his/her professional scope of practice and arrange for prompt referral appropriate to the identified condition(s) |
| Clinical Competency 6 | Communicate risks and actions taken to patients and concerned others clearly and accurately |
| Clinical Competency 7 | Recognize and manage the psychological impact of a Bioterrorism event on victims and health care professionals, as appropriate to the event |
| Clinical Competency 8 | Recognize unusual events that might indicate an emergency and describe appropriate action |

### TABLE 2. Nebraska’s Healthcare Providers’ Demographics

| Age (n =190) | Doctor (MD or DO) (%) | Registered Nurse (%) | Paramedic (%) | EMT (%) | Other First Responder (%) |
|-------------|-----------------------|----------------------|--------------|---------|--------------------------|
| 19–24       | 0 (0.0)               | 0 (0.0)              | 0 (0.0)      | 1 (0.8) | 0 (0.0)                  |
| 25–34       | 0 (0.0)               | 2 (20)               | 6 (12.8)     | 8 (6.3) | 1 (33.3)                 |
| 35–44       | 1 (50)                | 1 (10)               | 10 (21.3)    | 30 (23.4)| 1 (33.3)                 |
| 45–54       | 1 (50)                | 6 (60)               | 15 (31.9)    | 33 (25.8)| 0 (0.0)                  |
| 55–64       | 0 (0.0)               | 0 (0.0)              | 13 (27.7)    | 42 (32.8)| 1 (33.3)                 |
| 65 or older | 0 (0.0)               | 1 (10)               | 3 (6.4)      | 14 (10.9)| 0 (0.0)                  |

(Continues)
|                         | Doctor (MD or DO) (%) | Registered Nurse (%) | Paramedic (%) | EMT (%) | Other First Responder (%) |
|-------------------------|-----------------------|----------------------|---------------|---------|--------------------------|
| **Gender** (n = 190)    |                       |                      |               |         |                          |
| Male                    | 0 (0.0)               | 0 (0.0)              | 39 (83)       | 63 (49.2) | 3 (100)                  |
| Female                  | 2 (100)               | 9 (90)               | 8 (17)        | 65 (50.8) | 0 (0.0)                  |
| Prefer not to say       | 0 (0.0)               | 1 (10)               | 0 (0.0)       | 0 (0.0)  | 0 (0.0)                  |
| **Race** (n = 189)      |                       |                      |               |         |                          |
| White                   | 2 (100)               | 9 (90)               | 44 (93.6)     | 125 (98.4) | 3 (100)                  |
| Black or African American | 0 (0.0)            | 0 (0.0)              | 1 (2.1)       | 0 (0.0)  | 0 (0.0)                  |
| American Indian or Alaska Native | 0 (0.0) | 0 (0.0) | 1 (2.1) | 1 (0.8) | 0 (0.0) |
| Native Hawaiian or Pacific Islander | 0 (0.0) | 1 (10) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Other                   | 0 (0.0)               | 0 (0.0)              | 1 (2.1)       | 1 (0.8)  | 0 (0.0)                  |
| **Highest degree** (n = 190) |                      |                      |               |         |                          |
| High School Diploma     | 0 (0.0)               | 0 (0.0)              | 3 (6.4)       | 20 (15.6) | 0 (0.0)                  |
| Associate’s Degree      | 0 (0.0)               | 3 (30)               | 20 (42.6)     | 40 (31.3) | 1 (33.3)                 |
| Bachelor’s Degree       | 0 (0.0)               | 5 (50)               | 12 (25.5)     | 33 (25.8) | 1 (33.3)                 |
| Graduate Degree - Non-doctorate (MS, MA, etc.) | 0 (0.0) | 1 (10) | 4 (8.5) | 7 (5.5) | 0 (0.0) |
| Doctorate               | 2 (100)               | 0 (0.0)              | 0 (0.0)       | 3 (2.3)  | 0 (0.0)                  |
| Some College            | 0 (0.0)               | 0 (0.0)              | 8 (17)        | 25 (19.5) | 1 (33.3)                 |
| Some high school        | 0 (0.0)               | 1 (10)               | 0 (0.0)       | 0 (0.0)  | 0 (0.0)                  |
| **Years worked as an Emergency Medical Services provider** (n = 190) |                      |                      |               |         |                          |
| 1 to 2 years            | 0 (0.0)               | 0 (0.0)              | 0 (0.0)       | 2 (1.6)  | 0 (0.0)                  |
| 3 to 5 years            | 1 (50)                | 3 (30)               | 1 (2.1)       | 5 (3.9)  | 0 (0.0)                  |
| 6 to 10 years           | 0 (0.0)               | 2 (20)               | 6 (12.8)      | 19 (14.8) | 1 (33.3)                 |
| 11 to 20 years          | 1 (50)                | 3 (30)               | 10 (21.3)     | 42 (32.8) | 2 (66.7)                 |
| Over 20 years           | 0 (0.0)               | 2 (20)               | 30 (63.8)     | 60 (46.9) | 0 (0.0)                  |

* n is based on the number of completions of each question
### TABLE 3. Nebraska EMS Providers’ Work Place Demographics

| Category                        | Doctor (MD or DO) (%) | Registered Nurse (%) | Paramedic (%) | EMT (%) | Other First Responder (%) |
|---------------------------------|-----------------------|----------------------|---------------|---------|--------------------------|
| **I am currently (n = 189)**    |                       |                      |               |         |                          |
| Employed in EMS                 | 0(0.0)                | 1(10)                | 30(65.2)      | 12      | 0(0.0)                   |
| Volunteering in EMS             | 1(50)                 | 8(80)                | 13(28.3)      | 113(88.3)| 2(66.7)                  |
| Retired from EMS                | 0(0.0)                | 0(0.0)               | 0(0.0)        | 2(1.6)  | 0(0.0)                   |
| Non-operational EMS member      | 1(50)                 | 1(10)                | 3(6.5)        | 1(0.8)  | 1(33.3)                  |
| **Primary work place (n = 189)**|                       |                      |               |         |                          |
| Hospital Based-EMS              | 0(0.0)                | 1(10)                | 3(6.4)        | 392.3   | 0(0.0)                   |
| Fire-Based EMS                  | 0(0.0)                | 0(0.0)               | 24(51.1)      | 20(15.6)| 1(33.3)                  |
| Volunteer EMS                   | 1(100)                | 8(80)                | 11(23.4)      | 102(79.7)| 2(66.7)                  |
| Municipal EMS                   | 0(0.0)                | 0(0.0)               | 4(8.5)        | 0(0.0)  | 0(0.0)                   |
| Private EMS                     | 0(0.0)                | 1(10)                | 5(10.6)       | 3(2.3)  | 0(0.0)                   |
| **Primary provider level (n = 189)**|                       |                      |               |         |                          |
| ALS                             | 0(0.0)                | 3(30)                | 43(91.5)      | 14(10.9)| 0(0.0)                   |
| BLS                             | 1(100)                | 7(70)                | 4(8.5)        | 114(89.1)| 3(100)                   |
| **Average 2019–2020 (calendar year 2019) patient care encounter (n = 189)** | | | | | |
| Less than 999                   | 1(100)                | 8(80)                | 24(51.1)      | 119(93) | 2(66.7)                  |
| 1,000–1,999                     | 0(0.0)                | 0(0.0)               | 10(21.3)      | 7(5.5)  | 1(33.3)                  |
| 2,000–2,999                     | 0(0.0)                | 1(10)                | 3(6.4)        | 0(0.0)  | 0(0.0)                   |
| 3,000–3,999                     | 0(0.0)                | 0(0.0)               | 3(6.4)        | 2(1.6)  | 0(0.0)                   |
| 4,000 or more                   | 0(0.0)                | 1(10)                | 7(14.9)       | 0(0.0)  | 0(0.0)                   |
| **Community Type (n = 190)**    |                       |                      |               |         |                          |
| Rural                           | 2(100)                | 8(80)                | 32(68.1)      | 114(89.1)| 3(100)                   |
| Urban                           | 0(0.0)                | 1(10)                | 5(10.6)       | 6(4.7)  | 0(0.0)                   |
| Suburban                        | 0(0.0)                | 1(10)                | 10(21.3)      | 8(6.3)  | 0(0.0)                   |
| **Population size (n = 190)**   |                       |                      |               |         |                          |
| Small City                      | 2(100)                | 10(100)              | 30(63.8)      | 119(93) | 3(100)                   |

(Continues)
TABLE 3 (Continued)

| Doctor (MD or DO) (%) | Registered Nurse (%) | Paramedic (%) | EMT (%) | Other First Responder (%) |
|-----------------------|----------------------|---------------|---------|--------------------------|
| (Less than 25,000 persons) | 0(0.0) | 0(0.0) | 12(25.5) | 7(5.5) | 0(0.0) |
| Medium City (25,000 to 75,000 persons) | 0(0.0) | 0(0.0) | 5(10.6) | 2(1.6) | 0(0.0) |
| Large City (Greater than 75,000 persons) | 0(0.0) | 0(0.0) | 5(10.6) | 2(1.6) | 0(0.0) |

TABLE 4. Administrative Competency Levels of Nebraska EMS Providers

| All healthcare Providers | Doctor (MD or DO) (%) | Registered Nurse (%) | Paramedic (%) | EMT (%) |
|--------------------------|-----------------------|----------------------|---------------|---------|
| AC1 86(56.2) 1(100) | 3(50) | 31(79.49) | 50(47.17) |
| AC2 111 (72.5) 1(100) | 4(66.67) | 32(82.06) | 73(68.87) |
| AC3 87 (56.5) 0(0) | 3(42.86) | 23(58.98) | 60(56.61) |
| AC4 33 (21.6) 0(0) | 0(0) | 11(28.95) | 21(19.82) |
| AC5 139 (73.2) 1(50) | 6(60) | 38(80.86) | 93(72.66) |
| AC6 68 (44.4) 0(0) | 3(42.86) | 19(48.72) | 45(42.86) |
| AC7 111 (73.5) 1(100) | 6(100) | 32(84.22) | 71(67.62) |
| AC8 14(9.1) 0(0) | 11(28.21) | 3(2.83) |

AC1: Describe your work place’s role in an emergency response. AC2: Identify the chain of command in emergency response.
AC3: Identify and locate the agency’s emergency management plan.
AC4: Describe his/her functional role(s) in emergency response and participate in these role(s) during regular drills. AC5: Demonstrate the correct use of communication equipment used for emergency communication. (Phone, fax, radio, satellite phone)
AC6: Ability to locate the communication role(s) in the emergency response plan and understand his/her role.
AC7: Identify limits to own knowledge, skill, and authority, and identify key system resources for referring matters that exceed these limits.
AC8: Demonstrates creative problem solving and flexible thinking to unusual challenges within his/her functional responsibilities to respond to a bioterrorism event.

Identifying the current level of preparedness, capabilities, and willingness of responders to provide services during a bioterror attack will provide the Department of Health and Human Services and Office of Emergency Medical Services with insights into any areas of improvement within the state. This study can inform future policy to better allocate staff and resources and to better manage mobilization of efforts to ensure a safe and effective response to a bioterror attack within Nebraska. Finally, the findings in the study can direct future training development to adequately respond to a public health crisis.
This study utilized an Internet-based survey to assess the level of preparedness and willingness to respond to a bioterrorism attack, and identify factors that predict preparedness and willingness among Nebraska EMS providers. The survey was available for one month in 2021 during which 190 EMS providers responded to the survey.

Results: Only 56.8% of providers were able to recognize an illness or injury as potentially resulting from exposure to a CBRN agent. The provider Clinical Competency levels range from a low of 13.6% (ability to initiate patient care within his/her professional scope of practice and arrange for prompt referral appropriate to the identified condition(s)) to a high of 74% (the ability to respond to an emergency within the emergency management system of his/her practice, institution and community). Only 10% of the respondents are both willing and able to effectively function in a bioterror environment.

Conclusion: In order to effectively prepare for and respond to a bioterrorist attack, all levels of the healthcare system need to have the clinical skills, knowledge, and abilities necessary to treat patients exposed. Policy changes and increased focus on training and drills are needed to ensure a prepared EMS system which is crucial to a resilient state. EMS entities need to be aware of the extent of their available workforce so that the country can be prepared for the increasing threat of bioterrorism or other novel emerging infectious disease outbreaks. A resilient nation relies on a prepared set of EMS providers who are willing to respond to biological terrorism events.

Table format if included:

### TABLE 5. Clinical Competency Levels of Nebraska Healthcare Providers

|                      | All healthcare Providers | Doctor (MD or DO) (%) | Registered Nurse (%) | Paramedic (%) | EMT (%) |
|----------------------|--------------------------|-----------------------|---------------------|---------------|---------|
| CC1                  | 52(33.8)                 | 1(100)                | 6(31.58)            | 33(84.62)     | 68(34.21) |
| CC2                  | 108(56.8)                | 2(100)                | 6(31.58)            | 32(68.09)     | 68(34.21) |
| CC3                  | 96(47.8)                 | 1(100)                | 6(31.58)            | 32(68.09)     | 68(34.21) |
| CC4                  | 63(33.8)                 | 1(100)                | 6(31.58)            | 32(68.09)     | 68(34.21) |
| CC5                  | 20(10.6)                 | 1(100)                | 6(31.58)            | 32(68.09)     | 68(34.21) |
| CC6                  | 23(12.3)                 | 0(0)                  | 6(31.58)            | 32(68.09)     | 68(34.21) |
| CC7                  | 59(32.8)                 | 1(100)                | 6(31.58)            | 32(68.09)     | 68(34.21) |
| CC8                  | 62(34.3)                 | 0(0)                  | 6(31.58)            | 32(68.09)     | 68(34.21) |

CC1: Describe his/her expected clinical role in bioterrorism response for the specific practice setting as a part of the institution or community response.

CC2: Respond to an emergency within the emergency management system of his/her practice, institution, and community.

CC3: Recognize an illness or injury as potentially resulting from exposure to a biological, chemical, or radiological agent possibly associated with a terrorist event.

CC4: Ability to report identified cases or events to the public health authorities to facilitate surveillance and investigation using the established institutional or local communication protocol.

CC5: Initiate patient care within his/her professional scope of practice and arrange for prompt referral appropriate to the identified condition(s).

CC6: Communicate risks and actions taken to patients and concerned others clearly and accurately.

CC7: Recognize and manage the psychological impact of a Bioterrorism event on victims and health care professionals, as appropriate to the event.

CC8: Recognize unusual events that might indicate an emergency and describe appropriate action.

### TABLE 6. Weighted Bioterrorism Competency Levels Scores for Nebraska’s Healthcare Providers

|                      | Mean | Mean |
|----------------------|------|------|
| AC1                  | .5621| CC1  | .3377|
| AC2                  | .7255| CC2  | .7403|
| AC3                  | .5649| CC3  | .5510|
| AC4                  | .2157| CC4  | .6429|
| AC5                  | .7092| CC5  | .1364|
| AC6                  | .4444| CC6  | .1494|
| AC7                  | .7351| CC7  | .3831|
| AC8                  | .0909| CC8  | .4026|
| ACL                  | .4941| CCL  | .4376|

BCL = 0.4569

Method: This study utilized an Internet-based survey to assess the level of preparedness and willingness to respond to a bioterrorism attack, and identify factors that predict preparedness and willingness among Nebraska EMS providers. The survey was available for one month in 2021 during which 190 EMS providers responded to the survey.

Results: Only 56.8% of providers were able to recognize an illness or injury as potentially resulting from exposure to a CBRN agent. The provider Clinical Competency levels range from a low of 13.6% (ability to initiate patient care within his/her professional scope of practice and arrange for prompt referral appropriate to the identified condition(s)) to a high of 74% (the ability to respond to an emergency within the emergency management system of his/her practice, institution and community). Only 10% of the respondents are both willing and able to effectively function in a bioterror environment.

Conclusion: In order to effectively prepare for and respond to a bioterrorist attack, all levels of the healthcare system need to have the clinical skills, knowledge, and abilities necessary to treat patients exposed. Policy changes and increased focus on training and drills are needed to ensure a prepared EMS system which is crucial to a resilient state. EMS entities need to be aware of the extent of their available workforce so that the country can be prepared for the increasing threat of bioterrorism or other novel emerging infectious disease outbreaks. A resilient nation relies on a prepared set of EMS providers who are willing to respond to biological terrorism events.

Table format if included:

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TABLE 7. Percentage of Nebraska Healthcare Providers Willing-to-Respond to a Bioterrorism Attack

| Proximity       | All Healthcare Providers | Registered Nurse | Paramedic | EMT |
|-----------------|--------------------------|------------------|-----------|-----|
|                 | High Risk (n = 147)      |                  |           |     |
| Local           | High Risk                | 114(77)          | 6(85.72)  | 33(89.19) | 73(71.57) |
|                 | Low Risk                 | 133(89.9)        | 6(85.72)  | 35(94.6)  | 90(88.24) |
| Regional        | High Risk                | 110(74.3)        | 6(85.72)  | 34(91.9)  | 68(66.67) |
|                 | Low Risk                 | 125(84.5)        | 6(85.72)  | 34(91.9)  | 83(81.38) |
| Statewide       | High Risk                | 83(56.1)         | 5(71.43)  | 27(72.98) | 50(49.02) |
|                 | Low Risk                 | 91(61.5)         | 5(71.43)  | 26(70.28) | 60(58.83) |
| Nationwide      | High Risk                | 50(33.8)         | 3(42.86)  | 15(40.55) | 32(31.38) |
|                 | Low Risk                 | 62(42.2)         | 3(42.86)  | 16 (43.25)| 43(42.58) |

*The total n does not include the “others” category of provider.

**High Risk Event** was defined as a bioterrorism agent that does NOT have a known treatment and/or vaccination.

**Low Risk Event** was defined as a bioterrorism agent that has a known treatment and/or vaccination. **Proximity** was defined as the distance from providers’ normal workplace to Ground Zero of the event.

**Local** was defined as the providers’ local community.

**Regional** was defined as counties surrounding the providers’ normal workplace.

**Statewide** was defined as responding anywhere in the State of Nebraska.

**Nationwide** was defined as responding anywhere in the United States.

References:
1. Vogel KM. 9. Biodefense. In: Biosecurity Interventions. Columbia University Press; 2008:227–256. doi:10.7312/lako14606–009
2. Caves Jr. JP, Carus WS. The Future of Weapons of Mass Destruction: Their Nature and Role in 2030.; 2014.
3. Sandberg A, Nelson C. Who Should We Fear More: Biohackers, Disgruntled Postdocs, or Bad Governments? A Simple Risk Chain Model of Bioterror. Heal Secur. 2020;18(3):155–163. doi:10.1089/hs.2019.0115
4. Cruickshank P, Rassler D. COVID-19 and Counterterrorism.; 2020. https://ctc.usma.edu/a-view-from-the-ct-foxhole-a-virtual-roundtable-on-covid-19-and-counterterrorism-with-audrey-kurth-cronin-lieutenant-general-ret-michael-nagata-magnus-ranstorp-ali-soufan-and-juan-zarate/
5. Veenema TG, Walden B, Feinstein N, Williams JP. Factors Affecting Hospital-based Nurses’ Willingness to Respond to a Radiation Emergency. Disaster Med Public Health Prep. 2008;2(4):224–229. doi:10.1097/DMP.0b013e31818a2b7a
6. DiGiovanni C. The Spectrum of Human Reactions to Terrorist Attacks with Weapons of Mass Destruction: Early Management Considerations. Prehosp Disaster Med. 2003;18(3):253–257. doi:10.1017/S1049023X0001138
7. Le AB, Buehler SA, Maniscalco PM, et al. Determining training and education needs pertaining to highly infectious disease preparedness and response: A gap analysis survey of US emergency medical services practitioners. Am J Infect Control. 2018;46(3):246–252. doi:10.1016/j.ajic.2017.09.024
8. Qureshi K. Health Care Workers’ Ability and Willingness to Report to Duty During Catastrophic Disasters. J Urban Heal Bull New York Acad Med. 2005;82(3):378–388. doi:10.1093/jurban/jti086
9. Cone DC, Cummings BA. Hospital disaster staffing: if you call, will they come? Am J Disaster Med. 1(1):28–36. http://www.ncbi.nlm.nih.gov/pubmed/18274041.
10. Chaffee M. Willingness of Health Care Personnel to Work in a Disaster: An Integrative Review of the Literature. Disaster Med Public Health Prep. 2009;3(1):42–56. doi:10.1097/DMP.0b013e31818e8934
11. Harbison R, Crane J, McCluskey J, Johnson G. Assessment of community healthcare providers ability and willingness to respond to emergencies resulting from bioterrorist attacks. J Emerg Trauma Shock. 2010;3(1):13. doi:10.4103/0974–2700.55808
12. Lyon RF. The COVID-19 Response Has Uncovered and Increased Our Vulnerability to Biological Warfare. Mil Med. 2021;186(7–8):193–196. doi:10.1093/milmed/usab061

Evaluating pandemic fatigue within the emergency department

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Atlantic Health System, Morristown, United States

Background: As the COVID-19 pandemic spread throughout the world, healthcare workers were faced with an increased risk of occupationally acquired...
TABLE 1. Threshold Levels used for objective measurement of burnout, depression, and anxiety

| Scoring system | Level       | Score  |
|----------------|-------------|--------|
| CBI            | Low         | 0–49   |
|                | Moderate    | 50–74  |
|                | High        | 75–99  |
| PHQ-9          | Normal      | 0–4    |
|                | Mild        | 5–9    |
|                | Moderate    | 10–14  |
|                | Moderate-Severe | 15–19 |
|                | Severe      | 20–27  |
| GAD-7          | Normal      | 0–4    |
|                | Mild        | 5–9    |
|                | Moderate    | 10–14  |
|                | Severe      | 15–21  |
| IES-R          | Normal      | 0–8    |
|                | Mild        | 9–25   |
|                | Moderate    | 26–43  |
|                | Severe      | 44–88  |

As adopted in Ferry et al., 2021

TABLE 2. Demographics

| Variable          | Characteristics | Frequency | Percent |
|-------------------|-----------------|-----------|---------|
| Age               | 18–24           | 4         | 3.6     |
|                   | 25–43           | 52        | 47.3    |
|                   | 35–44           | 22        | 20      |
|                   | 45–54           | 17        | 15.5    |
|                   | 55–64           | 11        | 10      |
| Gender            | Male            | 29        | 26.4    |
|                   | Female          | 81        | 73.6    |
|                   | Non-binary /    | 0         | 0       |
|                   | third gender    |           |         |
| Race              | White           | 91        | 83.5    |
|                   | Black or        | 2         | 1.8     |
|                   | African American|         |         |
|                   | Asian           | 8         | 7.3     |
|                   | Other           | 8         | 7.3     |
| Education         |                | 2         | 1.8     |

(Continues)
infections, higher patient volumes, pervasive media coverage, concerns about personal and familial safety, concerns about access to appropriate personal protective equipment, and increased patient morbidity. As the pandemic nears 2 years in existence, few studies have evaluated compliance with safety precautions in the face of healthcare worker fatigue and burnout.

Objectives: This study investigated the impact of the COVID-19 on the mental health and burnout levels of ED staff in two urban medical centers, Morristown Medical Center (Morristown, New Jersey, USA) and George Washington University Medical Center (Washington, DC, USA). Additionally, the survey evaluated the impact of burnout levels on compliance with universal precautions to protect healthcare workers.

Method: ED staff who were employed full-time, part-time, or per-diem, including clinical staff such as physicians, nurses, and health aides along with administrative staff were eligible to complete the survey. The survey was administered online via Qualtrics which was emailed to providers. Participants were recruited through email distribution lists for both hospitals to ensure targeted inclusion.

Results: 91.3% reported feeling more stress at work during COVID than before COVID emerged in March 2020. A majority of respondents either had high mental health conditions or high-risk family members. The survey evaluated the impact of burnout levels on compliance with universal precautions to protect healthcare workers.

TABLE 2 (Continued)

| Variable                        | Characteristics          | Frequency | Percent |
|---------------------------------|--------------------------|-----------|---------|
| Emergency Department            | Midshift                 | 34        | 31.5    |
|                                 | George Washington        | 15        | 13.8    |
|                                 | University               |           |         |
|                                 | Morristown Medical Center| 94        | 86.2    |
| Significant past medical history| Yes                      | 10        | 9.2     |
|                                 | No                       | 99        | 90.8    |
| History of Anxiety              | Yes                      | 27        | 24.8    |
|                                 | No                       | 82        | 75.2    |
| History of Depression           | Yes                      | 18        | 16.5    |
|                                 | No                       | 91        | 83.5    |
| Other mental health conditions  | Yes                      | 7         | 6.4     |
|                                 | No                       | 102       | 93.6    |
| High risk family member         | Yes                      | 69        | 63.9    |
|                                 | No                       | 39        | 36.1    |
| Main caregiver for another person| Yes                     | 40        | 36.7    |
|                                 | No                       | 69        | 63.3    |

TABLE 3. Frequencies of Test Categories

| Fear Level of COVID-19            | March 2020 to May 2020 | May 2020 to February 2021 | March 2021 to August 2021 |
|-----------------------------------|------------------------|----------------------------|---------------------------|
| Low                               | 11 (11.8%)             | 19 (20.4%)                 | 48 (51.6%)                |
| Medium                            | 26 (28%)               | 51 (54.8%)                 | 41 (44.1%)                |
| High                              | 56 (60.2%)             | 23 (24.7%)                 | 4 (4.3%)                  |

| CBI Level                        | Frequency | Percent |
|----------------------------------|-----------|---------|
| High                             | 24        | 26.1    |
| Low                              | 28        | 30.4    |
| Moderate                         | 40        | 43.5    |

| GAD7 Levels                      | Frequency | Percent |
|----------------------------------|-----------|---------|
| Mild                             | 30        | 33.3    |
| Moderate                         | 17        | 18.9    |
| Normal                           | 36        | 40      |
| Severe                           | 7         | 7.8     |

| PHQ9 Levels                      | Frequency | Percent |
|----------------------------------|-----------|---------|
| Mild                             | 28        | 30.8    |
| Moderate                         | 14        | 15.4    |
| Moderate-Severe                  | 7         | 7.7     |
| Normal                           | 39        | 42.9    |
| Severe                           | 3         | 3.3     |

| IESR Levels                      | Frequency | Percent |
|----------------------------------|-----------|---------|
| Mild                             | 28        | 31.8    |
| Moderate                         | 21        | 23.9    |
| Normal                           | 29        | 33      |
| Severe                           | 10        | 11.4    |

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## TABLE 4. Frequencies of Test Scores

| Descriptive Statistics | N | Range | Minimum | Maximum | Mean | Std. Deviation | Std. Error | Statistic |
|------------------------|---|-------|---------|---------|------|----------------|------------|-----------|
| Patient Health Questionnaire-9 | 91 | 27.00 | 0.00 | 27.00 | 6.879 | 0.583 | 5.559 |
| General Anxiety Disorder-7 | 90 | 21.00 | 0.00 | 21.00 | 6.689 | 0.529 | 5.023 |
| Impact of Event | 88 | 88.00 | 0.00 | 88.00 | 20.670 | 1.983 | 18.598 |
| Copenhagen Burnout Inventory | 92 | 86.84 | 13.16 | 100.00 | 60.755 | 2.091 | 20.055 |
| Valid N (listwise) | 88 |-------|---------|---------|------|----------------|------------|-----------|

## TABLE 5. Descriptives of Moderate or Above Test Levels

| Moderate-Severe Anxiety | Moderate or Severe Depression |
|-------------------------|-----------------------------|
| No | Yes | N (%) | N (%) | Yes | N (%) | No | N (%) |
| Age | 18–34 | 31 | 47.00% | 15 | 62.50% | 31 | 46.30% | 16 | 66.70% |
| | 35–44 | 13 | 19.70% | 6 | 25.00% | 14 | 20.90% | 5 | 20.80% |
| | 45–54 | 10 | 15.20% | 1 | 4.20% | 10 | 14.90% | 1 | 4.20% |
| | 55 or older | 12 | 18.20% | 2 | 8.30% | 12 | 17.90% | 2 | 8.30% |
| Medical History | No | 63 | 95.50% | 20 | 83.30% | 62 | 92.50% | 22 | 91.70% |
| | Yes | 3 | 4.50% | 4 | 16.70% | 5 | 7.50% | 2 | 8.30% |
| Gender Identity | Non-Male | 49 | 74.20% | 20 | 83.30% | 50 | 74.60% | 20 | 83.30% |
| | Male | 17 | 25.80% | 4 | 16.70% | 17 | 25.40% | 4 | 16.70% |
| Do you have any past medical history of anxiety? | No | 53 | 80.30% | 12 | 50.00% | 53 | 79.10% | 13 | 54.20% |
| | Yes | 13 | 19.70% | 12 | 50.00% | 14 | 20.90% | 11 | 45.80% |
| Do you have any past medical history of depression? | No | 59 | 89.40% | 15 | 62.50% | 60 | 89.60% | 15 | 62.50% |
| | Yes | 7 | 10.60% | 9 | 37.50% | 7 | 10.40% | 9 | 37.50% |
| Do you have any other previous significant mental health condition? | No | 64 | 97.00% | 21 | 87.50% | 64 | 95.50% | 22 | 91.70% |
| | Yes | 2 | 3.00% | 3 | 12.50% | 3 | 4.50% | 2 | 8.30% |
| Did you have a family member (someone you live with or immediate family) in a high-risk category of COVID (over age 65, immunocompromised, overweight, asthma, pregnant)? | No | 23 | 35.40% | 5 | 20.80% | 23 | 34.80% | 5 | 20.80% |
| | Yes | 42 | 64.60% | 19 | 79.20% | 43 | 65.20% | 19 | 79.20% |
| Are you the main caregiver for another person (either within the high-risk category above or dependents)? | No | 43 | 65.20% | 15 | 62.50% | 41 | 61.20% | 17 | 70.80% |
| | Yes | 23 | 34.80% | 9 | 37.50% | 26 | 38.80% | 7 | 29.20% |
| Please address the following questions about emotional/mental health | No | 39 | 60.90% | 23 | 95.80% | 42 | 64.60% | 21 | 87.50% |

(Continues)
### TABLE 5 (Continued)

|                               | Moderate-Severe Anxiety | Moderate or Severe Depression |
|-------------------------------|-------------------------|-----------------------------|
|                               | No N (%) | Yes N (%) | No N (%) | Yes N (%) |
| support - Support is available in the workplace | Yes | 25 39.10% | 1 4.20% | 23 35.40% | 3 12.50% |
| I would rate the support of my team as | Least supportive | 0 0.00% | 0 0.00% | 0 0.00% | 0 0.00% |
|                               | Least or Minimally Supportive | 6 9.10% | 4 17.40% | 7 10.40% | 3 13.00% |
|                               | Sort of Supportive | 21 31.80% | 14 60.90% | 21 31.30% | 15 65.20% |
|                               | Well or Most Supportive | 39 59.10% | 5 21.70% | 39 58.20% | 5 21.70% |
|                               | Most Supportive | 0 0.00% | 0 0.00% | 0 0.00% | 0 0.00% |
| Please address the follow PPE questions from March 2020 to May 2020 - Did you find PPE tolerable? | No | 15 22.70% | 10 41.70% | 15 22.40% | 10 41.70% |
|                               | Yes | 51 77.30% | 14 60.90% | 52 77.60% | 14 58.30% |
| Please address the follow PPE questions from March 2020 to May 2020 - Was adequate PPE always available? | No | 41 62.10% | 15 62.50% | 43 64.20% | 13 54.20% |
|                               | Yes | 25 37.90% | 9 37.50% | 24 35.80% | 11 45.80% |
| Please address the follow PPE questions from May 2020 to February 2021 - Did you find PPE tolerable? | No | 13 19.70% | 13 54.20% | 14 20.90% | 12 50.00% |
|                               | Yes | 53 80.30% | 11 45.80% | 53 79.10% | 12 50.00% |
| Please address the follow PPE questions from May 2020 to February 2021 - Was adequate PPE always available? | No | 20 30.30% | 11 45.80% | 20 29.90% | 11 45.80% |
|                               | Yes | 46 69.70% | 13 54.20% | 47 70.10% | 13 54.20% |
| Please address the follow PPE questions from March 2021 to August 2021 - Did you find PPE tolerable? | No | 17 25.80% | 15 62.50% | 19 28.40% | 13 54.20% |
|                               | Yes | 49 74.20% | 9 37.50% | 48 71.60% | 11 45.80% |
| Please address the follow PPE questions from March 2021 to August 2021 - Was adequate PPE always available? | No | 9 13.60% | 9 37.50% | 11 16.40% | 7 29.20% |
|                               | Yes | 57 86.40% | 15 62.50% | 56 83.60% | 17 70.80% |
| Properly trained with PPE | No | 18 31.60% | 4 12.90% | 18 26.50% | 7 29.20% |
|                               | Yes | 39 68.40% | 27 87.10% | 50 73.50% | 17 70.80% |
| Feel safe or very safe when using PPE | No | 25 43.90% | 14 45.20% | 31 45.60% | 10 41.70% |
|                               | Yes | 32 56.10% | 17 54.80% | 37 54.40% | 14 58.30% |

| Moderate or Severe Distress | Absent | Present |
|----------------------------|--------|---------|
| N  % | N  % | N  % | N  % |
| What is your current age? | 18–34 | 26 45.60% | 19 61.30% | 33 48.50% | 14 58.30% |
|                               | 35–44 | 12 21.10% | 6 19.40% | 12 17.60% | 7 29.20% |
|                               | 45–54 | 9 15.80% | 2 6.50% | 9 13.20% | 3 12.50% |
|                               | 55 or older | 10 17.50% | 4 12.90% | 14 20.60% | 0 0.00% |
| Do you have any significant past medical history (including known ischemic heart disease or coronary | No | 54 94.70% | 28 90.30% | 64 94.10% | 21 87.50% |
|                               | Yes | 3 5.30% | 3 9.70% | 4 5.90% | 3 12.50% |

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**TABLE 5 (Continued)**

|                                | Moderate-Severe Anxiety | Moderate or Severe Depression |
|--------------------------------|-------------------------|-----------------------------|
|                                | No (N) (%)              | Yes (N) (%)                 | Yes (N) (%)              | No (N) (%)              |
| artery disease, diabetes mellitus or immunocompromise? |                         |                             |                           |                           |
| What is your gender? Male      | Non-Male 41 (71.90%) 28 (90.30%) | Male 16 (28.10%) 3 (9.70%) | 52 (76.50%) 19 (79.20%)  | 16 (23.50%) 5 (20.80%)  |
| Do you have any past medical history of anxiety? | No 43 (75.40%) 20 (64.50%) | Yes 14 (24.60%) 11 (35.50%) | 54 (79.40%) 13 (54.20%)  | 14 (20.60%) 11 (45.80%)  |
| Do you have any past medical history of depression? | No 51 (89.50%) 21 (67.70%) | Yes 6 (10.50%) 10 (32.30%) | 60 (88.20%) 16 (66.70%)  | 8 (11.80%) 8 (33.30%)   |
| Do you have any other previous significant mental health condition? | No 55 (96.50%) 28 (90.30%) | Yes 2 (3.50%) 3 (9.70%) | 65 (95.60%) 22 (77.40%)  | 3 (4.40%) 2 (8.30%)  |
| Did you have a family member (someone you live with or immediate family) in a high-risk category of COVID (over age 65, immunocompromised, overweight, asthma, pregnant)? | No 21 (37.50%) 7 (22.60%) | Yes 35 (62.50%) 24 (77.40%) | 47 (70.10%) 17 (73.90%)  | 23 (34.30%) 6 (25.00%)  |
| Are you the main caregiver for another person (either within the high-risk category above or dependents)? | No 37 (64.90%) 20 (64.50%) | Yes 20 (35.10%) 11 (35.50%) | 47 (69.10%) 12 (50.00%)  | 21 (30.90%) 6 (26.10%)  |
| Please address the following questions about emotional/mental health support - Support is available in the workplace | No 34 (61.80%) 26 (83.90%) | Yes 21 (38.20%) 5 (16.10%) | 47 (70.10%) 17 (73.90%)  | 20 (29.90%) 6 (26.10%)  |
| I would rate the support of my team as | Least supportive 0 (0.00%) 0 (0.00%) | Least or Minimally Supportive 5 (8.80%) 4 (13.30%) | 6 (8.80%) 4 (17.40%) |                           |
|                                | Sort of Supportive 20 (35.10%) 15 (50.00%) | Well or Most Supportive 32 (56.10%) 11 (36.70%) | 38 (55.90%) 7 (30.40%) |                           |
|                                | Most Supportive 0 (0.00%) 0 (0.00%) |                           |                           |                           |
| March to May 2020: PPE tolerable | No 13 (22.80%) 10 (32.30%) | Yes 44 (77.20%) 21 (67.70%) | 52 (76.50%) 14 (58.30%)  |                           |
| March to May 2020: PPE adequate | No 38 (66.70%) 18 (58.10%) | Yes 19 (33.30%) 13 (41.90%) | 42 (61.80%) 15 (62.50%)  |                           |
| Please address the follow PPE questions from May 2020 to February 2021 - Did you find PPE tolerable? | No 10 (17.50%) 15 (48.40%) | Yes 47 (82.50%) 16 (51.60%) | 53 (77.90%) 12 (50.00%)  |                           |
| Please address the follow PPE questions from May 2020 to February 2021 - Was adequate PPE always available? | No 17 (29.80%) 14 (45.20%) | Yes 40 (70.20%) 17 (54.80%) | 48 (70.60%) 13 (54.20%)  |                           |
|                                | No 14 (24.60%) 17 (54.80%) |                           |                           |                           |
Burnout level is significantly associated with PPE usage level.

**Conclusion:** This study can inform future policy to better allocate staff and resources to ensure better healthcare worker safety, both physically from an infectious agent and mentally from the stressors of lifesaving work during a pandemic.

**References:**

1. Lai J, Ma S, Wang Y, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Netw Open*. 2020;3(3):e203976. doi:10.1001/jamanetworkopen.2020.3976

2. Smith MW, Smith PW, Kratochvil CJ, Schwedhelm S. The Psychosocial Challenges of Caring for Patients with Ebola Virus Disease. *Health Secur*. 2017;15(1):104–109. doi:10.1089/hs.2016.0068

3. Nickell LA. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. *Can Med Assoc J*. 2004;170(5):793–798. doi:10.1503/cmaj.1031077

4. Matsuishi K, Kawazoe A, Imai H, et al. Psychological impact of the pandemic (H1N1) 2009 on general hospital workers in Kobe. *Psychiatry Clin Neurosci*. 2012;66(4):353–360. doi:10.1111/j.1440-1819.2012.02336.x

5. Tian C, Lovrics O, Vaisman A, et al. Risk factors and protective measures for healthcare worker infection during highly infectious viral respiratory epidemics: a systematic review and meta-analysis. *Infect Control Hosp Epidemiol*. January 2021:1–102. doi:10.1017/ice.2021.18

6. Venkatesh AK, Pallin DJ, Kayden S, Schuur JD. Predictors of Hand Hygiene in the Emergency Department. *Infect Control Hosp Epidemiol*. 2011;32 (11):1120–1123. doi:10.1086/662374

7. Healy S, Tyrrell M. Stress in emergency departments: experiences of nurses and doctors. *Emerg Nurse*. 2011;19(4):31–37. doi:10.7748/en2011.07.19.4.31.e8611

8. Hooper C, Craig J, Janvrin DR, Wetzel MA, Reimels E. Compassion Satisfaction, Burnout, and Compassion Fatigue Among Emergency Nurses Compared With Nurses in Other Selected Inpatient Specialties. *J Emerg Nurs*. 2010;36(3):420–427. doi:10.1016/j.jen.2009.11.027

9. Von Rueden KT, Hinderer KA, McQuillan KA, et al. Secondary Traumatic Stress in Trauma Nurses. *J Trauma Nurs*. 2010;17(4):191–200. doi:10.1097/JTN.0b013e3181ff2607

10. Melamed S, Shirom A, Toker S, Berliner S, Shapira I. Burnout and risk of cardiovascular disease: Evidence, possible causal paths, and promising research directions. *Psychol Bull*. 2006;132(3):327–353. doi:10.1037/0033-2909.132.3.327

11. Shah K, Chaudhari G, Kamrai D, Lail A, Patel RS. How Essential Is to Focus on Physician’s Health and Burnout in Coronavirus (COVID-19) Pandemic? *Cureus*. April 2020. doi:10.7759/cureus.7538

12. Koutsimani P, Montgomery A, Georganta K. The Relationship Between Burnout, Depression, and Anxiety: A Systematic Review and Meta-Analysis. *Front Psychol*. 2019;10. doi:10.3389/fpsyg.2019.00284

13. Woo T, Ho R, Tang A, Tam W. Global prevalence of burnout symptoms among nurses: A systematic review and meta-analysis. *J Psychiatr Res*. 2020;123(3):327–353. doi:10.1016/j.jpsychires.2019.12.015

14. Kumar S. Burnout and Doctors: Prevalence, Prevention and Intervention. *Healthcare*. 2016;4(3):37. doi:10.3390/healthcare4030037

15. Waqas A, Ahmad W, Haddad M, et al. Measuring the well-being of health care professionals in the Punjab: a psychometric evaluation of the Warwick–Edinburgh Mental Well-being Scale in a Pakistani population. *PeerJ*. 2015;3:e1264. doi:10.7717/peerj.1264

**Table format if included:**

| Please address the follow PPE questions from March 2021 to August 2021 - | Moderate-Severe Anxiety | Moderate or Severe Depression |
|---------------------------------------------------------------|--------------------------|---------------------------------|
| Did you find PPE tolerable? | Yes | 43 (75.40%) 14 (45.20%) | 46 (67.60%) 13 (54.20%) |
| March to August 2021: PPE adequate | No | 8 (14.00%) 10 (32.30%) | 12 (17.60%) 6 (25.00%) |
| Properly trained with PPE | Yes | 49 (86.00%) 21 (67.70%) | 56 (82.40%) 18 (75.00%) |
| Feel safe or very safe when using PPE | No | 18 (31.60%) 4 (12.90%) | 18 (25.00%) 7 (29.20%) |
| Properly trained with PPE | Yes | 39 (68.40%) 27 (87.10%) | 50 (73.50%) 17 (70.80%) |
| Feel safe or very safe when using PPE | Yes | 25 (43.90%) 14 (45.20%) | 31 (45.60%) 10 (41.70%) |
| Properly trained with PPE | Yes | 32 (56.10%) 17 (54.80%) | 37 (54.40%) 14 (58.30%) |
Attitudes and regard for specific medical conditions amongst Australian emergency medicine clinicians

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Background: Preconceived attitudes and regard held by staff towards various conditions impacts both the clinician and their patients. Low regard for specific conditions may lead to depersonalized care, low provider satisfaction, and worse overall clinical outcomes. Few studies however have attempted to objectively measure Emergency Medicine (EM) clinicians’ attitudes and regard towards specific conditions.

Objective: To quantify the attitude EM clinicians hold towards patients presenting with different medical conditions; including a novel pandemic condition.

Method: A cross sectional study of emergency doctors and nurses utilizing the Medical Condition Regard Scale (MCRS); a validated tool used to capture the bias and emotions of clinicians towards individual medical conditions. The five conditions presented to participants each represent a classic medical, complex medical, psychiatric/substance use, somatoform and a novel medical condition.

Results: 196 clinicians were included in the study including 116 nurses and 80 doctors. Concerning each condition, both medical and nursing staff demonstrated the highest regard for a classical medical condition (58 ± 5 and 57 ± 6, respectively). Significantly different from the classical medical condition, the lowest MCRS scores were for the somatoform condition (36 ± 10) for emergency doctors and the substance use condition (39 ± 11) for emergency nurses. REGARD for a novel condition (i.e., COVID-19 infection) was comparably high amongst both cohorts (Figure 1).

Conclusion: Emergency doctors and nurses generally hold lower regard for complex medical conditions with behavioral components including substance use disorders and somatoform conditions.

Figure 1: Boxplot chart of Mean MCRS scores for each medical condition grouped by the profession.
**Problems in high performance CPR performed by emergency medical technicians: A case of the 5th corps of the new Taipei city government fire department**

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**Background:** Previous studies have demonstrated significant associations between cardiopulmonary resuscitation (CPR) quality metrics and survival to hospital discharge. Therefore, performing onsite high-performance CPR (HPCPR) during emergencies is a crucial topic in today’s emergency medical education.

**Objectives:** This study investigated HPCPR (which included accuracy in compression recoil rate, compression speed rate, and compression depth as well as overall first aid performance) performed by emergency medical technician (EMT), where the results are to serve as references to relevant units to revise HPCPR education policies in the future.

**Method:** This study selected 123 EMTs as its research participants. A randomized controlled trial that involved those with EMT2 may be encouraged to perform onsite high-performance CPR (HPCPR) during emergencies is a crucial topic in today’s emergency medical education.

**Result:** A total of 52 patients (2.8%) experienced ROSC at the prehospital. An analysis performed using the logistic regression model showed that the ambulance response time had a negative effect on whether the patients experienced ROSC at the prehospital (OR = 0.998; 95% CI 0.996–1.000); and prehospital Epinephrine (OR = 4.659; 95% CI 2.317–9.370) facilitated ROSC in the patients at the prehospital. Patients who received endotracheal intubation (ETI) outperformed those who received a supraglottic airway (SGA) in experiencing ROSC at the prehospital (OR = 4.241; 95% CI 1.917–9.385). Concerning CPR performed using mechanical or manually, no significant differences were observed in patients experiencing ROSC at the prehospital between the two groups.

**Conclusion:** To increase the odds of patients with traumatic OHCA in experiencing ROSC at the prehospital, the ambulance response time should be reduced, and the ratios of prehospital ETI and prehospital Epinephrine should be increased.

**The great barrier rip: Bedside pericardiocentesis as a barrier procedure for hemodynamically unstable aortic dissection at the emergency department**

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The Great Barrier Rip: Bedside Pericardiocentesis as a Barrier Procedure for Hemodynamically Unstable Aortic Dissection at the Emergency Department

**Introduction:** Aortic dissection is a life-threatening disorder which requires early diagnosis and treatment. If left unaddressed, it may lead to serious complications and even death. [1,2] In the presence of cardiac tamponade, surgery is the recommended management for aortic dissections. For hemodynamically unstable patients, bedside pericardiocentesis may be performed as a temporizing or...
“barrier” procedure. However, this procedure remains debatable. [3]

Description: We report a 63-year-old hypertensive male who presented to the emergency room (ER) due to syncope. Vital signs and physical examination revealed BP 80/60, PR 135, RR 26, temperature 36°C, with neck vein distension and distant heart sounds. Neurologic Exam was unremarkable. Point-of-Care Ultrasound (POCUS) revealed findings of severe cardiac tamponade. Confirmatory CT subsequently showed a Type 3 aortic dissection extending from the distal aortic arch to the abdominal aorta. Intramural hematomas were noted in the distal ascending aorta and thoracic aorta. Patient then underwent bedside pericardiocentesis at the emergency room.

Outcomes: After an uneventful pericardiocentesis, patient underwent surgical management and was eventually discharged improved with his lifestyle comparable to pre-morbid state.

Conclusions: Aortic dissection is an emergency that requires surgical intervention ideally either in the cath lab setting or operating room. Amidst controversy and varying results from several studies, recent guidelines state that bedside pericardiocentesis may be considered for patients who are hemodynamically unstable. As our case report demonstrates, pericadiocentesis at the ER can be performed safely as a temporizing or “barrier” procedure for aortic dissection-related tamponade, providing stabilization and additional time before proceeding with definitive surgical management.

References:
1. Mando R, Tim D, DeCicco A, Trivax J, Hanson I: Master of the Masquerade: An Atypical Presentation of Acute Aortic Dissection. Case reports in cardiology, 2020, 5743985.
2. Imamura H, Sekiguchi Y, Iwashita T, Dohgomori H, Mochizuki K, Aizawa K, et al.: Painless acute aortic dissection. - Diagnostic, prognostic and clinical implications.-. Circulation journal: official journal of the Japanese Circulation Society 2011, 75(1), 59–66.
3. Cruz I, Stuart B, Caldeira D, Morgado G, Gomes AC, Almeida AR, Loureiro, MJ, et al.: Controlled pericardiocentesis inpatients with cardiac tamponade complicating aortic dissection: experience of a center without cardiothoracic surgery. European heart journal. Acute cardiovascular care 2017, 4(2), 124–128.

Table 1. Mean stress values for each process and their comparison.

| No. | Action                              | Stress value Mean (SD) | 95% CI     | P-value vs. 2 | P-value vs. 3 | P-value vs. 4 | P-value vs. 5 | P-value vs. 6 |
|-----|-------------------------------------|------------------------|------------|---------------|---------------|---------------|---------------|---------------|
| 1   | Lecture                             | 48.3 (11.3)            | 44.7-52.0  | 0.9496        | 0.6853        | 0.9982        | 0.0548        | 0.6333        |
| 2   | Dressing in protective gear         | 45.1 (9.4)             | 42.0-48.2  |               | 0.1856        | 0.7849        |               |               |
| 3   | Patient acceptance                  | 53.7 (23.9)            | 45.7-61.6  |               |               | 0.9049        | 0.7530        | 0.187         |
| 4   | General medical treatment           | 49.9 (10.9)            | 46.3-53.4  |               |               |               | 0.1591        | 0.3721        |
| 5   | Decontamination                     | 58.6 (18.5)            | 52.5-64.8  |               |               |               |               | 0.0003        |
| 6   | Undressing from protective gear     | 42.7 (16.3)            | 37.2-48.2  |               |               |               |               |               |

CI, confidence interval; SD, standard deviation. P-values in bold italics are statistically significant.
References:
1. Smith EC, Burkle FM, Jr., Archer FL. Fear, familiarity, and the perception of risk: a quantitative analysis of disaster-specific concerns of paramedics. Disaster medicine and public health preparedness. 2011;5(1):46–53.
2. Iyama K, Takano Y, Takahashi T, Hasegawa A. Factors associated with the intention to participate in activities during a nuclear disaster situation among firefighters. J Radiat Res. 2020;61(6):871–875.
3. Iyama K, Kakamu T, Yamashita K, Shimada J, Tasaki O, Hasegawa A. Survey about Intention to Engage in Specific Disaster Activities among Disaster Medical Assistance Team Members. Prehospital and disaster medicine. 2021; 36(6): 684–690.
4. Heart rate variability: standards of measurement, physiological interpretation and clinical use. Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology. Circulation. 1996;93(5):1043–1065.
5. Johansson E, Johansson T, editors. Heart rate variability estimation and data visualization for use in stress level determination in neuro-intensive care patients 2009.

Improving outcomes in emergency care

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Introduction: Emergency departments (EDs) and small rural emergency care services, referred to as Urgent care centers (UCC) are high risk settings where adverse patient safety events leading to significant harm occur. In a unique collaboration of the Victorian Managed Insurance Authority, the Australasian College for Emergency Medicine and Safer Care Victoria, we identified and validated underlying factors leading to these incidents and recommended practical interventions that could reduce preventable patient harm and improve outcomes in ED and UCC.

Description: A thematic analysis of contributory factors and root causes behind 10 years of medical indemnity closed claims and three years of sentinel events related to ED and UCC patients was performed. These themes were validated through focus groups with clinicians, consumers, and health administrators working in different ED and UCC settings. Interventions to address critical factors leading to harm were developed based on published evidence and with input from the project steering committee.

Outcomes: A small number of common presenting complaints represented most of the harm events. Eleven recommendations across the domains of support for clinical decision-making at the bedside, information access, escalation of care and education/information-sharing were developed to address these factors.

Conclusions: Practical, system level interventions that could make a difference to the quality and safety of care in ED and UCC have been identified, and a road map for a staged roll out of these interventions has been developed.

Screening patients in the emergency department for unintentional carbon monoxide exposure: A prospective multicenter study

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Background: Carbon monoxide (CO) is the most common cause of death by poisoning worldwide but is difficult to diagnose due to non-specific symptoms.

Objectives: To establish the prevalence of low-level CO poisoning in patients presenting to the emergency department (ED) with symptoms suggestive of CO exposure.

Method: A prospective multi-center study recruiting from UK EDs between December 2018 and March 2020. Eligible patients had symptoms suggestive of CO poisoning (headache, flu-like symptoms, cardiac chest pain, dizziness, and seizures). We collected data on symptom patterns and carboxyhaemoglobin (COHb) levels. An investigation of the home or workplace was undertaken to identify sources of CO exposure.

Results: We analyzed data from 4190 patients. 159 (3.8%) had suspected CO poisoning based on COHb level and/or symptom pattern. Prevalence was highest in patients with flu-like symptoms 14.8% (7.9, 24.4). Data linked to CO testing in the home confirmed 1 case of CO presence and 21 probable cases based on a possible CO source from gas appliances. 62% of probable cases had normal COHb level in ED. Only 7.5% of patients with raised COHb level were considered by ED.
clinicians to have been exposed to CO as a cause for their symptoms.

Conclusion: Despite public health messaging alerting clinicians to the need to be cognisant of CO poisoning in patients with non-specific symptoms the results show a small but potentially clinically significant number of undiagnosed cases of CO poisoning in patients presenting to the ED with symptoms suggestive of low-level CO exposure.

Scombroid poisoning: A common but frequently misdiagnosed condition

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Introduction: Scombroid poisoning, also known as histamine fish toxicity, occurs after ingestion of histamine contaminated fish from the suborder Scombroidea.¹ It is the most common cause of ichthyotoxicity worldwide.²

Description: A 25-year-old lady, with no known allergies presented to the Emergency Department for the second time within a day with unresolved rashes, dizziness, and abdominal pain. She had come the day before with similar symptoms after ingesting grilled fish (mackerel), and was discharged as allergic reaction to seafood, with a course of corticosteroids.

Outcome: At the second visit, she was flushed, tachycardic, and had a generalized urticarial rash. She revealed she never had hypersensitivity reaction before. A diagnosis of Scombroid poisoning was made and was treated with IV fluids and antihistamines. She was discharged well the next day.

Conclusion: Scombroid poisoning is a histamine toxicity syndrome. Histamine is produced by the decarboxylation process due to enzymes in gram-negative bacteria found in the fish.³

Symptoms are typically mild (erythema, palpitations, and diarrhea) but may lead to severe symptoms such as bronchospasm, vasodilatory shock, and even myocardial infarction.³ A clinical diagnosis is usually made but it can be confirmed by measurement of histamine levels in plasma, urine or in the spoilt food.⁴

Allergic reactions present similarly, making it difficult to diagnose, however proper history of previous allergies and the type of fish consumed is crucial.⁶ Histamine does not alter the organoleptic quality of food, so there will be no change in the smell or appearance.² Histamine is heat stable, and remains present after cooking, freezing or canning.² In scombroid poisoning, more then one person, may be affected.³

Most cases are usually self limiting, but if treatment is needed, rapid acting anti-histamines along with supportive care is given. Adrenaline is rarely required.⁶ Corticosteroids are not indicated.⁶

To prevent poisoning, proper education regarding storage of raw fish and notification to public health authorities to investigate the source is recommended.⁵

References:
1. Hungerford JM. Scombroid poisoning: a review. Toxicon2010;56:231–43
2. Morrow JD, Margolies GR, Rowland J, et al. Evidence that histamine is the causative toxin of scombroid-fish poisoning. N Engl J Med 1991;324:716–20
3. Attaran RR, Probst F. Histamine fish poisoning: a common but frequently misdiagnosed condition. Emerg Med J 2002;19:474–5
4. Gilbert RJ, Hobbs G, Murray CK, et al. Scombrototoxic fish poisoning: features of the first 50 incidents to be reported in Britain (1976–9) Br Med J. 1980;281:71–72. doi: 10.1136/bmj.281.6237.459-b.
5. Cato JC. Seafood Safety – Economics of Hazard Analysis and Critical Control Point (HACCP) Programs. FAO Fisheries Technical Paper No. 381. Rome: Food and Agriculture Organization of the United Nations; 1998.
6. Iannuzzi M, D’Ignazio N, Bressy L, et al. Severe scombroid fish poisoning syndrome requiring aggressive fluid resuscitation in the emergency department: two cases. Minerva Anestesiol. 2007;73:481–483.

Rash on the torso.

Rash behind the knee in scombroid poisoning, similar to urticarial rash seen in allergies.
Conclusions: SynvIchor of the possibility of infection. Swelling, to complement subjective physician assessment diagnostic tool for patients presenting with joint pain or ing test score (range, 0 vs sterile arthropathy was found to increase with increas-
curve of 0.94 for discriminating joint infection from ster-
Results: The study employed a retrospective, observa-
tional, noninterventional design, and recruited a hetero-
genous cohort of adult patients in various clinical
settings from seven sites across Australia (n = 84). The
performance of SynvIchor™ was compared with retro-
spective physician diagnosis by a panel of three experts.
Results: In receiver operating characteristic curve (ROC)
analysis, SynvIchor™ had an estimated area under the
curve of 0.94 for discriminating joint infection from ster-
ile arthropathy. The relative likelihood of joint infection
vs sterile arthropathy was found to increase with increasing
test score (range, 0–10).
Conclusions: SynvIchor™ appears to be a promising
diagnostic tool for patients presenting with joint pain or
swelling, to complement subjective physician assessment
of the possibility of infection.

Calcium channel blocker overdose
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Introduction: Calcium channel blockers (CCBs) are
among the most commonly used cardiovascular drugs in
the adult population. They are used to treat a broad
array of clinical conditions, including hypertension, sup-
raventricular tachycardia, vasospasm, and migraine
headaches.

Case Description: A 11 years old boy was brought to ED
by his mother with alleged history of consumption of
verapamil tablet (calcium channel blocker), approximately 15 tablets at his farm land 6 h before pre-
senting to ED. He complained of abdominal pain, giddi-
ness, vomiting, nausea. On receiving vitals were BP-
90/50 mmhg, PR-58 bpm, Temperature – normal, Spo2-
96%, CBG-126 mg/dl. No comorbidities. IV access
access secured immediately, Crystalloids started at 20ml/kg.
INJ.CALCIUM GLUCONATE 10%, 10 ML SLOW IV
given over 10 min. INJ. GLUCAGON 3 MG IV given.
Cardiac monitoring connected. 12 Lead ECG done
drew normal sinus bradycardia and all other blood
Investigations were sent and reports normal. GI decon-
tamination done using nasogastric tube. Activated Char-
coal 20 g given through nasogastric tube. Suddenly
symptoms started. BP-not record-
able, PR - < 50 bpm, temperature-normal. Patient
was intubated with ET tube size 6.0 with RSI. INJ.ATRO-
PINE 1MG IV given. INJ.NORADRENALINE 5MCG/
MIN IV infusion was started. Patient was monitored
continuously. Pediatric consultation and admitted
to PICU.
Conclusion: Symptomatic patients should be admitted in
an ICU setting. Even asymptomatic patient should be
admitted in ICU for atleast 24 h with serial ECG moni-
toring. Patients with unintentional overdose may be
discharged at this point, and those whose poisoning is
intentional typically receive psychiatric evaluation.

Data Registry to help inform the emergency department on key performance indicators
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1
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Background: In 2021 a new electronic registry system
was implemented in Vila Central Emergency Department
to help improve patient and staff satisfaction, patient
safety and provide objective measurements of the success
of Vila Emergency Department
Objectives: In 2021 an electronic data registry was
implemented in which patient information including
demographics, presenting complaint, timeline of stay in
the Emergency Department, diagnosis, and interventions
performed. It also provided data on Health surveillance
including communicable, non-communicable diseases
and research conditions
Method: Retrospective analysis of the data registry has
provided key information which we have been able to
use to improve data surveillance, monitor important
public health conditions, improve patient safety, and
implement innovative treatment models and identify gaps
in our health care delivery.
Results: By the end of our retrospective analysis of
the data we aim to identify crucial health trends amongst the
Vanuatu population presenting to the Emergency
Department at Vila Central Hospital

Evaluated native & prosthetic joint infections using novel genomic biomarkers
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2Emergency Department, Cairns Hospital, Cairns, Australia
Objectives: To evaluate the diagnostic performance of a
molecular host response assay (SynvIchor™), designed to
distinguish between joint infection and non-infectious
sterile arthropathies in both native and prosthetic joints.
Methods: The study employed a retrospective, observa-
tional, noninterventional design, and recruited a hetero-
genous cohort of adult patients in various clinical
settings from seven sites across Australia (n = 84). The
performance of SynvIchor™ was compared with retro-
spective physician diagnosis by a panel of three experts.
Results: In receiver operating characteristic curve (ROC)
analysis, SynvIchor™ had an estimated area under the
curve of 0.94 for discriminating joint infection from ster-
ile arthropathy. The relative likelihood of joint infection
vs sterile arthropathy was found to increase with increasing
test score (range, 0–10).
Conclusions: SynvIchor™ appears to be a promising
diagnostic tool for patients presenting with joint pain or
swelling, to complement subjective physician assessment
of the possibility of infection.

ABSTRACT
Conclusion: The electronic data registry is the first of its kind in Vanuatu Emergency Departments which allows us to improve the delivery of health care to patients, identify important trends in public health conditions, evaluate our effectiveness, and enable us to compare our standards to global emergency departments using objective measurements.

POCUS (Point-of-Care Ultrasound) in the Eye of a Catecholamine Storm

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Introduction: Secondary hypertension affects approximately 10% of young hypertensives.1 Identifying the cause of secondary hypertension is crucial as it is potentially reversible with appropriate targeted treatment.2 We report on a case of a young hypertensive patient who was diagnosed with the aid of POCUS in uncovering the true etiology of his secondary hypertension.

Description: A 30-year-old male had a background of chronic headaches for the past six months which was treated with analgesics from a district clinic. He presented acutely to the emergency department (ED) with severe headache, palpitations, diaphoresis, flushing, markedly elevated blood pressure (BP) and tachycardia. Clinical examination did not reveal any neurological deficit. A CT brain was unremarkable. He was treated for hypertensive encephalopathy with parenteral antihypertensives. There was no other evidence of target end organ damage. Standard POCUS unveiled a right adrenal mass with mixed echogenicity. CT abdomen confirmed the finding of a large heterogeneously enhancing mass in the right adrenal.

Outcomes: The patient was admitted for BP control management and further workup. A raised urine and serum metanephrines biochemically correlated with the diagnosis of pheochromocytoma. An elective right adrenalectomy was performed successfully, and the mass was histologically confirmed as pheochromocytoma.

Conclusions: Integrating POCUS in the workup of the young hypertensive presenting with hypertensive emergency in the ED will be valuable in determining the cause of the patient’s secondary hypertension as diagnostic and treatment pathways can be tailored to the underlying pathology. A recommended POCUS algorithm for the young hypertensive would incorporate ocular, cardiac, lung, kidneys, and adrenal ultrasound.

References:
1. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, Ramirez A, Schlaich M, Stergiou GS, Tomaszewski M, Wainford RD, Williams B, Schutte AE. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension. 2020 Jun;75(6):1334–1357. doi: 10.1161/HYPERTENSIONAHA.120.15026. Epub 2020 May 6. PMID: 32370572.
2. Robinson DY. Adrenal Mass Causing Secondary Hypertension. J Emerg Med. 2015 Nov;49(5):638–40. doi: 10.1016/j.jemermed.2015.06.016. Epub 2015 Aug 14. PMID: 26279508.

Should pregnancy be a “red flag” in emergency department headache assessment—implications of new evidence

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Background: Pregnancy has been regarded as a so-called ‘red flag’ feature in headache assessment but the evidence for this is scarce.[1] The HEAD (Headache in Emergency Departments) study and its Colombian partner study (HEAD-Colombia) provided an opportunity to seek this evidence.

Objectives: 1. To describe the prevalence and causes of serious secondary headache in patients who presented to a participating ED and who were pregnant.
2. To compare the rate of serious secondary headache in pregnant patients with a) non-pregnant patients aged ≤50 years and b) non-pregnant female patients aged ≤50 years

Method: Retrospective cohort study of adult patients presenting to 69 healthcare facilities in 11 countries (HEAD

| Serious secondary cause | N       | %, 95% CI       | p value# |
|-------------------------|---------|-----------------|----------|
| Overall                 | 190/3643| 5.2%, 4.5–6%    |          |
| Pregnant patients       | 6/117   | 5.1%, 2.4–10.7% |          |
| Non-pregnant aged ≤50   | 184/3526| 5.2%, 4.5–6%    | 0.97     |
| Non-pregnant female patients aged ≤50 | 108/2306 | 4.7%, 3.9–5.6% | 0.82     |

# compared to pregnant patients
ABSTRACT

International regional variation in initial treatment of migraine headache in emergency departments–A HEAD and HEAD Colombia project

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Objectives: To describe international regional variation in initial treatments prescribed to ED headache patients with an ED discharge diagnosis of migraine.

Methods: Secondary analysis of multi-national data from an observational study of ED headache presentations in 11 countries in Australia and New Zealand, Southeast Asia, Europe and the United Kingdom, and South America focussed on patients with an ED discharge diagnosis of migraine. The primary outcome was whether a drug class was administered in ED after initial assessment (within 30 min of ED assessment) by region.

Results: There were 1302 participants – 81% received medications in ED. Non-opioid analgesics (63%), dopamine antagonists (42%), opioids (16%) and corticosteroids (11%) were the most frequently prescribed initial medications. Triptans (5%) and ergots (0.7%) were infrequently used. There was statistically and clinically significant international regional variation in drug use with dopamine antagonists and corticosteroids being more commonly used in South America and opioids in Australia/New Zealand and Southeast Asia. Corticosteroids to prevent recurrence were rarely used outside South America (0.1% rest of world vs 68%).

Conclusion: There was wide international variation in initial medications prescribed to treat headache patients presenting to ED who had a final diagnosis of migraine. Use of proven abortive treatment (dopamine antagonists or triptans) was sub-optimal. International ED-specific treatment guidelines could reduce variation in practice, reduce opioids use and improve patient outcomes.

Characteristics, investigation, management and outcome of non-traumatic headache–A South American perspective

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Objective: To describe the epidemiology of non-traumatic headache in adults presenting to an emergency department (ED) in Colombia.

Methods: Observational cross-sectional study of adults (≥18 years) with non-traumatic headache as the main presenting complaint. Exclusions were recent head trauma, missing records, inter-hospital transfers, representation with same headache as a recent visit and headache as an associated symptom. Data collected included demographics, clinical assessment, investigation, treatment, and outcome.

Results: We enrolled 757 patients – median age 39, 76% female. Most headaches were of >1 day duration (72%), of gradual onset (85%) and moderate severity (77%). New neurological examination findings were uncommon (4%). Head CT was performed in 49.9% of patients, of which 9% showed clinically important pathology. MRI was performed in 20% of patients. More than 30 different diagnoses were made. Presumed non-migraine benign headache accounted for 42% of cases with another 26% classified as migraine. A small sub-group have a serious cause for their headache (9%) with subarachnoid hemorrhage, stroke, neoplasm, non-SAH intracranial hemorrhage/haematoma and meningitis accounting for about 1% each. Most patients were treated with simple analgesics (paracetamol, aspirin, or non-steroidal anti-inflammatory agents). Use of triptans and phenothiazines was uncommon. Most patients were discharged home (88%).

Conclusion: Diagnosis and management of headache in ED is challenging. A small group of patients have a serious cause for their symptoms.
A pilot study of emergency department doctors’ understanding and approach to patients of intimate partner violence in Singapore

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Background: Intimate partner violence (IPV) is a global health problem as well as a violation of human rights.

Objectives: As doctors in the Emergency Department (ED) are often the first port-of-call for patients who suffer from injuries from IPV, we look at doctors’ training, knowledge and practices through a single-center cross-sectional pilot study.

Method: An anonymized online survey was sent to doctors in the ED enquiring about their training, perceptions and practices with regards to IPV patients.

Results: 26 doctors (36.6%) were confident of their legal obligations to report IPV to the Police. There was no significant association between doctor chronicity and whether they were aware of their legal reporting obligations p= .50. Over 80% of doctors were unaware of what community services were available. There was no significant association between doctor chronicity and whether they were aware of the available community services that an IPV patient may access p= .26. Almost all doctors reported not having received training on consulting with IPV patients. 80.3% of doctors surveyed said they were not satisfied with their patient management. Again, the chronicity of the doctor was not significantly associated with their satisfaction on IPV patient management, p = .95. The reasons included lack of consultation time, unawareness of appropriate interventions and insufficient training on effective communication.

Conclusion: There is a knowledge gap and lack of training of doctors on IPV patient management. From our results, we suggest that it would be beneficial for doctors of all levels to receive structured training on the subject.

References:
1. World Health Organization. Understanding and addressing violence against women. [Internet]. 2012. Available from http://apps.who.int/iris/bitstream/handle/10663/77432/WHO_RHR_12.36_eng.pdf?sequence=1
2. Pierotti RS. Increasing rejection of intimate partner violence: evidence of global cultural diffusion. American Sociological Review 2013;78(2):240–265.
3. World Health Organization. Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence. [Internet]. 2013. Available from https://www.who.int/publications/i/item/9789241564625
4. Bouhours B, Cheong CW, Bong B et al. Singapore IVAWS (final report). [Internet]. 2013. Available from https://www.researchgate.net/publication/257410179_Singapore_IVAWS_final_report
5. Ang A. What you need to know: spousal abuse (I). Singapore Med J 1997;38(7):305–306.
6. Dean AG, Sullivan KM, Soe MM. OpenEpi: Open Source Epidemiologic Statistics for Public Health, Version. http://www.OpenEpi.com, updated 2013/04/06, accessed 2021/05/28. Available from http://www.openepi.com/SampleSize/SSPropor.htm

Factors related to delirium at discharge from the critical care center

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Objectives: The purpose of this study was to extract the factors related to delirium at discharge from the critical care center.

Methods: The subjects were 83 patients who admitted to the emergency department of Hospital "A" and they were all eligible for medical rehabilitation. In addition, the subjects were divided into two groups, a delirium group (DG, N = 12) and a non-delirium group (NDG,
A study to assess the current base knowledge of doctors to correctly identify and treat life threatening ventricular arrhythmias at the Port Moresby General Hospital, PNG

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Background: The early identification and treatment of life threatening ventricular arrhythmias (LTVAs) is crucial to maximizing the chance for favorable patient outcomes. The current ability of Port Moresby General Hospital (PMGH) doctors to identify and treat LTVAs is not known.

Objective: The primary objective of this study was to identify the base knowledge of PMGH doctors in diagnosing and treating LTVAs.

Method: A convenience sample of 124 PMGH doctors, from various departments, were involved in this prospective descriptive questionnaire-based survey, conducted from 19th to 30th August 2019. The questionnaire contained eight multiple choice questions related to general knowledge of cardiac arrest resuscitation, in addition to five case scenarios, each with an accompanying cardiac rhythm strip showing a LTVA. Participants were required to name the arrhythmia, by choosing from a list of eight provided, and also state if the arrhythmia was shockable or non-shockable.

Results: Ninety percent (n = 112) of the 124 participating doctors failed the questionnaire. The doctors who passed were from the departments of Emergency Medicine (n = 11) and Anesthesia/ICU (n = 1). Doctors who frequently participated in CPR scenario simulation training were 9 times more likely to correctly identify and treat the LTVAs presented (OR 9.16, 95% CI 2.91 – 28.77, P value 0.000).

Conclusion: The current base knowledge of the majority of PMGH doctors is significantly deficient with respect to their ability to identify and treat LTVAs. Frequent simulation training in CPR scenarios will improve the doctors’ retention of knowledge and skills in diagnosing and treating LTVAs.

Critical upper airway edema after a bee sting to the uvula

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Hymenoptera stings of the upper airway are rare events, but can result in rapid, life-threatening airway emergencies. The allergic and toxic mediators that are released from the stings of bees and wasps can cause local tissue inflammation and edema with subsequent upper airway obstruction. We report the case of a 15 year old girl who suffered a bee sting to the uvula while zip-lining in Costa Rica. Shortly thereafter, she developed a choking sensation with associated dysphonia, odynophagia, drooling, and respiratory distress. She was brought to a rural emergency medical clinic where she was noted to have an erythematous, edematous, boggy uvula, with a black stinger lodged within it, as well as edema of the anterior pillars of the tonsils and soft palate (Figure 1A). The stinger was removed with tweezers and she was treated with an intravenous corticosteroid and antihistamine. She had persistence of airway edema and symptoms until the administration of epinephrine, which resulted in clinical improvement shortly thereafter.

Figure 1
Hymenoptera stings to the upper airway can be life threatening and require immediate recognition and emergency medical care. Bee stingers have microscopic barbs that detach from the bee and remain embedded in the target tissue, often with an attached venom sac that continues to pump venom into the tissue via a piston-like muscular injection mechanism. This case emphasizes the importance of immediate manual removal of the stinger, and in cases with significant upper airway edema, the administration of epinephrine should be considered.

Clinical and risk variables associated with abnormal levels of serum calcium, magnesium, and phosphate in the emergency department

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Background: Several studies have documented that over-investigation of laboratories did not change the management strategy and could increase ED overcrowding.

| Variables                              | Values                  | Missing data (n, %) |
|----------------------------------------|-------------------------|---------------------|
| Age – mean (SD)                        | 62.1 (18.7)             | 0                   |
| Gender – male, n (%)                   | 288 (48.2)              | 0                   |
| Weekend – n (%)                        | 187 (31.3)              | 0                   |
| Symptoms – n (%)                       | 81 (13.6)               | 0                   |
| Nausea                                 | 70 (11.7)               | 0                   |
| Vomiting                               | 32 (5.4)                | 0                   |
| Weakness                               | 5 (0.8)                 | 0                   |
| Numbness                               | 3 (0.5)                 | 0                   |
| Hand and foot spasm                    | 138 (23.1)              | 0                   |
| Alteration of consciousness           | 64 (10.7)               | 0                   |
| Palpitation                            | 38 (6.4)                | 0                   |
| Seizure                                | 28 (4.7)                | 0                   |
| Diarrhea                               | 103 (17.2)              | 0                   |
| Fatigue                                |                         | 0                   |
| Comorbidities – n (%)                  | 114 (19.1)              | 0                   |
| Chronic kidney disease                 | 87 (14.6)               | 0                   |
| Malignancy                             | 1 (0.2)                 | 0                   |
| Hyperparathyroidism                    | 2 (0.3)                 | 0                   |
| Hypoparathyroidism                     | 158 (26.4)              | 0                   |
| Diabetes                               | 36 (6.0)                | 0                   |
| Chronic liver disease                  | 54 (9.0)                | 0                   |
| Alcohol use                            |                         | 0                   |
| Serum calcium level – mean, SD         | 8.9 (1.0)               | 4 (0.7)             |
| Serum calcium level – n (%)            | 166 (28.0)              | 4 (0.7)             |
| <8.6 mg/dl                             | 404 (68.0)              | 0                   |
| 8.6–10.2 mg/dl                         | 24 (4.0)                | 0                   |
| >10.2 mg/dl                            |                         | 0                   |
| Serum albumin level – mean, SD         | 3.6 (0.8)               | 181 (30.3)          |
| Serum albumin level – n (%)            | 60 (14.4)               | 181 (30.3)          |
| >3.5 g/dl                              | 116 (27.8)              | 0                   |
| 2.8–3.5 g/dl                           | 241 (57.8)              | 0                   |
| <2.8 g/dl                              |                         | 0                   |
| Corrected serum calcium level – mean, SD| 9.2 (1.0)               | 183 (30.6)          |
| Corrected serum calcium level – n (%)  | 9 (2.2)                 | 183 (30.6)          |
| <7.0 mg/dl                             | 46 (11.1)               | 0                   |
| 7.0–8.4 mg/dl                          | 338 (81.5)              | 0                   |

(Continues)
Objectives: This study aims to investigate additional clinical and risk variables associated with abnormal Ca, Mg, and PO4 levels in the ED.

Method: We conducted a prospective study at a university hospital between August and November 2020, collecting adult patients without traumatic complaints who attended the ED and had at least one Ca, Mg, or PO4 levels. The primary endpoint was the association between clinical and risk variables with abnormal serum Ca, Mg, and PO4 levels in ED.
Results: 598 patients with at least Ca, Mg, or PO4 tests, were included in this study (10.3% of total visits, 95% CI 9.6%–11.1%). 18.5%, 15.2%, and 29.5% of patients with abnormal corrected serum Ca, Mg, and PO4 tests, respectively. Treatments were given with 3.1%, 2.0%, and 0.6% for Ca, Mg, and PO4, respectively. The positive LHR for patients with at least one symptom whom treatments were given for abnormal serum corrected Ca, Mg, and PO4 was 1.6 (95% CI 1.5–1.8), 1.2 (95% CI 0.9–1.5), and 1.6 (95% CI 0.9–2.8), respectively.

Conclusion: Only some clinical risk factors were associated with abnormal levels, and treatment was given. We suggest investigating patients with potential clinical risks to avoid unnecessary investigation and ED overcrowding.

Keywords: Calcium, Magnesium, Phosphate, emergency department, risk variable, investigation

References:
1. Vidyarthi AR, Hamill T, Green AL, Rosenbluth G, Baron RB. Changing Resident Test Ordering Behavior: A Multilevel Intervention to Decrease Laboratory Utilization at an Academic Medical Center. Am J Med Qual. 2015;30(1):81–7.
2. Wibulpolprasert A, Sittichanbuncha Y, Sricharoen P, Borwornrisuk S, Sawanyawisuth K. Factors Associated with Overcrowded Emergency Rooms in Thailand: A Medical School Setting. Emerg Med Int [Internet]. 2014 [cited 2020 Jul 1];2014. Available from: /pmc/articles/PMC4195257/?report=abstract
3. Rose WD, Martin JE, Abraham FM, Jackson RL, Williams JM, Gunel E, et al. Calcium, magnesium, and phosphorus: Emergency department testing yield. Acad Emerg Med. 1997;4(2):303–12.
4. Date PA, Spencer WS, de Tonnerre EJ, Yeoh MJ, Taylor DMD. Utility of calcium, magnesium and phosphate testing in the emergency department. EMA - Emerg Med Australas. 2020 Feb 1;32(1):39–44.
5. Taylor DMD, Date PA, Ugoni A, Smith JL, Spencer WS, de Tonnerre EJ, et al. Risk variables associated with abnormal calcium, magnesium and phosphate levels among emergency department patients. EMA - Emerg Med Australas. 2020 Apr 1;32(2):303–12.

Prothrombinex®-VF in chronic liver disease, friend, or foe? A retrospective analysis

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Background: Management of coagulopathy in chronic liver disease (CLD) poses a challenge for critical care physicians. Prothrombinex®-VF is a low volume product with rapid onset of action. Evidence for its efficacy and safety in CLD is limited and cases of acute intravascular coagulation and fibrinolysis (AICF) and/or disseminated intravascular coagulation (DIC) have been reported.

Figure 1 demonstrates individual patient trends in INR, APTT, fibrinogen, and platelet count within 72 h of Prothrombinex®-VF administration. The vertical red lines represent worsening of the coagulation marker, and the vertical blue lines represent improvement of the coagulation marker. The horizontal green dotted lines represent the threshold for reversal of coagulation marker. Patient 1 to 15 had ACLF, patient 16 to 26 had ADC and patient 27 to 30 had CC.
Objective: Our objective was to evaluate the role of Prothrombinex®-VF in reversal of coagulopathy and the incidence AICF/DIC, thromboembolic events and mortality.

Methodology: This was a retrospective, multi-center study of Prothrombinex®-VF use in CLD across 11 hospitals over a 2-year period, excluding those on therapeutic anticoagulation. Patients were subclassified into acute on chronic liver failure (ACLF), acute decompensation (ADC) and compensated cirrhosis (CC). Reversal of coagulopathy was defined as INR <1.5x upper limit normal (ULN), PT <1.5xULN, APTT <1.5xULN and Fibrinogen >1g/L.

Results: Thirty CLD patients were included, and the median MELD score was 23.5. Acute bleeding was the most common indication for Prothrombinex®-VF (60%). All had baseline coagulopathy and the majority did not achieve reversal (Figure 1). Key indicators of AICF/DIC were mainly observed in those with ACLF; bleeding from mucosa or lines (53%), worsening hypofibrinogenaemia (60%), worsening thrombocytopenia (60%) (Table 1). The ADC and CC groups were relatively unaffected. Incidence of venous thromboembolism was 6%. Overall mortality was 43% and 70% in ACLF.

Conclusion: Prothrombinex®-VF did not lead to meaningful reversal of coagulopathy and should be used with caution in CLD. Patients with ACLF were more likely to develop AICF/DIC following Prothrombinex®-VF, although the association is uncertain.

Global emergency medicine provider survey to ascertain subjective likelihood of thromboembolism (GESTALT)

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Background: As Emergency Medicine (EM) emerges as a specialty in many nations, clinical decision scores are being applied worldwide with increasing frequency. Often, a component of these tools requires use of gestalt, or clinical judgment, to consider patients “low-risk” for certain pathologies.

Objectives: To evaluate for variation in global EM physician gestalt.

Method: This was a cross-sectional pilot study using clinical vignettes asking whether a patient is Low-Risk (<15%) for Pulmonary Embolism. These vignettes were created using the Three-Tier Well’s Score model with

Table 1. Markers of AICF/DIC following Prothrombinex®-VF administration

| Evidence of AICF/DIC                        | CLD n = 30 | ACLF N = 15 | ADC N = 11 | CC N = 4 |
|--------------------------------------------|-----------|------------|------------|----------|
| Bleeding from mucosa/intravascular lines   | 9 (30%)   | 8 (53%)    | 0          | 0        |
| Elevated D-dimer                           | 6 (20%)   | 6 (40%)    | 0          | 0        |
| Worsening PT >20 sec                       | 7 (23%)   | 7 (15%)    | 0          | 0        |
| Worsening APTT > 59 sec                    | 10 (33%)  | 10 (15%)   | 0          | 0        |
| Worsening thrombocytopenia <100 x10⁹/L     | 14 (47%)  | 9 (60%)    | 4 (36%)    | 1 (25%)  |
| Worsening Hypofibrinogenaemia <1 g/L       | 10 (33%)  | 9 (60%)    | 1 (9%)     | 0        |
| Fibrinogen discordance > 0.3*              | 10 (33%)  | 9 (60%)    | 1 (9%)     | 0        |

*Fibrinogen discordance = derived fibrinogen (fib d) minus clottable fibrinogen (fib c).

^Worsening of the above coagulation markers represent a >15% change.

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| Worsening thrombocytopenia <100 x10⁹/L     | 14 (47%)  | 9 (60%)    | 4 (36%)    | 1 (25%)  |
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*Fibrinogen discordance = derived fibrinogen (fib d) minus clottable fibrinogen (fib c).

^Worsening of the above coagulation markers represent a >15% change.

Figure 1

| Country   | Total Responses | CDR Used | Percent |
|-----------|-----------------|----------|---------|
| Argentina | 13              | 9        | 69.2    |
| Denmark   | 4               | 1        | 25      |
| Egypt     | 1               | 1        | 100     |
| India     | 14              | 13       | 92.9    |
| Jamaica   | 8               | 5        | 62.5    |
| Kenya     | 1               | 1        | 100     |
| Nicaragua | 2               | 1        | 50      |
| Canada    | 1               | 1        | 100     |
| Grand Cayman | 1       | 1        | 100     |
| Rwanda    | 7               | 2        | 28.6    |
| USA       | 12              | 7        | 58.3    |
| Puerto Rico | 1           | 0        | 0       |
| Total     | 65              | 42       | 64.6    |

Percent in the Total row shows overall percentage (equivalent to weighted mean) across countries, with SD in parentheses.
“Low Risk” being a Well’s Scores of less than 2 and were validated by a group of attending EM physicians practicing in the Detroit area. Demographic information, whether a clinical decision rule was used, and EM residency training status was collected as well.

Results: Our survey had 65 responses from 10 countries spanning 5 continents. There was wide variation in responses both within countries and between countries. Country level percentage-correct had moderate variability and ranged from 62% to 100%. EM residency trained respondents were correct 81% of the time and those with no EM residency training were correct 66% of the time, which was statistically significant (p = 0.0021). Additionally, it was noted that 64.6% (SD = 7.54) of respondents used clinical decision tools when completing the vignettes (Figure 1).

Conclusion: Our study suggests that there is a wide variation in the gestalt of EM physicians practicing around the globe and calls into question the utility of gestalt-based clinical decision tools in countries where they have not been validated.

Rapid molecular viral testing for hospital acquired infections in the Pediatric emergency department

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Background: One in seventy-four patients contract a Hospital Acquired Infection (HAI), greatly increasing patient morbidity, and mortality, adding to the bed block burden on our healthcare system. A timely and sensitive diagnosis is therefore critical to ensure quality care and benefits Emergency Department (ED) operations.

Objective: To investigate potential risk factors associated with respiratory HAI incidence, and Clostridium difficile infections, a prominent causative agent of nosocomial antibiotic-associated diarrhea.

Method: A retrospective cohort study of patients aged ≤21 years who received a respiratory or stool multiplex PCR during one calendar year at a metropolitan Pediatric ED was performed. Patient demographics, Charlson Comorbidity Index (CCI) and hospital length of stay (LOS) were collected. Multivariable logistic regression models were applied to estimate odds ratio (OR) and 95% confidence interval (CI) to assess risk factors.

Results: We included 10,317 patients (median age: 5.6 years, IQR 1–10; 59% male) in our analysis. The median hospital LOS was 55.31 h. Patients possessing a CCI ≥ 3 had higher odds of contracting a respiratory HAI compared to patients with a CCI = 0 (OR: 12.02; 95% CI: 5.01 – 28.82). Additionally, those with a CCI ≥ 3 were more likely to contract C. difficile compared to patients with a CCI = 0 (OR 27.15; 95% CI 6.04–122.02). Other investigated factors were not statistically significant.

Conclusion: Patients presenting with more comorbidities had higher odds to contract a respiratory HAI and C. difficile. These findings warrant improved surveillance and evaluation of targeted interventions to prevent HAIs and improve patient care.

Assessment of substance use among injured persons seeking emergency care in Nairobi Kenya

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Background: Trauma is a leading cause of morbidity and mortality in Kenya.1–3 Substance use has been seen among emergency department (ED) patients and in particular among those with injuries in other settings.4–9

Objectives: This work was intended to describe the epidemiology of reported substance use among adult injured patients seeking ED care in Nairobi, Kenya.

Method: This cross-sectional study (March to June 2021) was among patients with acute injuries at the Kenyatta National Hospital ED. Data on substance use, injury characteristics and ED disposition were prospectively collected. The primary outcome was the reported prevalence of substance use (including alcohol, stimulants, marijuana, and opiates).

Results: Of 1,282 patients screened, 646 were enrolled. Of these, 322 (49.8%) reported substance use in the past month. Among enrolled patients, 312 (48.3%) reported some alcohol use in the past month, and 271 (42.0%) were positive on hazardous alcohol use screening. Among reported substance users, 87 participants (13.5%) reported using ≥2 substances in the prior month. Time from injury to emergency ward arrival was 13.1 h for all enrollees, and was significantly longer for substance users (median 15.4 h, IQR 5.5 – 25.5; p = 0.029).

Conclusion: In the population studied, reported substance use was common, with a substantial proportion of injured persons screening positive for hazardous alcohol use. Those with substance use had significant delays in attaining injury care. These data suggest a need for the development of programming for substance use disorder screening and care linkage in the ED.

References:
1. Janeway H, O’Reilly G, Schmachtenberg F, Kharva N, Wachira B. Characterizing injury at a tertiary referral
hospital in Kenya. PLOS ONE. 2019 Jul 24;14(7):e0220179.
2. Gathecha GK, Githinji WM, Maina AK. Demographic profile and pattern of fatal injuries in Nairobi, Kenya, January–June 2014. BMC Public Health. 2017 Jan 6;17(1):34.
3. Patel H, Suarez S, Shaull L, Edwards J, Altawil Z, Owuor J, et al. Patient Characteristics from an Emergency Care Center in Rural Western Kenya. J Emerg Med. 2019 Jan 1;56(1):80–6.
4. Sundet M, Kajumbo C, Mulima G, Bogstrand ST, Varela C, Young S, et al. Prevalence of alcohol use among road traffic crash victims presenting to a Malawian Central Hospital: A cross-sectional study. Traffic Inj Prev. 2020 Nov 16;21(8):527–32.
5. McDonald A, Duncan ND, Mitchell DI. Alcohol, cannabis and cocaine usage in patients with trauma injuries. West Indian Med J. 1999 Dec;48(4):200–2.
6. Bowley DM, Rein P, Cherry R, Vellema J, Snyman T, Boffard KD. Substance abuse and major trauma in Johannesburg. South Afr J Surg Suid-Afr Tydskr Vir Chrir. 2004 Feb;42(1):7–10.
7. Staton CA, Vissoci JRN, Toomey N, Abdelgadir J, Chou P, Haglund M, et al. The impact of alcohol among injury patients in Moshi, Tanzania: a nested case-crossover study. BMC Public Health. 2018 Feb 21;18(1):273.
8. Peden M, van der Spuy J, Smith P, Baurt P. Substance abuse and trauma in Cape Town. South Afr Med J Suid-Afr Tydskr Vir Genesekd. 2000 Mar;90(3):251–5.
9. Forson PK, Oduro G, Bonney J, Cobbold S, Sarfo-Frimpong J, Boyd C, et al. Emergency department admissions Kumasi, Ghana: Prevalence of alcohol and substance use, and associated trauma. J Addict Dis. 2020 Dec;38(4):520–8.

Daisley Barton syndrome: Spontaneous pneumothorax in paraquat poisoning

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Introduction: One-third of the world suicide is due to pesticide self-poisoning, in which paraquat poisoning causes mortality in many parts of Asia and America (1).

Description: A 51-year-old gentleman presented to the Emergency Department of a district hospital in Pahang, Malaysia complaining of breathlessness and lethargy after ingested 50mls of paraquat two days prior in a suicidal attempt. He is alert, conscious but appeared lethargic and tachypneic with oxygen saturation of 90% on room air. Systemic examination elicited reduced air entry over the right lung. Initial blood investigation showed deranged renal profile with urea 18.7 mmol/L and creatinine 464 umol/L. Chest radiograph (CXR) exhibited right pneumothorax with bilateral lung field infiltrates. Urine sodium dithionite test result was positive for paraquat.

Outcomes: A 28F-size intercostal drain was inserted. A repeat CXR showed expansion of the right lung with clinical improvement. Intermittent hemodialysis was done for this patient; however his renal function and general condition continued to deteriorate. Eventually patient succumbed to death after 4 days of admission. Paraquat is a bipyridium herbicide that is well known for its deadly sequelae. Respiratory failure is the most common cause of mortality in paraquat poisoning (2). Despite that, spontaneous pneumothorax following paraquat ingestion, also known as Daisley Barton Syndrome is a rare presentation of respiratory distress and possibly underreported(3).

Conclusion: This case highlights the rare presentation of respiratory distress in paraquat poisoning and should be considered in a patient presenting with respiratory distress in areas with a high incidence of paraquat poisoning.

References:
1. Gunnell D, Eddleston M, Phillips MR, Konradsen F. The global distribution of fatal pesticide self-poisoning: Systematic review. Vol. 7, BMC Public Health. 2007.
2. Shashibhushan J, Venugopal K, Lingaraja M, Patanjali C, Suresh C, Huggi V. Paraquat: A fatal poison. Medical Journal of Dr DY Patil University. 2015 May 1;8(3):370–4.
3. Daisley H, Barton E N. Spontaneous pneumothorax in acute paraquat toxicity. West Indian Med Journal. 1995 Sep;39(3):180–5.

A drowning heart: A 21-year-old male with cardiac tamponade secondary to massive pericardial effusion secondary to non-hodgkin's lymphoma—A case report

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Introduction: Cardiac tamponade is an increase in the amount of fluid within the pericardial sac which results in an increase in intrapericardial pressure. Pericardiocentesis is usually done in the operating room, but if there is hemodynamic instability, emergency pericardiocentesis is indicated in the emergency department.

Objectives: To discuss a case of cardiac tamponade secondary to massive pericardial effusion secondary to non-hodgkin's lymphoma
To discuss the clinical presentation and management done in the emergency department
To discuss and emphasize the importance of emergency pericardiocentesis

Description: This is a case of 21-year-old patient that was a brought in the emergency department via coordinated transfer due to dyspnea. Initial assessment of the patient was Obstructive Shock secondary to Cardiac Tamponade probably secondary to Massive Pericardial Effusion. A cardiac ultrasound was performed which
revealed massive pericardial effusion with collapsed right ventricle. Bedside ultrasound-guided emergency pericardiocentesis via subxiphoid approach was done, initial symptoms of dyspnea gradually improved and was eventually discharged after his stay in the hospital for 23 days.

Conclusions: As an Emergency Physician, who’s seeing and managing multiple patients at a time, working with limited information and resources, getting a comprehensive history and doing a thorough physical examination will always be a vital component in the management of our patients. Also, utilizing point-of-care ultrasound early on in managing patients such as in this case, allows us to provide efficient management and make rapid life-saving clinical decisions.

TRAnsitional CarE Strategies at Local EDs (TRACES@ED)–A cross-sectional study across 7 EDs in Singapore

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Background: Transitional Care Strategies (TCS) initiated for elderly patients prior to emergency department (ED) discharge are important to ensure effective transition to other care settings. ED attendances by elderly patients have been increasing (1), and local studies showed that TCS implemented at the ED potentially reduce avoidable acute admissions for elderly patients (2, 3).

Objectives: This study is targeted at public acute hospital EDs in Singapore, and aims to: (1) characterize TCS for ED-discharged elderly patients and (2) understand the facilitators and barriers of its implementation.

Method: Seven key informants (KI) (one per ED) completed an online structured questionnaire and semi-structured video-conference interview between 8 May to 31 August 2021. The KI was an ED specialist or ED-trained senior staff nurse, knowledgeable in geriatric emergency care and contributed to ≥1 elder-related TCS. Field notes were compiled, transcribed, anonymised, and analyzed using thematic analysis.

Results: All seven EDs have TCS as “usual care” available during office hours, at no extra costs to patients (Table 1). Common components of TCS include screening, evaluation with Comprehensive Geriatric Assessment (CGA), health education, and follow-up telecare. TCS implementation was facilitated by: established protocols, effective usage of communication platforms, collaboration between competent staff, training and

| ED | A | B | C | D | E | F | G |
|----|---|---|---|---|---|---|---|
| Overview of TCI | Elderly | Elderly | Elderly | Elderly | Elderly | Elderly | Elderly |
| Target Age | Elderly | Elderly | Elderly | Elderly | Elderly | Elderly | Elderly |
| Operating Hours | Weekdays, office hours | Weekdays, office hours | Weekdays, office hours | Weekdays, office hours | Weekdays, office hours | Weekdays, office hours | Weekdays, office hours |
| Components of TCI | Screen tool | None | None | None | None | None | None |
| Assessment tool | CGA | CFS | CFS | CFS | CFS | CFS | CFS |
| Patient Education | Face-to-face | Face-to-face | Face-to-face | Face-to-face | Face-to-face | Face-to-face | Face-to-face |

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TABLE 1 (Continued)

|                        | A | B | C       | D                                     | E | F | G                                       |
|------------------------|---|---|---------|---------------------------------------|---|---|------------------------------------------|
|                          |   |   | Face-to-face, Individualized written action plan | Patient education brochures, Face-to-face | Patient education booklet, Face-to-face | Patient education brochures, Face-to-face |
| Utilization of ED Observation Unit | Yes | Yes | Not | Applicable | Yes | Yes | Yes |
| Early In-person ED engagement by Geriatric Physicians | Yes | No | No | Yes | Yes | No | No |
| Early In-person ED engagement by Allied Health Professionals | Yes | Pharmacist | Yes | No | Yes | Yes | Yes |
| Transition to ILTC Services | Yes | Yes | No | Yes | Yes | Yes | Yes |
| Post-discharge helpline availability for patients | No | No | No | Yes | Yes | Yes | No |

*Abbreviations: ER 2 - Emergency Room Evaluation and Recommendation; CFS – Clinical Frailty Scale; TRST – Triage Risk Screening Tool; CGA – Comprehensive Geriatric Assessment; PT – Physiotherapist; MSW – Medical Social Worker; OT – Occupational Therapist; CC - Care Coordinators; ST - Speech Therapist; ILTC – Intermediate and Long Term Care.
increased awareness of ED personnel, and involvement of caregivers. Obstacles faced include: fragmented communication between personnel, limited resources, poor buy-in from stakeholders.

**Conclusion:** Heterogeneity of TCS for ED-discharged elderly patients was noted. These findings help inform future strategies for TCS implementation and delivery. More research is needed to evaluate patient outcomes and cost-effectiveness of TCS.

**Table format if included:**

**References:**
1. Gan E. At emergency departments, more patience for elderly patients: Today; 13 February 2018 [Available from: .
2. Chong E, Zhu B, Tan H, Molina JDC, Goh EF, Baldevarona-Llego J, et al. Emergency Department Interventions for Frailty (EDIFY): Front-Door Geriatric Care Can Reduce Acute Admissions. Journal of the American Medical Directors Association. 2021;22(4):923–8.e5.
3. Foo CL, Siu VWY, Tan TL, Ding YY, Seow E. Geriatric assessment and intervention in an emergency department observation unit reduced re-attendance and hospitalization rates. Australasian Journal on Aging. 2012;31(1):40–6.

**The Role of IGF-IIIRα on regulating apoptosis in the diabetic heart**

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**Background:** In recent years, diabetes is on the rise worldwide which is well-known as a metabolic disease with high blood sugar levels. Among them, diabetes-induced cardiovascular failure is one of the most causes leading to morbidity and mortality. In our previous studies, IGF-IIIRα plays a critical role in the aggravation of heart disease. However, the role of IGF-IIIRα on the diabetic heart remains unknown.

**Objectives:** In this study, we want to further investigate whether IGF-IIIRα regulates cardiac cell death in the diabetic heart.

**Method:** We used overexpression of IGF-IIIRα transgenic mice with a streptozotocin-induced diabetic heart disease model to access the role of IGF-IIIRα on apoptosis.

**Results:** Our results demonstrated that the heart sizes of transgenic mice were significantly increased than non-transgenic mice. We also found the myocardial structure and the myocardial tissue connection in the transgenic mice group were slightly looser than the wild-type mice group. Finally, we have confirmed that apoptotic and Akt-PI3K signal pathways were involved in IGF-IIIRα regulating apoptosis by western blot analysis.

**Conclusion:** Collectively, our overall goal is to gain a better understanding of the molecular mechanism of IGF-IIIRα on apoptosis in diabetic heart cells. Our findings will provide new insight into the development of diabetic cardiomyopathy.

**Keywords:** Diabetic cardiomyopathy, STZ mice model, IGF-IIIRα, Apoptosis, Akt-PI3K signal pathway.

**The influence of national institutes of health stroke scale (NIHSS) and onset-to-angiography time on neurological outcome among patients with acute ischemic stroke receiving neuro-endovascular therapy**

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**Background:** Acute ischemic stroke is one of the critical diseases in the emergency department, and early reperfusion therapy including intravenous thrombolysis and neuro-endovascular therapy (NET) improved outcomes. In patients with large vessel occlusion, onset-to-angiography time (OAT) is important for timely reperfusion and better prognosis.

**Objectives:** The purpose of this study was to investigate the impact of the National Institutes of Health Stroke Scale (NIHSS)-time score on one-month neurological functional status.

**Method:** We conducted a single-center retrospective cohort study of adults (age ≥18 years) with acute ischemic stroke of large vessel occlusion undergoing NET between January 2015 and December 2018. Favorable outcome was defined as the modified Rankin Scale (mRS) score of 2 or lower. The NIHSS-time score was calculated by the multiply of pre-NET NIHSS score and OAT. We performed multivariate logistic regression analysis to assess the association between the NIHSS-time score and favorable outcomes.

**Results:** After selection, 300 adult ischemic stroke patients of large vessel occlusion receiving NET were included, including 65 patients with favorable outcomes and 235 patients with unfavorable outcomes. Multivariate-adjusted logistic regression revealed a NIHSS-time score less than 4093 was significantly associated with favorable one-month neurological function [OR (95% CI) = 2.94 (1.56–5.56), p < 0.001].
Conclusion: Patients with NIHSS-time score less than 94 had a more favorable one-month neurologic functional prognosis. Early NET in stroke patients with large vessel occlusion may be critical for neurological outcomes.

A rare encounter of clivus fracture complicated with brainstem infarct in a 5 year-old child
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Introduction: Fractures in the clivus region are rare and usually associated with high impact head trauma. It is frequently associated with a high rate of complications and neurological sequelae.

Case: We reported a case of 5-year-old boy who had a fall from the lifted longhouse and landed onto erected metal bars on the ground. Post trauma, he sustained loss of consciousness and laceration wounds over left submandibular, supraclavicular and anterolateral chest wall. Upon arrival at Emergency Department, he was unconscious with Glasgow Coma Scale (GCS) of 5/15 (E1V1M3), bilateral pupils were sluggish and was intubated for airway protection. Initial plain CT Brain and Cervical showed left inframandibular soft tissue injury with multiple foreign bodies, left submandibular gland injury, and non-displaced midclavicle fracture. There was no obvious intracranial hemorrhage or skull fracture seen. He was subsequently transferred to tertiary hospital with neurosurgery specialty for further management. In view of poor GCS recovery, CT Angiography and Contrast-enhanced CT brain was done on day-4 post trauma which showed comminuted clivus fracture with mass effect, left submandibular gland injury, and no-displaced midclavicle fracture.

Conclusion: In summary, clivus fracture is very uncommon and its presence should alert clinician of the potential associated significant brainstem and vascular trauma which is high risk of mortality.

References:
1. Lagrand TJ, Bruijnes VAJ, Van der Stouwe AMW, Deckers EA, Mazuri A, Jacobs B (2020) Locked-in syndrome after traumatic basilar artery entrapment within a clivus fracture: a case report and review of the literature, Neurotrauma Reports 1:1, 73–77, DOI:10.1089/neur.2020.00015.
2. Menkii, A., Koç, R.K., Tucer, B. et al. (2004) Clivus fractures: clinical presentations and courses. Neurosurg Rev 27, 194–198, https://doi.org/10.1007/s10143-004-0320-2
3. Pawel G. Ochalski., Richard M. Spiro., Anthony Fabio, M.P.H., Amin B. Kassam., David O. Okonkwo, FRACUTES OF THE CLIVUS: A CONTEMPORARY SERIES IN THE COMPUTED TOMOGRAPHY ERA, Neurosurgery, Volume
Effect of the COVID-19 pandemic on EMS volumes in Virginia (USA)

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Background: On March 12, a state of emergency was issued for the commonwealth of Virginia with a ‘stay at home’ order issued on March 30. As a result, significant changes in healthcare utilization was observed including decreased emergency department visits. We investigate the effects of the COVID-19 pandemic on 9–1–1 EMS call volumes.

Objectives: To describe the impact of COVID-19 pandemic on the number of emergency medicine services (EMS) calls in the state of Virginia.

Method: Analysis of the number of 9–1–1 EMS calls during February 1 2020 to December 31 compared with the same time frame in 2019 for STEMI, chest pain, and cardiac arrests. Two-way ANOVA analysis was utilized.

Results: Total 9–1–1 EMS calls were 1,228,615 vs 1,164,399 (p = 0.001). Cardiac arrests increased 19.5% during this time period (39,685 vs 33,184, p = 0.008). Calls for chest pain decreased 16.8% (46,045 vs 55,384, p = 0.008) and STEMs increased 5.9% (2,575 vs 2,736, p = 0.018). In comparing months between 2020 and 2019, 9–1–1 EMS calls were decreased for stroke March, April, and May, whereas calls for chest pain were decreased every month from March through December. Cardiac arrests were increased every month in 2020 compared to 2019 from April to December.

Conclusion: COVID-19 9–1–1 EMS calls decreased during the 2020 timeframe compared with 2019. In particular, calls for chest pain calls had decreased while cardiac arrests and STEMs increased. Further research investigating why the change in 9–1–1 EMS calls are needed.

Cost analysis of the NIRUDAK clinical diagnostic model for volume deficit in patients with acute diarrhea

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Background: With over 6.5 billion cases and 1.4 million deaths in 2019, diarrheal diseases are a major cause of morbidity and mortality and place a heavy burden on healthcare systems worldwide.

Objectives: This study aims to compare simulated treatment costs of acute diarrhea management using the World Health Organization (WHO) guidelines or the recently developed NIRUDAK model to the actual cost of care in patients over 5 years old.

Method: Cost of care for each patient included fluid administered, hospital costs, and equipment for patients presenting to icddr, b’s Dhaka Hospital from March 2019–2020. Total costs of resuscitation along with cost of fluid required for initial resuscitation (within first 6 h of admission) were calculated and reported as median and interquartile range (IQR) in USD.

Results: Using the NIRUDAK model, patients had a median projected total cost of $5.18 (IQR: 0–25.56), while median projected total costs using the WHO guidelines were $5.23 (IQR: 5.09–22.17). Actual total cost of care was $37.75 (IQR: 15.69–45.00). When isolating costs for initial fluid resuscitation, the median projected cost per patient was $3.27 (IQR: 0–4.27) using the NIRUDAK model and $4.55 (IQR: 0–5.76) using the WHO guidelines, while actual costs of care were $5.43 (IQR: 4.16–5.43).

Conclusion: When using the NIRUDAK model to predict dehydration severity, patients had lower projected median total cost of care and cost of initial resuscitation compared to both the WHO guidelines and current clinical practice. Implementing the most cost-effective approach to diarrhea management will help optimize allocation of resources, which is especially critical in low resource settings.

Prevalence and predictors of poor outcome in children with febrile neutropaenia presenting to the emergency department

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On behalf of the Australian PICNICC study group and the PRE-DICT Network,

**Background:** Children with acquired neutropaenia due to cancer chemotherapy are at high risk of severe infection.

**Objectives:** This study aims to describe the prevalence and predictors of poor outcomes in children with fever and neutropaenia (FN).

**Method:** A multi-center, prospective observational study in tertiary Australian Emergency Departments. Cancer patients with FN were included. Fever was defined as a single temperature >38°C, and neutropaenia was defined as an absolute neutrophil count <1000/mm³. The primary outcome was the intensive care unit (ICU) admission for organ support therapy (inotropic support, mechanical ventilation, renal replacement therapy, extra-corporeal life support). Secondary outcomes were: ICU admission, ICU length of stay (LOS) ≥3 days, proven or probable bacterial infection, hospital LOS ≥7 days, and 28-day mortality. Initial vital signs, biomarkers (including lactate), and clinical sepsis scores including: Systemic Inflammatory Response Syndrome (SIRS), quick Sequential Organ Failure Assessment (qSOFA), and quick Pediatric Logistic Organ Dysfunction-2 (qPELOD-2) were evaluated as predictors of poor outcomes (Table 1).

**Results:** Between December 2016 and January 2018, 2124 episodes of fever in children with cancer were screened, 547 episodes in 334 children met inclusion criteria. Four episodes resulted in ICU admission for organ support therapy, nine episodes required ICU admission, ICU LOS ≥3 days or hospital LOS 7 days, and two patients died within 28 days. Vital signs, blood tests, and clinical sepsis scores performed poorly as predictors of these outcomes (AUROC <0.6) (Table 2).

**Conclusion:** Very few patients with FN required ICU-level care. Vital signs, biomarkers, and clinical sepsis scores for the prediction of poor outcomes are of limited utility in children with FN.
TABLE 2. Test characteristics of initial vital signs, blood tests, and sepsis scores for predicting ICU admission for organ support therapy (n = 4)*

| Variable (frequency) | TP | FP | FN | TN | Sens (%) | Spec (%) | PPV (%) | NPV (%) | AUROC (95% CI) |
|----------------------|----|----|----|----|-----------|----------|---------|---------|----------------|
| Vital Signs:         |    |    |    |    |           |          |         |         |                |
| Hypotension (n = 311)| 4  | 307| 0  | 236| 100       | 43.5     | 1.3     | 100     | 0.72 (0.16–0.83) |
| Blood Tests:         |    |    |    |    |           |          |         |         |                |
| Lactate 2mmol/L (n = 60) | 1  | 59 | 3  | 484| 25.0      | 89.1     | 1.7     | 99.4    | 0.57 (0.42–0.62) |
| Lactate 4mmol/L (n = 6) | 0  | 6  | 4  | 537| 0         | 98.9     | 0       | 99.3    | 0.50 (0.39–0.68) |
| Sepsis Scores:       |    |    |    |    |           |          |         |         |                |
| SIRS (n = 273)       | 4  | 269| 0  | 274| 100       | 50.5     | 1.5     | 100     | 0.75 (0.35–0.83) |
| qSOFA (n = 4)        | 0  | 4  | 4  | 539| 0         | 99.3     | 0       | 99.3    | 0.50 (0.39–0.65) |
| qPELOD-2 (n = 1)     | 0  | 1  | 4  | 542| 0         | 99.8     | 0       | 99.3    | 0.50 (0.42–0.59) |

ICU=intensive care unit, SIRS=Systemic Inflammatory Response Syndrome, PELOD=Pediatric Logistic Organ Dysfunction Score, TP=true positive, FP=false positive, TN=true negative, FN=false negative, Sens=sensitivity, Spec=specificity, AUROC=area under the receiver operating characteristics curve, CI=confidence interval. *Data were missing for blood pressure in 3 episodes, for lactate in 190 episodes. Missing data were assumed to be normal.

References:
1. Goldstein B, Giroir B, Randolph A. International pediatric sepsis consensus conference: definitions for sepsis and organ dysfunction in pediatrics. *Pediatr Crit Care Med.* 2005; 6: 2–8.
2. Schlapbach LJ, Straney L, Bellomo R, MacLaren G, Pilcher D. Prognostic accuracy of age-adapted SOFA, SIRS, PELOD-2, and qSOFA for in-hospital mortality among children with suspected infection admitted to the intensive care unit. *Intensive Care Med.* 2018; 44: 179–88.
3. Leclerc F, Duhamel A, Deken V, Grandbastien B, Leteurtre S. Can the Pediatric Logistic Organ Dysfunction-2 Score on Day 1 Be Used in Clinical Criteria for Sepsis in Children? *Pediatr Crit Care Med.* 2017; 18: 758–63.
4. Leteurtre S, Duhamel A, Salleron J, Grandbastien B, Lacroix J, Leclerc F. PELOD-2: an update of the PEdiatric logistic organ dysfunction score. *Crit Care Med.* 2013; 41: 1761–73.

**“The brain and the bladder”: Symptomatic hyponatremia secondary to acute urinary retention, a case report**

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**Introduction:** Hyponatremia occurs when there is an excess of total body water in relation with total exchangeable body sodium and potassium (Edelman et al., 2018). A patient is hyponatremic when the plasma sodium concentration falls below 135 mmol/L. Common causes include diuretic use, diarrhea, heart failure, liver disease, renal disease, and the syndrome of inappropriate antidiuretic hormone secretion (SIADH). This is a case of symptomatic hyponatremia with noted Serum Na level of 97 mmol/L triggered by acute urinary retention. In elderly, chronic urinary retention may be a common yet unnoticed cause of hyponatremia, for which treatment can be offered.

**Description:** Symptomatic hyponatremia is a rare sequela of acute urinary retention. It is a medical matter that necessitates prompt and appropriate management. Hyponatremia in elderly subjects is usually multifactorial caused by some medications (more frequently loop diuretics and antidepressants), aging, diminished thirst mechanism, or age-related reduction in glomerular filtration rate as well as Syndrome of inappropriate anti diuretic hormone secretion (SIADH). This is a case of 66-year-old male with symptomatic hyponatremia noted with altered sensorium and confusion who had acute urinary retention. His symptoms improved with appropriate and non-rapid serum sodium correction during hospitalization and subsequent catheterization.

**Outcomes:** Appropriate and non-rapid serum sodium correction during hospitalization and subsequent catheterization contributed to improvement of symptomatic hyponatremia caused by acute urinary retention.

**Conclusions:** Impaired bladder emptying may be a result of urethral obstruction due to enlarged prostate gland. It is common yet underdiagnosed condition. Potentially, urinary retention by itself may cause hyponatremia. The possible mechanism for this is SIADH, triggered by bladder distention or pain due to bladder distention. Urinary catheterization may be the key to treatment in these cases of hyponatremia as well as conservative correction of sodium deficits.

**Codesigning care transition from ED to home: Being your best–An innovative approach to frailty**

Judy Lowthian1,2, Maja Green1,
Background: Frailty is characterized by increased vulnerability and decline of physical and cognitive reserves. It mainly affects older people, leading to a cascade of repeated hospitalizations and loss of independence. Frailty and pre-frailty are modifiable with interventions including physical exercise, cognitive training, social connection, and improved nutrition, especially in group settings. Uptake of referrals to services following Emergency Department (ED) discharge is sub-optimal, indicating that a more proactive, person-centered and integrated approach is required.

Objectives: To co-design a program to help pre-frail and frail older community dwellers following ED discharge, by increasing resilience and promoting independence.

Methods: We engaged healthcare consumers and healthcare professionals from three hospitals and a home-based nursing service in metropolitan Melbourne, Australia.

Results: From co-design sessions with 23 healthcare consumers and 17 healthcare professionals, frailty was perceived to affect physical and mental wellbeing. The co-design process resulted in the Being Your Best program incorporating a holistic approach, that aimed to improve health and wellbeing and mitigate the effects of frailty through community- or home- based physical activities, nutritional support, cognitive training, and social support. These four domains are supported by research evidence: Moving Well, Eating Well, Thinking Well, and Connecting Well.

Conclusion: Promoting community or home-based services for pre-frail and frail older people can raise awareness and may help in reducing the effects of frailty and improving personal wellbeing, leading to increased resilience and independence, and less re-hospitalizations.

Being Your Best is now being tested for feasibility and acceptability with patients recently discharged from ED.

References:
1. Green MM et al Co-designing Being Your Best program — A holistic approach to frailty in older community dwelling Australians. 2021 Health Soc Care Community DOI: 10.1111/hsc.13636
2. Lowthian JA et al. Being Your Best: protocol for a feasibility study of a codesigned approach to reduce the symptoms of frailty in people aged 65 years or more after transition from hospital. 2021 BMJ Open 11:e043223. doi:10.1136/bmjopen-2020-043223

Japanese medical students’ awareness of cardiopulmonary resuscitation in the context of COVID-19 pandemic

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Background: No study has investigated Japanese medical students’ awareness of the modified CPR and ALS procedures in the context of the COVID-19 pandemic.

Objectives: To evaluate Japanese medical students’ awareness of newly recommended cardiopulmonary resuscitation (CPR) and airway management procedures in the context of the COVID-19 pandemic.

Method: An online survey was sent in December 2020 to all medical students at Hirosaki University in Japan. The survey included 15 questions and quizzes regarding prior experience of learning the new CPR guidelines in response to COVID-19, knowledge of conventional CPR, and COVID-19 context CPR and airway management procedures.

Results: Of all medical students at the university, 457 (57.1%) responded to the survey. Among these, 22% reported that they were knowledgeable about CPR procedure in the COVID-19 pandemic setting. Prior knowledge of CPR in the context of COVID-19 was a significant positive predictor of quiz score regarding the CPR procedure (β = 0.60, p < 0.01) and the airway management procedure (β = 0.34, p < 0.02) in the context of the COVID-19 pandemic.

Conclusion: Medical students with experience learning the new COVID-19 context CPR guidelines had sufficient knowledge of CPR and advanced airway management procedures in the setting of the COVID-19 pandemic. Implementation of a formal medical education curriculum based on the newly recommended CPR and Advances life support guidelines is needed to improve medical students’ awareness of cardiopulmonary resuscitation.
awareness and skills of CPR and airway management in the context of the COVID-19 pandemic.

References:
1. Çalışkan F, Midik Ö, Baykan Z, et al. The knowledge level and perceptions toward COVID-19 among Turkish final year medical students. Postgrad Med. 2020; 1–9.
2. Abd Samat AH, et al. (2020) Knowledge and Confidence Level Among Emergency Healthcare Workers in Airway Management and Resuscitation of Suspected COVID-19 Patients: A Cross-Sectional Study in Malaysia. Ann. Acad. Med. Singap. 2020; 49: 643–51.
3. Chong KM, Chen JW, Lien WC, et al. Attitude and behavior toward bystander cardiopulmonary resuscitation during COVID-19 outbreak. PLoS One. 2021; 16(6): e0252841.
4. Kanda Y. Investigation of the freely available easy-to-use software ‘EZR’ for medical statistics. Bone Marrow Transplant. 2013; 48: 452–8.
5. Nomura O, Irie J, Park Y, Nonogi H, Hanada H. Evaluating Effectiveness of YouTube Videos for Teaching Medical Students CPR: Solution to Optimizing Clinician Educator Workload during the COVID-19 Pandemic. Int. J. Environ. Res. Public Health 2021; 18: 7113.

Literature review: Intra-articular lidocaine injection versus procedural sedation for anterior shoulder dislocation

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Introduction: Intravenous procedural sedation has reported 25% of adverse effects, including hypoxia and myoclonus (1). Is Intra-articular lidocaine injection safe, providing the same or better success rate and pain relief than procedural sedation in reducing anterior shoulder dislocations?

Description: A literature search was conducted using PubMed, OvidSP Platform, Google Scholar, BestBETs,
TABLE 2 (summary of the selected studies)

| Study (reference) | Population | Intervention & Outcome | Key results | Comments |
|-------------------|------------|------------------------|-------------|----------|
| Moharari et al.   | *48 participants | *Intervention: Intra-articular lidocaine 1% injection | *Pain relief is similar in both groups with more complications rate in IVMD group with (58.3%) versus (12.5%) in IAL group (P = 0.001) | *Power calculation is not described. |
|                   | *Age: 18 - 80 | *Outcomes: 1-Pain relief 2-Complications |             |          |
|                   | *Anterior shoulder dislocation. |             |             |          |
| Cheok et al.      | *63 participants | *Intervention: Intra-articular lidocaine 1% injection. | *The IVS group had a 100% success rate vs 81% in IAL group (P = 0.024) | *Power calculation is not described. |
|                   | *Age >15 | *Outcomes: 1-Success rate. 2-Pain scale. 3-Length of time since dislocation. 4-Ease of reduction. 5-Patient satisfaction. 6-Adverse effect. 7-Duration of hospitalization | *Pain relief and patient satisfaction are almost equal. *IAL group had a shorter duration of hospitalization and no reported complications; IVS group has 29% complication rate. | |
|                   | *Anterior shoulder dislocation. |             |             |          |
|                   |             |             |             |          |
| Hames, et al      | *44 participants | *Intervention: Intra-articular lidocaine 1% injection | *Success rate in IAL group was (48%) vs (100%) in IVS (P<0.001) | *Study was stopped after 2.5 years recruitment time. |
|                   | *Age >16 | *Outcomes: 1- Length of stay 2- Rate of success. 3- Patient satisfaction. 4-Complications. | *Patient satisfaction and physician ease of reduction were higher in IVS group. | *Sedation medications were propofol with fentanyl or ketamine which allowed faster recovery. |
|                   | *Anterior shoulder dislocation |             | *Length of stay was not significantly different between the two groups. *No complications in either group at the time of the procedure or at follow-up 2 weeks later (28 out of 44 pts). | *High failure rate can be explained by lack of enough training. |
| Kashani et al     | *104 participants | *Intervention Intra-articular lidocaine 1% injection | *Higher patient satisfaction in IVS group (p = 0.007). | *Limited age group < 40 |
|                   | *Age:18–40 | *Outcomes: compare safety and efficiency between two groups | *No difference in pain intensity. *Complications were only observed in IVS group. *Equal success rate | *Largest sample size. |
Grey literature, The Cochrane Library from 1946 to March 21 2020. The randomized controlled trials (RCTs) were studied and appraised using the Cochrane risk-of-bias tool (table1).

**Outcomes:** From 31 potentially relevant studies, 4 RCTs, and one meta-analysis were published between 2005 and 2016 and included in this systematic review (table2).

Synthesis of the 4 RCTs results showed: A total of 259 patients with anterior shoulder dislocation were enrolled: 133 received Intra-articular lidocaine (IAL), and 126 received intravenous sedation (IVS). The success rate was 115/133 in the IAL group (86.4%) vs 120/126 (95.2%) in the IVS group, an insignificant statistical difference. Overall, pain relief was similar in both groups. The most common complication among the IVS group was respiratory depression (61%), while drowsiness was reported in 4/133 (3.07%).

**Conclusions:** IAL has lower complication rates and similar reduction and pain relief effectiveness compared to IVS. Large-scale trials focusing on using modern sedation techniques and long-term effects of IAL injection are required.

**Reference:**
1. Taylor DM, O’Brien D, Ritchie P, Pasco J, Cameron PA. Propofol versus midazolam/fentanyl for reduction of anterior shoulder dislocation. Academic Emergency Medicine. 2005 Jan;12(1):13–9.

**A completed audit cycle examining quality improvement pre and post introduction of emergency department (ED) multidisciplinary simulation based medical education training on the Tallaght University Hospital hip fracture pathway to achieve gold standard care as per Irish hip fracture standard 1**

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**Background:** The care of patients with hip fractures is a surrogate marker of trauma care. Irish Hip Fracture Standard 1 (IHFS1) involves patients with a hip fracture being admitted to an Orthopedic ward bed within 4 h of attending the ED.

**Objectives:** To audit our current practice and introduce a quality improvement project to improve the timeliness and efficiency of care of our hip fracture patients compared with the gold standard IHFS 1.

**Method:** We performed a retrospective audit of patients presenting to TUH ED with a proximal third of femur fracture between 4 February and 31 March inclusive in 2020 and 2021, pre and post MDT Hip fracture pathway simulation based training. The simulation episode was a 90 minute long real-time session from door to ward transfer with EM and Orthopedic doctors, EM CNM and nurses, radiology and radiography, porters, pre-hospital staff all in attendance. Data
A retrospective audit of co-prescribing non-opioid analgesia with opioids in adults discharged from the emergency department (ED)

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Background: For discharge prescribing in acute pain, the Australian and New Zealand College of Anesthetists (ANZCA) recommend a multimodal analgesic strategy to facilitate opioid weaning and a reduction in overall opioid use [1]. This approach has been demonstrated to have an opioid sparing outcome for acute pain management where the effect is optimal when opioid and non-opioid analgesia are prescribed in separate preparations to allow for opioid tapering.

Objectives: To determine the rate of co-prescribing opioid and non-opioid analgesia, as both combined and separate formulations, for patients being discharged from three Australian Emergency Departments (ED).

Method: All patients discharged in 2019 from three Australian EDs with a discharge prescription for an oral opioid were included in this analysis.

Results: 17,370 prescriptions were included in this analysis. 9.9% of patients who were prescribed an opioid were also prescribed non-opioid analgesia as a separate formulation. 41.9% were prescribed a combination opioid/non-opioid tablet and 48.2% were prescribed an opioid alone. Further sub-analysis including a breakdown by age, gender, ED sites and oral morphine equivalent dose (oMED) is pending but will be available at the time of abstract presentation.

Conclusion: Only half (51.8%) of ED patients received discharge scripts for both opioid and non-opioid analgesia and less than 10% were prescribed these as separate formulations. This limits the opioid sparing intention of multimodal analgesia regimes, prevents appropriate opioid tapering and may promote ongoing opioid use. Further work is required to identify the drivers behind these prescribing practices and to determine methods by which they can be improved.

Reference:
1. Schug SA, Palmer GM, Scott DA, Halliwell R, Trinca J. Acute Pain Management: Scientific Evidence (4th edition). Melbourne. Working Group of the Australian and New Zealand College of Anesthetists (ANZCA) and Faculty of Pain Medicine (FPM); 2015. 716 p. Report No.: 4
primary outcome was triage and transportation status; secondary outcomes included 30-day mortality, and discharge destination.

Methods: Retrospective observational study analyzing trauma patients >65 years of age presenting to either the level I trauma center, or a local non-trauma hospital via QAS, with an ICD-10 trauma code, between June 2016 and May 2017. Patients were excluded if they did not meet the above criteria, had missing QAS data, or had sustained an isolated neck of femur fracture.

Results: There were 1431 elderly trauma patients identified in the time frame. 927 patients had adequate triage and transport data. Of the 178 trauma trigger positive patients, 19 (10.7%) were both incorrectly transported and under-triaged, 12 (63.2%) of which were missed on the observation trigger (p = 0.009). Increasing age (75 vs 81 p = <0.006), high-care nursing home residency (9 (5.7%) vs 4 (21.1%) p = 0.036), and a higher number of co-morbidities (23 (14.5%) vs 8 (42.1%) p = 0.007) were all significantly associated with increasing rates of destination non-compliance and under- triage. There was no association between mortality and transport status.

Conclusion: QAS appropriately implement the trauma bypass protocol in the majority of cases. However, increasing age, higher co-morbidities, and residing in a HCNH were all associated with under- triage and destination non-compliance. Triage and transport decisions had minimal impact on patient outcomes.

Collective intelligence and the psychologically safe resuscitation bay

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Background: In an active Emergency Department (ED), simulation at Belmont Hospitals ED with BEAST (Belmont Emergency Acute Skills Simulation Program) is an innovative project for developing technical, behavioral, and cognitive skills in an open environment. These high-fidelity scenarios encompass Ambulance, Nursing Staff and Medical officers from the pre-hospital setting to the resuscitation bay.

Objectives: Patient safety is a primary outcome achieved through clinician development. Improving teamwork, communication, and handover through a unique multi-disciplinary team (MDT) experience. In the post-scenario debrief, medical error would be the primary discussion point, developing psychological safety and professional growth, giving members a ‘mistake toolkit’ to draw upon when faced with future clinical challenges.

Methods: Monthly sessions include targeted education, simulation scenario, and debrief. The simulation brief and debrief emphasized the importance of practicing with the MDT in situ, recognizing errors within the simulation and being able to raise this in a constructive way to encourage reflective practice.

Feedback: 80 respondents across 4 sessions provided feedback on the usefulness and quality of the sessions, with 80/80 in agreement. Participants were asked what they learned from the sessions, with 70 responses grouped into Teamwork (27%), Communication (28%) and Management (43%) demonstrating the large variation of learning points within the sessions.

Conclusions: BEAST acts as an equitable teaching tool by building upon traditional simulation, with the diversification of professions and seniority, this program is improving collective intelligence and group wisdom in a psychologically safe environment.

Reference:
1. Patel H, McDonald C, Sharrock N, Taylor B, Bond J. Taming The B.E.A.S.T. Australasian College of Emergency Medicine Winter Symposium 2021, Cairns. Poster Presentation.

Measuring occupational stress in emergency doctors and nurses

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Background: Emergency departments (EDs) are demanding workplaces with high occupational stress. Occupational wellbeing is multifactorial and influenced by individual and organizational characteristics. Previous research has been limited by a focus on narrow aspects of the working environment.

Objectives: This study aimed to describe the perceptions of occupational stress and coping strategies of ED nurses and doctors.

Method: This cross-sectional study was conducted at one public metropolitan hospital ED in Queensland, Australia. All ED nurses and doctors were invited to participate in an electronic survey containing 11 survey measures assessing perceived occupational stress and coping experiences in the workplace. Descriptive statistics were used to report stressors for overall cohort, and by profession. Responses to open-ended questions were thematically analyzed.

Results: 104 nurses and 35 doctors responded (55.6% response rate). Nurses reported higher levels of stress and burnout than doctors. They also reported lower work satisfaction, work engagement, and leadership support than doctors. Compared with doctors, nurses reported significantly higher stress from heavy workload/poor skill mix, high acuity patients, environmental concerns (e.g., overcrowding), and inability to provide optimal care. Thematic analysis identified high workload and limited leadership...
and management support as factors underpinning stress. Coping mechanisms included building personal resilience. **Conclusion:** This study found organizational stressors impact ED nurses more than doctors. Organizational focused interventions including adequate staffing, strategic recruitment, leadership development, and appropriate resources may help mitigate stress and complement individual coping strategies staff already use. Expanding this research nationally and longitudinally to understand broader perspectives is needed.

**References:**
1. Basu S, Qayyum H, Mason S. Occupational stress in the ED: a systematic literature review. Emerg Med J. 2017;34(7):441–7.

2. Cotton P, Hart PM. Occupational Wellbeing and Performance: A Review of Organizational Health Research. Australian psychologist. 2003;38(2):118–27.

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**The introduction of a post-triage mental health triage tool in Ireland**

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**Introduction:** Emergency Departments (EDs) have experienced an increasing number of patients presenting with acute mental health needs. Emergency Nurses in Ireland and other jurisdictions recognized that the 5-point triage systems used did not optimally prioritize this patient group. Australia developed and refined a mental health triage system, which we have adopted and adapted for our specific needs.

**TABLE 1: Post-Triage Mental Health Triage Tool**

| Description | Treatment acuity | Typical Presentation | Emergency Department Guidance |
|-------------|------------------|----------------------|------------------------------|
| **1** | **Definite danger to life** *(Self or others)* | Immediate | Supervision<br>- Continuous visual supervision 1:1 ratio **<br>- Location<br>- Identify at each site i.e. Mental Health assessment area<br>- Remove equipment from cubicle<br>- Action<br>- Ensure security in attendance<br>- Alert the following staff members immediately and ensure prompt assessment of the patient:<br>1. CNM 2/Shift Leader<br>2. EM Registrar<br>3. Psychiatric Registrar<br>4. Psychiatric Liaison Nurse<br>- Remove any potentially dangerous objects and/or substances from patient<br>- Establish patient’s past medical history<br>- Ensure medical assessment is performed |  |
| **2** | **Probable risk to self or others** | Very Urgent<br>To be seen within 10 min | Supervision<br>- Continuous visual supervision 1:1 ratio **<br>- Location<br>- Identify in each site i.e. Mental Health assessment area<br>- Action<br>- Ensure security in attendance<br>- Alert the following staff members immediately; <br>1. CNM 2/Shift Leader<br>2. EM Registrar<br>3. Psychiatric Registrar<br>4. Psychiatric Liaison Nurse<br>- Remove any potentially dangerous objects and/or substances from patient<br>- Establish patient’s past medical history<br>- Ensure medical assessment is performed |  |
| Description | Treatment acuity | Typical Presentation | Emergency Department Guidance |
|-------------|-----------------|----------------------|-------------------------------|
| 3 Possible danger to self or others | Urgent, To be seen within 60 min | Observed/Reported | - Remove any potentially dangerous objects and/or substances from patient  
- Provide a safe environment for patient and others  
- Establish patient’s past medical history  
- Ensure medical assessment is performed -  
Supervision  
Close observation **  
Location  
Identify in each site i.e. sub-waiting area  
Remove equipment from cubicle  
Action  
- Inform the following members of staff;  
  • CNM 2/Shift Leader  
  • ED medical staff  
  • Psychiatric Liaison Nurse#  
- Remove any potentially dangerous objects and/or substances from patient  
- Ensure security aware of patient’s physical appearance and location in ED  
- Alert Psychiatric Registrar if review deemed necessary by EM medical staff  
- Re-triage if evidence of increasing behavioral disturbance  
- Establish patient’s past medical history  
- Ensure medical assessment is performed  
Supervision  
Routine observation **  
Location  
If patient is unaccompanied, identify suitable location i.e. waiting room or sub-wait area  
Action  
- Inform the following members of staff;  
  • CNM 2/Shift Leader  
  • ED medical staff  
  • Psychiatric Liaison Nurse#  
- Alert psychiatric Registrar if review deemed necessary by ED medical staff |
| 4 Moderate distress | Semi-urgent, To be seen within 120 min | Observed/Reported | - No agitation or restlessness  
- Irritable without aggression  
- Cooperative  
- Gives coherent history  
- Pre-existing mental health disorder  
- Symptoms of anxiety or depression without suicidal ideation |

(Continues)
The Post-Triage Mental Health Triage Tool (PTMHTT) was introduced to meet the need of this patient group. The PTMHTT is an adaptation of the Victorian Emergency Department Mental Health Triage Tool devised in Australia. The tool has face validity and has been shown to have predictive validity. Triage nurses who use it were found to accurately identify the urgency of mental health presentations using defined criteria.

Process:
The PTMHTT guides Emergency Department (ED) staff in prioritizing and caring for adult patients presenting with apparent acute mental health needs. It provides descriptors of observed and reported behavior to assist in allocating the most appropriate triage category (see Table 1). All ED patients continue to be initially triaged using the Manchester Triage System (MTS). The PTMHTT is then used following the identification of an apparent acute mental health need. Patients with acute mental health needs therefore, have two triage scores, the higher priority score always takes precedence.

Conclusion: The introduction of the PTMHTT has increased nurses confidence in prioritising and safely managing patients who present with acute mental health needs while in the ED.

References:
1. National Institute of Clinical Excellence, Clinical Guideline 16, 2011
2. Broadbent M, Moxham L, Dwyer T. The development and use of mental health triage scales in Australia. International Journal of Mental Health Nursing (2007) 16, 413–421
3. Sands N, Elsom S, Berk M et al. Investigating the predictive validity of an emergency department mental health triage tool. Nursing & Health Sciences, March 2014
4. Tanner R, Cassidy EM, O’Sullivan I. Does using a Standardized Mental Health Triage Assessment Alter Nurses Assessment of Vignettes of People Presenting with Deliberate Self-Harm. Advances in Emergency Medicine. August 2014

Safety of ambulatory care based management of moderate peri-orbital cellulitis in a tertiary Pediatric emergency department

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Background: Concern about the potential progression of Peri-orbital Cellulitis (POC) often leads to admission for intravenous antibiotics. We developed a guideline to safely manage POC, with daily administration of intravenous (IV) antibiotics in an ambulatory clinic, whilst

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TABLE 1 (Continued)

| Description | Treatment acuity | Typical Presentation | Emergency Department Guidance |
|-------------|-----------------|----------------------|------------------------------|
| 5 No danger to self or others | Non-urgent To be seen within 240 min | Observed Cooperative Communicative and able to engage in developing management plan Able to discuss concerns Compliant with instructions Pre-existing non acute mental health disorder Request for medication Financial, social, accommodation or relationship problems | - Re-triage if evidence of increasing behavioral disturbance - Establish patient’s past medical history - Ensure medical assessment is performed if admission is required Action - Patient to be reviewed by ED medical staff - Medical Social Work referral if appropriate Routine observation** |
avoiding the need for inpatient admission in most patients.

**Objective:** To evaluate the safety of the ambulatory model of care approach for patients diagnosed with moderate POC according to our guideline in the Pediatric emergency department (ED).

**Method:** We audited the progress of all children diagnosed with POC for two years after the introduction of a POC guideline in the Pediatric ED at Children’s hospital at Westmead. We assessed the outcomes and adverse events for patients diagnosed as moderate POC and managed within the ambulatory care model.

**Results:** Of 315 presentations with POC, 88 were categorized as moderate. Ambulatory management for IV antibiotics was initiated in 58 patients discharged from the emergency and a further 4 patients after short admissions (<24 h); 26 patients were admitted for inpatient management. Amongst the 62 (70.5%) managed within ambulatory care model, two developed minor cannula-associated pressure injuries; two patients required cannulas to be re-sited; and two patients required admission due to clinical deterioration, one of whom required ophthalmic surgery. Only one patient (1.6%) of the patients managed on ambulatory basis needed surgical intervention, and none required intensive care or died within 30 days of initial presentation.

**Conclusion:** ED initiated ambulatory care based management can safely avoid inpatient admission for most patients with moderate POC.

**Pilot pathway for improved identification of aortic dissection (AD) at Tallaght university hospital (TUH) emergency department (ED), Dublin, Ireland**

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**Background:** AD is an uncommon cardiovascular emergency that can be difficult to diagnose. Missed diagnosis has catastrophic consequences. A high index of suspicion, prompt diagnosis, and management are imperative to optimize patient outcomes. If recognized, AD can be treated with survival to discharge quoted at 85%–90%. Atypical presentations and lack of awareness contribute to missed diagnosis.

**Objectives:** To improve identification of AD and prevent misdiagnosis in patients presenting to TUH ED by increasing awareness and increasing the volume of diagnostic scans requested and performed within 12 months. Pilot pathway for improving triage (to ‘think’ aorta and include ‘aortic type pain’) and trigger diagnostic imaging earlier and more frequently with collaboration between the ED and Radiology and MDT simulation training.

**Method:** PDSA model as per the Irish Health Service Executive Quality Improvement toolkit with completed audit cycle. Audit of diagnostic scans performed, AD detection rate and missed rate. Review of data and the pathway at 3, 6, and 12 months. Comparison to baseline data.

**Results:** Number of Scans for AD Total: 170, requested by the ED: 149
- Number of Positive Scans: 7
  - 3 Type A dissection
  - 1 Type B dissection

- Number of Missed AD Identified: 0
- Number of Educational Programs (MDT simulations): 3

**Conclusion:** Introduction of this pathway has had a sustained impact on improving patient safety and reducing risk. 4 de novo cases of AD were detected and most importantly there were no missed cases. The culture of ‘thinking aorta’ and performing diagnostic imaging has improved patient care and it is our recommendation that other EDs adopt this pathway.

**Applying human reliability analysis to point of care ultrasound of the abdominal aorta**

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**Background:** Level 1 Point of Care Ultrasound (PoCUS) competency is a requirement for certificate of completion of training in Emergency Medicine. Training and assessing PoCUS skills should be standardized, however, both are variable. PoCUS of the abdominal aorta is performed commonly in Emergency Departments, competency is crucial for patient safety but training is heterogeneous. Standardizing performance in other high risk industries has been achieved by using Human Reliability Analysis (HRA). HRA can be used to identify the steps required to complete a task and potential human errors.

**Methods:** This study utilizes a human reliability analysis framework with three parts; (1) a Hierarchical Task Analysis (2) An Applied Cognitive Task Analysis and (3) a Systematic Human Error Reduction and Prediction Approach (SHERPA). The results of this study were amalgamated to inform and produce a trainer manual to standardize program content and delivery.

**Results:** PoCUS of the abdominal aorta was broken down into 11 principal technical tasks and 26 subtasks. Three major cognitive tasks were identified and analyzed to produce cognitive demands tables and develop two clinical simulation based learning scenarios. 11 potential errors were identified and 54.5% of those errors were deemed ‘high risk’.

**Conclusion:** Human reliability analysis supports clinicians in gaining a comprehensive understanding of how tasks are performed, the technical and cognitive skills required, and the associated risks to improve standardized training and competency assessment. It provides a robust qualitative research methodology for application to PoCUS performance. The standardization of training in PoCUS serves to promote consistency among trainers.
and learners and ultimately to improve patient safety and outcomes.

**Many people admitted to hospital with a provisional diagnosis of nonserious back pain are subsequently found to have serious pathology as the underlying cause**

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**Background:** Understanding the prevalence and profile of patients who were admitted with a provisional diagnosis of non-serious back pain may lead to better understanding of the feasibility of a virtual hospital model care as an alternative to inpatient admission.

**Objective:** To determine the proportion of patients admitted to hospital for back pain, that have non-serious back pain, serious spinal, or serious other pathology as their final diagnosis.

**Methods:** Electronic medical record data between January 2016 and September 2020, from three Emergency Departments (ED) in Sydney, Australia were used to identify inpatient admissions. SNOMED-CT-AU diagnostic codes were used to select ED patients aged 18 and older with an admitting diagnosis related to non-serious back pain. The inpatient discharge diagnosis was determined from the primary ICD-10-AM codes by two independent clinician researchers. Inpatient admissions were then analysed by sociodemographic and hospital admission variables.

**Results:** A total of 38.1% of patients admitted with a provisional diagnosis of non-serious back pain were subsequently diagnosed with a specific pathology likely unsuitable for virtual care; 14.2% with a serious spinal pathology (e.g. fracture, infection) and 23.9% a serious pathology beyond the lumbar spine (e.g. pathological fracture, neoplasm). 57% of admissions were identified as non-serious back pain, likely suitable for virtual care.

**Conclusion:** A challenge for implementing virtual care in this setting is screening for patients with serious pathology. Protocols need to be developed to reduce the risk of patients being admitted to virtual hospital with serious pathology as the cause of their back pain.

**The cardiac output in heart failure (COHF) study**

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**Background:** Acute pulmonary oedema (APO) has significant morbidity and mortality, however there is poor evidence supporting common interventions such as diuretics. We need to investigate such interventions; however, we also need methods giving improved physiological insight rather than rely on traditional physiological observations.

**Objective:** We assessed the impact of non-invasive ventilation (NIV), fluid boluses and diuretic therapy on stroke volume (SV), cardiac output (CO), systemic vascular resistance (SVR), cardiac power (CPO) and delivered oxygen (DO2) in patients complaining of being acutely short of breath.

**Method:** This prospective observational study used haemodynamic data derived from an ultrasonic cardiac output monitor (USCOM), to elucidate the impact of these interventions on core haemodynamic variables, which were also compared on the basis of age, gender, sociodemographic variables, and triage vital signs.

**Results:** CALD patients were significantly older (p = 0.043) and had a longer ED LOS (p = 0.049). Patients administered frusamide had the lowest cardiac output (CO) prior to treatment, however neither frusamide nor NIV had a significant impact on CO in this group. IV fluids engendered a statistically significant increasing trend in CO, SV, CPO, and DO2 and a statistically significant decreasing trend in SVR. Neither NIV nor frusamide showed a clinically significant impact on CO or DO2.

**Conclusion:** Non-invasive, continuous haemodynamic monitoring is potentially useful in optimizing risk-stratification and management of patients with cardiopulmonary compromise. Further investigation using continuous haemodynamic monitoring of the physiological impact of frusamide, NIV, and other interventions in these potentially critically ill patients is necessary.

**Prediction of positive angiography in chest pain patients by analysis of data from the comprehensive emergency dataset for research, innovation and collaboration (CEDRIC)**

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Objective: To examine the associations between patient demography and injury characteristics in a large Emergency Department located in a multicultural region of Sydney.

Method: Data recorded from all injury presentations to Liverpool Hospital Emergency Department during 2018–2019 (n = 28713) were linked retrospectively from existing databases. The influence of Cultural or Linguistic Diversity (CALD) patient status and age on a range of clinically significant measures including mode of arrival, triage category, wait time, length of stay, shock index, hospitalization, length of stay, and discharge disposition were investigated.

Results: Culturally and linguistically diverse (CALD) patients were significantly older than non-CALD, less likely to be male, and experienced longer wait times and lower hospitalization rates in spite of higher hospital mortality. CALD patients were significantly more likely to be discharged to non-critical care rather than home. Results persisted amongst different injury modalities and varied according to age at presentation.

Conclusion: There are significant demographic differences between injury patients of CALD vs. non-CALD background, and evidence that health service utilization is not equitable between these two population groups. ED is an ideal environment for sociodemographic studies, as patients are presenting directly from their communities, preserving potential sociocultural influences surrounding each patient presentation.

Impact of cultural and linguistic diversity on the burden of injury at the extremes of age

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Background: Injury is a major contributor to Australia’s total disease burden, particularly at the extremes of age; however, little Australian research exists into the effect of sociocultural status on injury presentation and outcomes, despite the demonstrated importance of cultural factors in influencing injury risk and health access.

Chest pain in the emergency department; the impact of a novel definition of cultural and linguistic diversity (CALD)

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Title: Chest pain in the Emergency Department; the impact of a novel definition of Cultural and Linguistic Diversity (CALD).

Background: The current definition of CALD is inherent flawed, oversimplifying a diverse population, and particularly ignoring language and its associations.

Objective: To model a novel classification algorithm, using routinely collected variables, to identify population groups more specifically, and to investigate socio-cultural factors impacting emergency care of chest pain.
Method: A 1-year retrospective cohort of patients presenting to ED with chest pain was studied \(n = 7281\), 4414 (61%) CALD and 2867 (39%) non-CALD. CALD patients were subdivided into 2025 (28%) Non-English-Speaking country of birth, Speaking English at home (NESSE), 2172 (30%) Non-English-Speaking country of birth, Not Speaking English at home (NENSE), 217 (3%) Aboriginal and Torres Straits Islanders (ASTI)]. Primary outcomes were ED length of stay (EDLOS), troponin test timing, admission to hospital, and hospital mortality.

Results: Compared to non-CALD, CALD patients had faster troponin ordering times than non-CALD patients, but only NENSE patients experienced longer ED LOS [estimate 19 mins (11, 26), \(p < 0.0001\)], higher admission to hospital [OR 1.5 (1.3, 1.7), \(p < 0.0001\)] and higher hospital mortality [OR 1.7 (1.2, 2.4), \(p = 0.019\)] compared to non-CALD patients.

Conclusion: Adding linguistic elements in a more granular algorithm reveals important differences within the CALD population, supporting the need to develop better descriptions of Australia’s multicultural population.

Epidemiology and geospatial mapping of patients with HYPerglycaemia presenting to Liverpool hospital emergency department–The HYPER study

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Background: Socioeconomically disadvantaged, and culturally and linguistically diverse (CALD) populations, experience a high risk of diabetes and may be less likely to undergo screening. Liverpool ED performs Random Blood Glucose (RBG) tests in standard care, has the highest number of presentations in NSW, and a multicultural and socioeconomically disadvantaged population.

Objective: A retrospective, descriptive study was designed to demonstrate the utility of RBGs and administrative data to identify significant characteristics of patients at risk of diabetes, and predict their spatial distribution. At-risk patients were identified by hyperglycaemia (RBG \(\geq 5.6\)mmol/L), defined by the first RBG result.

Method: Data from ED FirstNet® was linked and analyzed with R Studio. A Generalized Additive Model (GAM) used exploratory variables for multivariate analysis, and were classified as linear or nonlinear predictors.

Results: Among 89,672 presentations, 52,485 patients had an RBG measured; 41,098 patients were classiﬁed as poisoning presentations, representing 1.37% of all ED visits. Most patients were male (54.2%), apart from 0–17-year-old patients who were 60% female. Ages ranged from 0.5 to 92 years old, median 31 (IQR 22.1–43.6). Intentional poisoning cases formed the majority (39.1%) of presentations, followed by recreational poisoning (21.4%), accidental poisoning (31.4%), and envenomation (8.2%). The most notable findings include the predominance of females in intentional poisonings (62.4%) and of males (72.2%) in recreational poisonings. No significant associations were found between CALD status and the type of poisoning.

Conclusion: Identification of poisoning patterns can reveal targets for interventions such as opioid prescribing practices, naloxone self-administration programs, and CALD community outreach programs. Further local studies of poisoning epidemiology are necessary, and we are including these algorithms in a Natural Language Processing machine learning tool.
by ambulance, patient address, increased age and elevated physiological vital signs were associated with hyperglycaemia. These data predicted hyperglycaemic patients with an Area under the Curve (AUC) of 0.72.

Conclusion: Analysis of RBGs and administrative data at Liverpool ED identified characteristics and geographical areas associated with hyperglycaemia. Patients presenting to Liverpool ED from certain regions in South-Western Sydney may experience increased diabetes risk. Future initiatives at Liverpool ED may flag hyperglycaemic male, CALD and older patients for diabetes risk, and test the predictive power of our novel method to identify at-risk communities.

The neutrophil-lymphocyte ratio (NLR) in the assessment of undifferentiated abdominal pain in the emergency department

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Background: The neutrophil-lymphocyte ratio (NLR) is a biomarker thought to correlate with disease severity and has predicted outcome in multiple conditions. In 2017–18, abdominal pain (AP) was the most common presenting complaint in Australian EDs. Accurate assessment remains a challenge, partly due to the broad differential diagnosis, but also to the lack of specificity of associated symptoms. Misdiagnosis and delayed treatment of time-sensitive causes of AP may lead to significant morbidity and mortality.

Objective: We aimed to investigate the utility of NLR in evaluating patients with undifferentiated abdominal pain (AP) within the ED.

Method: A retrospective cohort study was conducted of ED AP patients (n = 16,282). Clinical data were extracted from the electronic medical record and linked; univariate and multivariate analyses were conducted to determine the association between NLR and hospital admission, diagnostic urgency, Intensive Care Unit (ICU) admission and in-hospital mortality; and also, to investigate the predictive power of NLR for hospital admission and diagnostic urgency.

Results: An elevated NLR was significantly associated with hospital admission (p < 0.0001), immediately urgent diagnosis (p < 0.0001), ICU admission (p < 0.0001) and in-hospital mortality (p < 0.0001). In addition, NLR was an independent predictor of hospital admission (Area Under Curve (AUC) = 0.76) and immediately urgent diagnosis (AUC = 0.67).

Conclusion: NLR is a reliable indicator of disease severity in undifferentiated AP and could be an inexpensive, simple tool for assessment and risk-stratification. Further studies should compare the utility of NLR with existing biomarkers, and place NLR in the context of clinical practice, including history, examination, and investigations.

Sensory mats: An observational study to evaluate their use on unsettled behaviors in the emergency department

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Introduction: Sensory, non-pharmacological interventions for dementia and delirium behaviors are increasingly used in care homes and inpatient wards [1–3]. There are few studies available evaluating the utility of such interventions in an Emergency Department [4–6].

Objectives: To determine the utility of sensory stimulation mats in reducing disruptive behaviors in patients in the unsettling environment of an Emergency Department.

Method: In this observational study, ED nursing staff identified eligible patients, principally those showing behaviors such as verbal disruption, intrusiveness, agitation, wandering, or impulsivity. Specific exclusions included physical aggression or age under 10. These patients were given a sensory stimulation mat, a unique handcrafted 30 × 50 cm colorful fabric mat covered in zippers, tassels, and buttons, providing tactile and visual distraction.

Data was collected via feedback forms completed by nursing staff involved in direct patient care. Staff rated the initial level of disruptive behavior before receiving the mat and the subsequent behavior after receiving the mat on a 4 point scale.

Family members, if present, were also encouraged to give qualitative feedback.

Results: 65 mats were distributed with 52 nursing forms returned. 80% of patients showed at least moderate improvement after mat implementation and no patients displayed worsened behaviors.

9 family qualitative feedback forms were also collected.

Conclusion: Sensory stimulation mats may provide a simple, effective intervention for reducing unsettled behaviors of patients in the ED. A follow up study is planned to assess the effect of sensory mats on reducing the use of pharmacological interventions to modify disruptive behavior in this group.

References:
1. Felipe Tomas Martinez, Catalina Tobar, Carlos Ignacio Beddings et al: Preventing delirium in an acute hospital using a non-pharmacological intervention. Age
Are knee x-rays clinically indicated in the emergency department? An audit and comparison of the Ottawa and Pittsburgh knee rules

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Background: The Ottawa Knee Rules (OKRs) and Pittsburgh Knee Rules (PKRs) are clinic decision-making tools used to help determine whether a patient presenting with traumatic knee pain requires diagnostic imaging. The OKRs are better validated, however the PKRs can be used more widely in children and have a better sensitivity.

Objectives: To assess the rate of compliance to the above rules by health professionals at a busy teaching hospital.

Method: A retrospective audit was performed on 53 consecutive knee x-rays of adult patient’s presenting to the Royal Brisbane and Women’s Hospital Department of Emergency Medicine (DEM). Exclusion criteria were applied, leaving 40 patients in the studied data set. Clinical documentation was reviewed to assess the adherence of referrers to the OKRs and PKRs. Data was then analyzed using excel.

Results: 40 patients were included in the study, 31/40 (75.0%) of these met the criteria for diagnostic imaging by OKRs compared to 21/40 (52.5%) for the PKRs. The following findings were detected on imaging: 5/40 (12.5%) had evidence of fracture, 2/40 (5.0%) had evidence of effusion and 30/40 (75.0%) had no abnormalities detected. No notes mentioned the use of OKRs or PKRs.

Conclusions: The OKRs and PKRs are validated and highly sensitive decision making tools which ensure clinical safety while minimizing the quantity of unnecessary imaging. Applying these rules can improve wait times, reduce the burden on radiology services and reduce radiation exposure. Health practitioners should be educated of its use to maintain the recommended 95% adherence rate with the rules.

References:
1. Konan S, Zang TT, Tamimi N, Haddad FS. Can the Ottawa and Pittsburgh rules reduce requests for radiography in patients referred to acute knee clinics? Annals of The Royal College of Surgeons of England. 2013; 95(3): 188–191.
2. Atkinson P, Boyle A, Chisholm E. X-ray requesting patterns before and after introduction of the Ottawa knee rules in a UK emergency department. European Journal of Emergency Medicine 2004; 11: 204–7.
3. Graham ID, Stiell IG, Laupacis A, et al. Awareness and use of the Ottawa ankle and knee rules in 5 countries: can publication alone be enough to change practice? Annals of Emergency Medicine 2001; 37: 259–66.
4. Jalili M, Ghareshaghi H. Validation of the Ottawa knee rule in Iran: a prospective study. Journal of Emergency Medicine 2010; 27: 849–51.
5. Ketelslegers E, Collard X, Vande Berg B, et al. Validation of the Ottawa knee rules in an emergency teaching center. European Radiology 2002; 12: 1218–20.
6. Jenny JY, Boeri C, El Amrani H, et al. Should plain X-rays be routinely performed after blunt knee trauma? A prospective analysis. Journal of Trauma 2005; 58: 1179–82.
7. Seaberg DC, Jackson R. Clinical decision rule for knee radiographs. American Journal of Emergency Medicine 1994; 12: 541–543.

Risk of bleeding of Dabigatran compared to Warfarin in patient with atrial fibrillation

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Introduction: Atrial fibrillation is a common cardiac arrhythmia that is controlled by either rate or rhythm control. Besides, anticoagulants are crucial for managing the condition since patients are at risk of stroke. Novel Oral Anticoagulants are recommended over warfarin if patients are eligible; otherwise, warfarin is the drug of choice. The difference in risk of bleeding between dabigatran and warfarin is not clear.

Objectives: Evaluating the risk of bleeding among patients suffering from atrial fibrillation and receiving dabigatran compared to warfarin.
Method: An electronic search on online databases was conducted. The search involved PubMed, Cochrane library and OVID (Medline). Inclusion and exclusion criteria were applied to decide which articles are included. AMSTAR 2 appraisal tool was used to assess meta-analysis, and systematic reviews included. While the RCT included was assessed using the CASP tool and modified JADAD score.

Results: The search yielded a total of six studies. For primary safety endpoint of major bleeding (i.e., GI bleeding and ICH), studies showed that dabigatran is associated with a lower risk of ICH compared to warfarin. Dabigatran is associated with an overall lower risk of major bleeding. However, GI bleeding was higher in elderly patients compared to younger patients.

Conclusion: Patients receiving dabigatran have lower stroke prevention and have a better safety outcome (i.e. ICH and GI bleeding). Patients receiving dabigatran had a lower risk of ICH. Nonetheless, GI bleeding was a concern for older patients or patients at higher risk of bleeding and receiving dabigatran 150 mg.

An overview and insight into emergency department fellowship trainees’ outlook on e-learning: A positive evolution in the covid era

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Introduction and background: Several restrictions were imposed in Qatar to curtail the covid 19 spread. The Fellowship program in Advanced Physician Leadership in Emergency Medicine of Hamad General Hospital manages weekly didactics on an average of 6 h per week.
We aim to elaborate on the virtual teaching sessions and the trainee outlook to this system. 

**Method:** A survey was conducted on google forms to understand the trainee’s experience on virtual learning. A retrospective review was done on the weekly agenda to access the details of the presentations.

**Results 1:** From May 2020 to June 2021, the program has carried out around 48 live online sessions with over 120 presentations. Faculty delivered sessions included talks on human factors, self-awareness, emotional intelligence, leadership skills, information governance and confidentiality, guidance in academic and reflective writing, resilience in the ED, fellow as educator, professionalism in practice and conflict management.

The trainee delivered sessions included critical appraisals, critical case reflections, mortality and morbidity presentations, quality improvement projects, clinical debates, EBCTR, and EBCA.

**Results 2:** 54.5% preferred blended learning, 36.4% face-to-face learning and 9.1% opted sole virtual learning.

**Conclusion:** This short survey has prompted us to discover more efficient ways of knowledge delivery. The survey reflects a propensity towards blended learning. There is a diverse selection of topics well distributed over the year and well received by the trainees.

**References:**
Qatar Ministry of Public Health Covid -19 protocols and guidelines
C Dong: Tips for medical educators on online teaching in times of social distancing: Sage Journals; (July 2020)
Feldman, B. Is it safe to use Zoom? (May 2020)

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**Evaluation of a co-designed intervention program to improve management of people with borderline personality disorder in emergency departments: A pilot study**

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**Background:** Patients with borderline personality disorder (BPD) frequently present to emergency departments (ED) when experiencing acute crisis. Management of BPD in an ED environment can be challenging for patients, carers, and clinicians alike.

**Objectives:** This pilot study evaluated staff-related outcomes following a collaborative, co-designed intervention to improve the experience of both ED staff and people with BPD who attend the Box Hill Hospital ED. The implementation program involved the development, delivery, and evaluation of a comprehensive package of care, staff training, and patient educational resources.

**Method:** An anonymous online survey of non-mental health specialist ED staff was conducted pre- and post-intervention. The survey assessed knowledge, skills, experience, and attitudes toward BPD.

**Results:** Prior to the intervention, clinician-rated competence (n = 86) was rated as ‘good’ or ‘very good’ in areas of: knowledge about BPD (14%), clinical skills (26.8%) and experience (33.7%). Ratings of positive attitudes towards people with BPD were: willingness (36.4%), optimism (20.8%), enthusiasm (20.8%), and confidence (18.2%). Fifteen matched pre/post pairs were collected; participants exposed to lived experience content showed improvement in domains of knowledge, willingness and optimism (p < 0.05).

**Conclusion:** Specific BPD education was welcomed by ED staff and the pre-intervention survey results confirmed the perception that many staff felt unprepared to work with BPD patients. Low numbers of matched pre-post surveys limited conclusions about change but showed modest improvements among clinicians exposed to lived experience content.

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**A retrospective chart review of documentation of preschool wheeze and acute asthma severity assessment in children attending a Pediatric emergency department**

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**Background:** The severity of preschool wheeze and acute asthma determines clinical management and disposition. Complete documentation should include key clinical parameters and severity classification. However, preschool wheeze and asthma severity documentation is often suboptimal. Unlike established severity classifications, clinical scores provide reliable quantitative data and, in some jurisdictions such as North America, have been successfully integrated into clinical practice and used in treatment algorithms.

**Objectives:** The aim was to assess completeness of documentation of preschool wheeze and asthma severity classification and clinical parameters.

**Method:** A retrospective chart review of consecutive children, triage category 3 to 5 with a discharge diagnosis of preschool wheeze or asthma that presented to the Pediatric Emergency Department between March and April 2021. We assessed medical documentation of clinical parameters and severity classification. We then attempted to apply the Royal Children’s Hospital (RCH) severity...
classification, Pediatric Respiratory Assessment Measures (PRAM) and Pediatric Asthma Score (PAS).

Results: We identified 147 presentations, after exclusion, 100 charts were reviewed. Severity classifications were documented in 23 patients. No asthma scores were documented. Recorded parameters included mental state (100 patients), respiratory rate (98), intercostal retractions (94), activity (93), wheeze (92), air entry (60), oxygen saturation (55), limitation of speech (43), suprasternal retractions (49) and scalene muscle contraction (0). Parameters were adequate to complete RCH assessment in 43 patients, PAS (22) and no PRAM presentations.

Conclusion: We identified suboptimal levels of complete documentation. Clinicians infrequently documented severity classification or adequate parameters to accurately complete severity scores.

The HINTS examination and STANDING algorithm in acute vestibular syndrome: A systematic review and meta-analysis involving frontline point-of-care emergency physicians

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Introduction: This systematic review aims to evaluate whether point-of-care emergency physicians, without special equipment, can perform the HINTS examination or STANDING algorithm to differentiate between central and non-central vertigo in acute vestibular syndrome with diagnostic accuracy and reliability comparable to more specialized physicians (neuro-ophthalmologists and neuro-otologists). Previous research has concluded that emergency physicians are unable to utilize the HINTS examination with sufficient accuracy, without providing any appropriate education or training.

Description: A comprehensive systematic search was performed using MEDLINE, Embase, the Cochrane CENTRAL register of controlled trials, Web of Science Core Collection, Scopus, Google Scholar, the World Health Organization International Clinical Trials Registry Platform, and conference programs and abstracts from six medical organizations. Of the 1,757 results, only 21 were eligible for full-text screening. Two further studies were identified by a manual search of references and an electronic search for any missed studies associated with the authors.

Outcomes: Five studies were included in the qualitative synthesis. For the STANDING algorithm, there were two studies of 450 patients who were examined by 11 emergency physicians. Our meta-analysis showed that emergency physicians who had received prior education and training were able to utilize the STANDING algorithm with a sensitivity of 0.96 (95% confidence interval: 0.87–1.00) and a specificity of 0.88 (0.85–0.91). No data was available for the HINTS examination.

Conclusions: When emergency physicians are educated and trained, they can use the STANDING algorithm with confidence. There is a lack of evidence regarding the HINTS examination; however, two ongoing studies seek to remedy this deficit.

Assessment of emergency trauma triage and appropriate departmental response in a district general hospital

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Background: Patients that experience severe injury from trauma have a greater survival rate if fully assessed by a dedicated trauma team. Undertriage of trauma patients leads to increased morbidity and mortality. Patients at risk should be identified through the “Triage Trauma Team Notification Criteria,” on our trauma (MR1) form. The patient should be triaged as either an ATS score 1 or 2, a senior informed, imaging organized or transfer to the regional trauma center.

Objectives: Was the trauma activation criteria completed and senior doctor informed by triage on the MR1 form? Was there a correlation between ATS, location of review, time to medical review and Injury severity score (ISS)?

Method: The audit was conducted as a descriptive cross sectional survey, identifying the first 50 patients that fulfilled the trauma activation criteria. A search report was generated using EDIS (Emergency Department Information System).

Results: The median ISS of the patients was 18 suggesting that the average level of trauma was considered serious or life threatening. 34% of patients had an ISS of 15 or higher fitting into the category of life threatening injury. 51% of these patients arrived by private transport and a delayed time for medical review.

Conclusion: Non-compliance with the MR1 form and therefore not identifying at risk patients. Review of the trauma patient in an appropriate resuscitation setting –as this prompted early review by a senior doctor. Approximately half the patients ‘walked-in’ so altering the mindset of the triage team when considering major trauma.

Intersectionality and wait times audit at a metropolitan general hospital emergency department

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Background: There exists a gap within our organization of equity, diversity and inclusivity (EDI) knowledge and
education. Developing cultural competency has been recognized as a key priority in the Sustainable Health Review. The key is to reduce micro aggressions and discrimination through our unconscious bias.

**Objectives:** The aim was to address equity of wait times of minority and marginalized backgrounds at a General Hospital (RGH) Emergency Department (ED) for the same triage categories?

**Method:** Emergency Department Information System (EDIS) Data collected of ED presentations over 1 year 60,697 patients recruited PivotTable analysis Data included Aboriginal and Torres Strait Islander (ATSI) people, gender and presenting complaint (mental health (MH) versus non-MH conditions).

**Results:** 4.8% presentations were ATSI patients. 6.2% represented true MH patients Triage category 1 and 2 patients were generally the same times to be seen in all groups with no statistical difference. Longest wait time for low acuity cases were patients with both ATSI and MH conditions (96.9 min average for categories 3,4 or 5, compared to 70.91 min for non MH ATSI patients) Indigenous females with MH presentations had a longer wait than their male counterparts (74.39 min compared to 68.28 min).

**Conclusion:** Longer wait times seen in marginalized groups, most notably those presenting with both ATSI and mental health issues. The audit hasn’t addressed if correctly triaged or whether the unconscious bias affects triaging. Suggest a blinded study in the future.

Systemic bias is multi layered and requires education and a review of processes to overcome these.

**Unexpected guest stole my attention: Renal colic due to renal infarction**

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**Introduction:** Renal infarction is a rare condition that usually occurs in patients with severe atherosclerosis, heart disease or associated with autoimmune diseases.¹,² Hypercoagulable state can contribute to vascular occlusions. The presentation of renal infarction is usually confused with nephrolithiasis and pyelonephritis, and the diagnosis is often delayed or missed.¹³

**Description:** We describe a case of a 54-year-old male patient with a history of atherosclerosis and ischaemic heart disease who presented with sudden onset right flank pain associated with nausea and vomiting. Renal contrast-enhanced CT (CECT) demonstrated multiple non-enhancing areas noted in the right kidney with obliteration of the renal artery branches and intraluminal thrombus in the anterior branch of the right renal artery.

(Figure 2), compared to normal findings in non-contrast CT (Figure 1)

**Outcomes:** The patient had input from the vascular surgeons, and no surgical intervention was needed. He was placed on heparin infusion, he has improved clinically, and renal function came back to normal. The patient was discharged on warfarin with daily check till achieve the therapeutic range (2–3), He was also for Vascular Surgery outpatient follow up.

**Conclusions:** Renal infarction is an easily missed diagnosis due to its nonspecific presentation. Sudden onset of
abdominal pain with nausea and vomiting in a patient with a history of atherosclerosis or heart disease should raise high suspicion for renal infarction. In the case of normal abdominal CT without contrast with the presence of elevated lactate dehydrogenase, Renal CECT is highly recommended for detecting renal infarction.

References:
1. Goldberg G. Renal infarction. Ann Emerg Med 1985;14(6):611–4.
2. Braun DR, Sawczuk IS, Axelrod SA. Idio-pathic renal infarction. Urology 1995;5:142–5
3. Bourgault M, Grimbert P, Verret C, Clin J Am Soc Nephrol. 2013 Mar;8(3):392–8. Epub 2012 Nov 30

‘EVESTA’: Demystifying acute dizziness within the emergency department

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Background: Differential diagnosis of acute dizziness is a complex task within the emergency department (ED), serious pathology may be apparent or quite obscure1. Evidence based practice in the diagnosis and treatment of peripheral dizziness is seldom implemented in the ED once central causation is ruled out2.

Objective: To synthesize evidence based research concerning the assessment and management of acute dizziness via construction of a clinical algorithm. Assess its impact on clinical practice within Wyong Emergency Department (ED).

Method: Current best practice models of care1–8 were synthesized into a single clinical, locally peer reviewed pathway – “EVESTA- Emergency VESTibular Algorithm”. A pre and post implementation study was then completed which focused on the diagnosis of Benign Paroxysmal Positional Vertigo (BPPV). A total of 162 notes (pre n = 87 and post n = 75) met the inclusion criteria. Adherence to the clinical practice guidelines3 statement 1a, 3a, 4a and 6 were analyzed for statistical difference in practice.

Results: Following implementation of ‘EVESTA’ compliance showed a significant improvement in Hallpike-Dix performed by 27% [95%CI (14–40%); defects pre-intervention 40%; post-intervention 13%; (p < 0.001), utilization of neuroimaging reduced by 16% [95%CI (2–30%); 40%;24%] (p < 0.05), CRT performed 33% [95%CI (18–48%); 68%;36%] (p < 0.001). Administration of vestibular suppressant medication reduced by 37% [95%CI (23–52%); 66%;29%] (p < 0.001).

Conclusion: Diagnosis and management of acute dizziness is challenging within the ED. Synthesis of best practice into a clinical algorithm has improved the diagnosis of peripheral dizziness. There is continued opportunity to improve effectiveness in the management of both central and peripheral acute dizziness within the ED.

References:
1. Newman-Toker DE & Edlow JA. TiTrATE: A novel approach to diagnosing acute dizziness and vertigo. Neurology Clinical, 2015; 33(3): 577–599.
2. Bhattacharyya N, Gubbels SP, Schwartz SR, et al. Clinical practice guideline: benign paroxysmal positional vertigo (update). Otolaryngology Head Neck Surgery. 2017; 156(3.Suppl):S1-S47.
3. Kerber KA, Burke JF, Skolarus LE, Meurer WJ et al. Use of BPPV Processes in Emergency Department Dizziness Presentations: A Population-Based Study. Otolaryngology—Head and Neck Surgery. 2013; 148(3): 425–430. https://doi.org/10.1177/0194599812471633
4. Eagles D, Stiell IG, Clement CM, Brehaut J, Kelly AM, Mason S, Kellermann A, Perry JJ. International survey of emergency physicians’ priorities for clinical decision rules. Acad Emerg Med. 2008 Feb;15 (2):177–82. doi: 10.1111/j.1553-2712.2008.00035.x. PMID: 18275448.
5. Cheung CSK, Mak PSK, Manley KV, Lam JMY, Tsang AYL, Chan HMS, Rainer TH & Graham CA. Predictors of important neurological causes of dizziness among patients presenting to the emergency department. Emergency Medical Journal. 2010; 27: 517–521. doi:10.1136/embr.2009.078014.
6. Ahsan SF, Syamal MN, Yaremchuk K, Peterson E, & Seidman M. The costs and utility of imaging in evaluating dizzy patients in the emergency room. Laryngoscope, 2013; 123(9): 2250–2253. https://doi.org/10.1002/lary.23798
7. Gurley KL, Edlow JA. Acute Dizziness. Semin Neurol. 2019 Feb;39(1):27–40. doi: 10.1055/s-0038-1676857. Epub 2019 Feb 11. PMID: 30743290. Edlow JA. Diagnosing dizziness: we are teaching the wrong paradigm! Acad Emerg Med. 2013 Oct;20 (10):1064–6. doi: 10.1111/acem.12234. PMID: 24127712.

Analyzing the disparities in the quality of pre-hospital trauma care between rural and urban areas

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Background: Globally there are approximately 5.8 million injury-related deaths per year1,2, with the largest proportion of deaths from traumatic injury occurring during the pre-hospital interval3. Disparities exist in the quality of pre-hospital trauma care delivered by emergency medical services (EMS), particularly in relation to urban versus rural trauma injury mortality rates.

Objectives: We aim to explore the factors that limit the timely and effective provision of pre-hospital care across
the globe, and help to explain urban-rural variances in trauma injury mortality rates.

**Method:** A PubMed-wide literature review was conducted using the search term “rural versus urban pre-hospital care”. A systematic review conducted by Alanazy A. et al. provided the foundation upon which the majority of reports relevant to my study were located.

**Results:** In high-income countries urban EMS are generally associated with the delivery of higher quality pre-hospital trauma care compared to rural EMS. Urban areas experience faster response-, on-scene- and hospital trauma care compared to rural EMS. Urban areas are typically associated with the delivery of higher quality pre-hospital mortality rates and increased survival for urban trauma patients compared to their rural counterparts.

**Conclusion:** While it is not economically viable to have specialist care in every rural area, data gathered can be used to map trauma service requirements against provision. Further studies in low and middle income countries may be able to uncover larger disparities in the quality of pre-hospital trauma care in these areas. Finally, future studies could re-analyze data to conform to one definition of what exactly classifies as an urban/rural population.

**References:**
1. Injuries and violence: the facts. Geneva, World Health Organization, 2010.
2. Gosselin R. Injuries: the neglected burden in developing countries. Bulletin of the World Health Organization. 2009;87(4):246–246.
3. Jarman M, Hashmi Z, Zerhouni Y, Udyavar R, Newgard C, Salim A et al. Quantifying geographic barriers to trauma care. Journal of Trauma and Acute Care Surgery. 2019;87(1):173–180.
4. Alanazy A, Wark S, Fraser J, Nagle A. Factors Impacting Patient Outcomes Associated with Use of Emergency Medical Services Operating in Urban Versus Rural Areas: A Systematic Review. International Journal of Environmental Research and Public Health. 2019;16(10):1728.
5. Grossman D.C., Kim A., Macdonald S.C., Klein P., Copass M.K., Maier R.V. Urban-rural differences in pre-hospital care of major trauma. J. Trauma. 1997;42:723–729. doi: 10.1097/00005373-199704000-00024
6. Gonzalez R.P., Cummings G.R., Phelan H.A., Mulckar M.S., Rodning C.B. Does increased emergency medical services prehospital time affect patient mortality in rural motor vehicle crashes? A statewide analysis. Am. J. Surg. 2009;197:30–34. doi: 10.1016/j.amjsurg.2007.11.018.

**Collecting validity evidence of the Japanese version of medical emotions scale in pediatric emergency medicine postgraduate training**

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**Background:** Emotion research is a burgeoning field in medical education. The medical Emotion Scale (MES) and the Japanese version of MES (J-MES) have been developed to measure the emotions of medical trainees; however, validity evidence of the scales in postgraduate medical education is limited.

**Objectives:** This study aims to add the validity evidence of the J-MES in the context of postgraduate clinical reasoning education in pediatric emergency medicine.

**Method:** Seventy-five postgraduate trainees of pediatric emergency medicine completed J-MES before, during, and after solving the Japanese version of the Pediatric Emergency Medicine Script Concordance Test (Jpem-SCT). We conducted three exploratory factor analyzes (EFAs) to examine the factor structure of the J-MES using the scores for each time point. We also performed a series of simultaneous multiple regression analyzes to predict self-efficacy and the Jpem-SCT scores separately based on the assessed emotions, perceived control, and task value.

**Results:** Cronbach’s alpha coefficients as a measure of internal consistencies of the J-MES measured before, during, and after the task were .80, .78, and .83, respectively. Our results from the EFAs showed that three factors were extracted: positive emotions (e.g., happiness, curiosity), negative self-agency emotions (e.g., anxiety, shame), and negative situation-agency emotions (e.g., boredom, frustration). While the self-efficacy was a significant predictor in our multiple regression model, the Jpem-SCT score was not a statistically significant predictor.

**Conclusion:** The profiles and the internal structure of the J-MES scale were consistent with emotion theory in the context of postgraduate pediatric emergency medicine education.

**References:**
1. Nomura, O., Ito, T., Mori, T., Ihara, T., Tsuji, S., Inoue, N., & Carrière, B. (2021). Creating Clinical Reasoning Assessment Tools in Different Languages: Adaptation of the Pediatric Emergency Medicine
Central venous catheter as alternative device for massive pericardial and pleural effusion in emergency department

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In a resource limited center, most often alternative options are necessary to overcome the challenges of emergency devices. Massive pericardial effusion and pleural effusion are few examples that often present to emergency department which compromises respiration and hemodynamics. Therefore, urgent decompressions are necessary to stabilize such cases immediately. We have utilized triple lumen central venous line catheter as a method to achieve primarily hemodynamics stabilization, thoracic decompression and additionally provide the advantage of controlled continuous drainage of fluids. We conducted a retrospective study to evaluate primarily effectiveness and secondary objective to investigate for complications related to the procedure. Total six cases were obtained, of which two cases were cardiac tamponade and four cases were massive pleural effusion. No reported complications of pneumothorax, hemothorax or re-expansion pulmonary edema. The use of central venous catheter is effective to offer emergency decompression in emergency department as well as slow continuous drainage for in-patient care.

Keyword: Pericardial Effusion, Pleural Effusion, Central Venous Catheter

Johor disaster medical response vehicle (JDMRV) team response to selangor flood disaster amidst COVID-19 pandemic

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Introduction: Flood disasters have taken place worldwide even under COVID-19 pandemic. Poorly planned emergency response would risk the spreading of COVID-19 and increase disaster damage, leading to further human losses and health-economic damage.1,2

Objectives: Evaluate the management of flood disaster during COVID-19 pandemic, identify measures to be incorporated in disaster protocols and preparedness trainings for emergency medical services (EMS).

Description: On 16 December 2021, several states in Malaysia were hit with a flash flood overwhelming EMS provision and access. Following the flood disaster, JDMRV team from Hospital Sultan Ismail has responded to the flood disaster activation, as appointed by JKNJ, for Taman Sri Muda and Banting, Selangor.

Outcomes: COVID-19 preventative measures were suggested while ensuring optimisation of disaster management. EMS providers need to ensure safety of the disaster management staff and volunteers, including application of Personal Protective Equipment (PPE), identifying vulnerable groups to COVID-19 such as the elderly and informal settlers who lived in a densely populated demographic area especially seen in Taman Sri Muda, actively promoting water and sanitation hygiene, WASH concept, advocated by WHO and social distancing among local communities and involvement of local Public Health Officers to assist in controlling the spread of COVID-19 infections.

Conclusion: A revision of current local protocol for dual disasters management during COVID-19 Pandemic is essential. Integration of the revised protocols into localized institutional disaster training in order to ensure the adequacy of knowledge, attitude and practices of emergency medical personnel towards complexity of dual disasters endeavors.

References:
1. Mikio I, Toshio K, Kenzo H, Takao T, Tsukasa K. Managing disasters amid COVID-19 pandemic: Approaches of response to flood disasters [April 2020] The University of Tokyo, Japan https://doi.org/10.1186/j.pdisas.2020.100096
2. Sanaz S, Shiva Y, Amirhosein B, Mohammad HV. A systematic review of health sector responses to the coincidence of disasters and COVID-19 [13th April 2021] BMC Public Health (2021) 21:709 https://doi.org/10.1186/s12889-021-10806-9
3. WHO. Water, sanitation, hygiene, and waste management for the COVID-19 virus [Internet]. 29th July 2020 (accessed on 26th Jan 2022). Available from https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC-WASH-2020.4

Taman Sri Muda is a town under Shah Alam district consisting terrace houses and apartments with higher population density, meanwhile Banting is an agricultural hub under the Kuala Langat district which is situated on the banks of Sungai Langat. A medical base was set up at each area, on 23 December 2021 and 24 December 2021, respectively.

The challenges faced by EMR team were access to location of the affected area due to the flood and only accessible by bigger vehicle equivalent to JDMRV, identifying suitable area for medical base set up, unpredictable weather, limited access to safe drinking water and sanitation, prolonged shift, human resources, communication network restriction and most significantly maintaining the standard operation protocols in order to restrict the spread of COVID-19 and at the same time making sure efficient EMS are delivered for the flood victims.
Emergency Medicine (TAAAC-EM), 6Knowledge Translation Program, Li Ka Shing Knowledge Institute, St Michael’s Hospital, Toronto, Canada, 2Department of Emergency Medicine, Addis Ababa University, Addis Ababa, Ethiopia, 3Ontario Poison Center, Toronto, Canada, 4Toronto Addis Academic Collaboration in Emergency Medicine (TAAAC-EM), 5Knowledge Translation Program, Li Ka Shing Knowledge Institute, St Michael’s Hospital, Toronto, Canada

Introduction: The Toronto Addis Ababa Academic Collaboration (TAAAC) in Emergency Medicine (EM) is a bi-institutional partnership between the University of Toronto (UofT) and Addis Ababa University (AAU) focused on addressing the need for EM postgraduate training and care in Ethiopia.

Toxicology is a key competency in EM. EM physicians are often the first and sole clinicians to identify and treat patients presenting with a wide range of intoxications. The goal of this project was to conduct an educational needs assessment to inform development of a context-specific toxicology curriculum for the AAU EM training program.

Description: Our needs assessment consisted of a survey and face-to-face interviews conducted with Ethiopian EM faculty (all graduates of the AAU EM residency training program) and current AAU EM residents. The survey was distributed in October 2018 and the interviews conducted in November 2018.

Outcomes: Of 63 surveys distributed, we received 17 complete responses and completed 11 interviews with AAU EM faculty and residents. Both the survey and thematic analysis of interview data suggested the main issues are lack of resources such as medication, antidotes, equipment, and personal protective PPE. Participants emphasized the need to address local toxins, and for context-specific training, especially managing with locally available resources.

Patient-related themes revealed some novel desires of integration with public health and industry to improve patient education in handling toxic substances and medication.

Conclusions: Educational training in toxicology is well-received, however, additional coverage of common local toxicological presentations as well as practical issues in ED management of toxicological presentations is needed.

Reference: N/A

The addis ababa toxicology curriculum project: educational needs assessment for the toxicology modules of an emergency medicine training program

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Reference: N/A

Evaluating functional status post-injury in patients presenting for emergency care in Kigali, Rwanda

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Background: Despite high injury-related morbidity, functional status after presenting for emergency care remains poorly characterized in resource-limited settings.

Objectives: This study evaluated the feasibility of using a standardized disability assessment tool among injured patients presenting for care to a tertiary emergency department (ED) in Kigali, Rwanda.

Methods: This was an a priori secondary analysis of data from a prospective cohort study of injured patients presenting with significant trauma during January to June 2020 at the ED of Center Hospitalier Universitaire de Kigali. Functional status at 28-days post-injury was assessed using the World Health Organization Disability Assessment Scale 2.0 (WHODAS-2) as well as self-reported functional state. Descriptive analyzes were performed and comparisons conducted with t-test and chi-square.

Results: Twenty-four patients were sampled, of which 87.5% were male. The most common injury mechanism was road traffic accidents (70.8%). Head/face injuries were the most common injured body region (75%), with 58.3% having traumatic brain injury. 25% remained hospitalized 28-days post-injury. No patients had baseline disabilities pre-injury. Among discharged patients, the median WHODAS-2 score was 16 (IQR: 9–24). At 28-days post-injury, 75% reported inability to get out of bed without assistance. Nearly all (88.9%) patients self-
Impact of COVID-19 pandemic on neurotrauma epidemiology and management at a Rwandan tertiary hospital

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Background: National regulations to curb COVID-19 transmission and healthcare resource reallocation may have impacted treatment for neurotrauma, including traumatic brain injury (TBI) and spinal cord injury (SCI), but these trends have not been characterized in Sub-Saharan Africa.
Objectives: To analyze differences in epidemiology, management, and outcomes preceding and during the COVID-19 pandemic for neurotrauma patients at the Center Hospitalier Universitaire de Kigali (CHUK), Rwanda’s national referral hospital.
Method: Adult injury patients presenting to the CHUK Emergency Department were prospectively enrolled from 1/27/20–6/28/20. Study personnel collected data on demographics, injury characteristics, treatment, and outcomes. Chi-squared and Mann-Whitney tests assessed differences in patients before (1/27/20–3/22/20) and during (6/1/20–6/28/20) the COVID-19 pandemic.
Results: This study analyzed 216 neurotrauma patients at CHUK (83.8% with TBI, 8.3% with SCI, 7.9% with both). Weekly volumes for TBI (mean = 16.5 vs. 17.1, P = 0.82) and SCI (mean = 2.0 vs. 3.4, P = 0.09) did not change between study periods. Patients during the pandemic had lower GCS (mean = 13.8 vs. 14.3, P = 0.07) and Kampala Trauma Scores (mean = 14.0 vs. 14.3, P = 0.09) at admission, denoting higher injury severity, approaching significance. Hospitalization rates (54.6% vs. 39.9%, P = 0.04) increased significantly during COVID-19. Patients treated during this period also had higher rates of abnormal CT findings (47.1% vs. 26.7%, P = 0.003) and neurologic decline (20.0% vs. 10.3%, P = 0.04). Moreover, craniotomy rates doubled (25.7% vs. 13.7%, P = 0.003). However, mortality (5.5% vs. 5.7%, P = 0.94) was unchanged.
Conclusion: Neurotrauma volume did not change significantly at CHUK during the COVID-19 pandemic, but patients had higher injury severity and craniotomy rates.

Evidence into practice–Improving neonatal pain and discomfort in the emergency department

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**Introduction:** The aim of this project was to improve the management of neonatal pain and discomfort in an Pediatric Emergency Department. Anecdotal feedback, a lack of guidelines and educational material and direct observation by ED nurses suggested that neonates undergoing painful or distressing procedures in the ED were not receiving optimal care.

**Description:** A literature review was undertaken and identified key areas where clear evidence for simple interventions existed. These interventions included: sucrose, non-nutritive sucking, wrapping/swaddling, skin to skin / kangaroo care, positioning / facilitated tucking and music therapy. From a patient /family experience perspective interventions included providing parent education and encouraging parental involvement in non-invasive pain relief.

**Outcomes:** A pre intervention staff survey helped guide the content of the education package by identifying current attitudes and behaviors. An education package for staff was then designed and implemented. A new SCHN/HNEkidshealth factsheet was produced for staff and parent education. The survey was repeated post intervention. The pre intervention survey had 79 responses and the post intervention 46 responses. Respondents felt that the new interventions improved the management of neonatal pain, increased the use of non-pharmacological techniques, and increased the presence of parents in the procedure room.

**Conclusions:** The project has been a success and is summarized by: “Sweat the small stuff - The three ‘S’ on neonatal pain relief: sucrose, swaddle and skin to skin”. The factsheet is available at https://www.schn.health.nsw.gov.au/files/factsheets/comforting_your_baby_during_painful_procedures-en.pdf

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**Growth in emergency department self-harm or suicidal ideation presentations in young people: Comparing trends before and since the COVID-19 first wave in New South Wales, Australia**

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**Background:** Self-harm presentations in children and young people have increased internationally over the last decade. The COVID-19 pandemic has the potential to worsen these trends.

**Objectives:** To describe trends in Emergency Department (ED) self-harm or suicidal ideation presentations for children and young people in New South Wales (NSW) before and since the COVID-19 pandemic.

**Method:** We studied presentations for self-harm or suicidal ideation by 10–24 year-olds to NSW EDs, using interrupted time series analysis to compare annualized growth before COVID (2015 to February 2020) and since (March 2020-June 2021). Subgroup analyzes compared age-group, gender, triage category, rurality, and disadvantage. Time series decomposition via generalized additive models identified long-term, seasonal, and short-term trends.

**Results:** Self-harm or suicidal ideation presentations increased by 8.9% per annum (pa) pre-COVID. Growth accelerated post-COVID, to 19.9 % pa, primarily due to increased presentations by females aged 13–17 (up 47.1% pa, from 290 per 10,000 in 2019 to 466 per 10,000 in 2021). Presentations in males aged 10–24 did not increase post-COVID (105.4 per 10,000 in 2019, 109.8 per 10,000 in 2021) despite growing 9.9% pa before COVID. Presentation rates accelerated significantly in socially advantaged areas and in non-aboriginal youth. Presentations in children aged under 18 were strongly linked to school semesters.

**Conclusion:** ED self-harm or suicidal ideation presentations by NSW young people grew steadily before COVID. Growth has increased since COVID particularly for adolescent girls. The largest post-COVID increases occurred in socio-economically advantaged and urban regions and non-Aboriginal young people.

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**Improving the clinical reasoning and clinical skills of non-emergency trainees working in a tertiary Pediatric emergency department: The simulated emergencies and clinical skills in infants and children (SEACSIC) course**

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**Introduction:** Pediatric Emergency Departments (PEDs) often have rotations of non-emergency trainees. Local Morbidity and Mortality data demonstrated adverse outcomes for patients as trainees were unfamiliar with common clinical skills and had less experience at managing Pediatric emergencies.

**Description:** A one day, paid, free simulation course was developed and all Royal Australasian College of Physicians (RACP) trainees were rostered to attend in the first weeks of term. The course was developed with input
from RACP trainees and faculty and followed several PDSA cycles to ensure it met the needs of trainees and the department. The course focused on clinical skill acquisition using flipped classroom techniques and hands on skill practice in peripheral ultrasound guided cannulation, lumbar puncture, and intrasosseous insertion. For clinical reasoning low fidelity simulation was used with an emphasis on uncommon, but important presentations such as SVT and life threatening asthma. Additional sessions involved advanced life support (RESUS4KIDS) and recognition of the deteriorating patient (DETECT Jnr). Courses were evaluated by post course surveys using a mixed methods approach.

Outcomes: Twelve courses occurred between August 2020 and December 2021, attended by 94 RACP trainees. 68 trainees responded to the post course survey. All sections of the course received positive feedback. 100% of respondents rated the course very or extremely beneficial to their professional development. Common themes across sessions included new knowledge, new skills, skill practice, development of clinical reasoning and appreciation for the experience.

Conclusions: The SEACSIC course is a valuable educational experience for non-ED doctors starting in the PED.

COVID toes

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Introduction: COVID toes are still an unfamiliar entity among many. These painful reddish-purple discolorations of the toes which give an acro-ischaemic appearance are easily confused with other common conditions such as Raynaud’s disease, peripheral arterial diseases, or chilblains.

Description: We present a case study of a 46-year-old, Chinese Malaysian Male, who presented with periungual purplish discolorations of his right third to fifth toes. He also reported that he had a history of COVID-19 infection 7 weeks prior where he had exhibited only mild symptoms. Physical examination revealed that there was a purplish-black discoloration at the periungual regions of the 3rd to 5th toes which extends to the plantar surface of the toes but sparing the tip of the toes. The characteristic pattern of discoloration of the toes with his history of COVID-19 infection led to the diagnosis of COVID toes.

Outcome: The skin biopsy of the affected site showed perivascular lymphocytic infiltration which is suggestive of the diagnosis of COVID toes. An autoimmune screening was done which came back negative. His Covid antibody showed IgG positive while the Covid IgM was negative.

Conclusions: Since the start of the COVID-19 pandemic, our knowledge regarding the disease and its various manifestations are ever-growing. Such as with COVID toes, healthcare personnel everywhere should be aware that we may start to see a variety of cutaneous manifestations of COVID-19 in the time to come.

'Sphere in a sphere': Headache a common presentation of intracranial neoplasm

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Introduction: Headache is a common presenting complaint to emergency department; it can be benign or malignant. Identifying the red flag sign in emergency department is crucial to determine underlying pathology and subsequent management.
Objectives: Headache is a common presentation of intracranial neoplasm, it is crucial to identify in emergency department.

Description: We report a case of 61 years old lady presented with unilateral, throbbing headache and dizziness for 2 weeks. She had dysmetria and dysdiadochokinesia. Contrasted CT brain reveals ill-defined hypo dense lesion over the left parietal region measuring 5 x 3.6cm. Further investigation done to identify primary tumor and patient was treated on steroids, prophylaxis anti-epileptic and referral to neurosurgeon.

Outcome: Headache is 4th most common presentation to emergency department, approximately 3% of total cases. Identifying red flag sign by onset of symptoms, headache quality, past history and other associated symptoms together with neurological examination will lead to a diagnosis which can be supported by imaging studies such as CT brain or MRI. Primary cause such as tension, cluster headache, and migraine are mostly benign and can be treated in emergency department with outpatient follow up, meanwhile secondary causes such as intracranial neoplasm, infection or stroke needs immediate appropriate intervention.

Conclusion: Headache can be primary or secondary. It is crucial to identify red flag sign of headache and secondary headache which strongly indicated for CT or MRI and commonly associated with intracranial pathology such as intracranial neoplasm.

Developing departmental psychological safety through debriefing

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Background: It is not unusual for Emergency Department (ED) staff to be exposed to a wide spectrum of stressful events through exposure to patients experiencing trauma on an everyday basis.1 The continued exposure to patients in crisis has significant probability to produce negative outcomes for healthcare staff without appropriate care and support.2

Description: The acute incident response (AIR) program3 was implemented in Wyong Hospital ED to help timely and appropriate responses to events that may signify potential psychological harm to staff in the ED. A pre-implementation survey3 was carried out in the ED attempting to identify the current support structures available. A post AIR program implementation survey was completed 6 months later.

Results: Participation in a formal debrief following an acute event doubled to 49% of respondents. Perception of available support showed similar improvements. Those reporting either very easy or easy access to support increased by 20%. Those who did not feel comfortable asking for help fell by 42% whilst those who believed they possessed the knowledge and skills to provide support to a colleague after an acute incident increased by 44%.

Conclusion: The AIR program achieved improvements in staff accessing psychological support, perception of available support and enhanced perception of their ability to provide support to colleagues. These results were achieved over just 6 months at no financial cost. The barriers to creating a culture of psychological safety are lower than perhaps expected and should encourage the establishment of such projects in other EDs.

References:
1. DeLucia J.A. Bitter C. Fitzgerald J. Greenberg M. Dalwari P. Buchanan P. Prevalence of post-traumatic stress disorder in emergency physicians in the United States. West J Emerg Med. 2019; 20: 740–746
2. Driaenssens J. De Gucht V. Van Der Doef M. Maes S. Exploring the burden of emergency care: predictors of stress-health outcomes in emergency nurses. J Adv Nurs. 2011; 67: 1317–1328
3. Pallas J. The Acute Incident Response Program: A Framework Guiding Multidisciplinary Responses to Acutely Traumatic or Stress-Inducing Incidents in the ED Setting. J Emerg Nurs. 2020 Sep;46(5):579–589.e1.

Migration of orbital silicone oil into subarachnoid and cerebral ventricular spaces

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Background: Silicone oil orbital injections are used in the treatment of complex retinal detachments, traumatic injuries, and diabetic retinopathy. A rare complication of silicone injection is the extravasation of silicone oil into the intracranial space.

Objectives: To understand how intraorbital silicone oil can migrate intracranially.

Method/Description: This is a single patient chart review. A 55-year-old man with a history of left eye diabetic retinopathy previously treated with intra-orbital silicone injection presented to the Emergency Department after a fall. Vital signs were notable for a blood pressure of 185/88 mmHg. Physical exam was pertinent for a sclerotic-appearing left eye and an unsteady gait. Serum laboratory studies were unremarkable. Computed tomography (CT) scan of his head showed high density material consistent with silicone oil in the subarachnoid space and lateral ventricles. A CT scan 13 days prior did not show this finding.

Results/Outcomes: The patient was admitted by neurology. Ophthalmology was consulted, who recommended outpatient follow up. The patient was ultimately transferred to a rehabilitation center.

Conclusion: Intra-orbital silicone injection is used to create a retinal tamponade for conditions such as severe proliferative diabetic retinopathy or retinal detachment to promote retinal reattachment and preserve visual acuity1,3,10. Silicone oil may migrate through the optic nerve into the subarachnoid space and cerebral ventricles2,4–9. Adverse effects are unknown, though the...
ABSTRACT

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Background: Brugada syndrome is sodium channelopathy that can cause sudden cardiac death1-3. This disorder is inheritable, or can also be unmasked in patients via drugs, myocardial ischemia, or fever. Its association with the novel SARS-COV2 virus is unclear. Objectives: To understand how Brugada syndrome can present in a pediatric patient afflicted with COVID-19

Method/Description: This is a single patient chart review.

A 6yo male presented to the pediatric emergency department for fever, abdominal pain, emesis, and headache. He was found to be febrile, tachycardic, and tachypneic. The patient tested positive on a rapid COVID-19 test. An electrocardiogram (EKG) was obtained that showed a Brugada pattern. He had no previous EKG on record.

Results/Outcomes: The patient was transferred to a tertiary pediatric facility where an echocardiogram was performed concerning for mildly depressed cardiac function and a dilated left coronary artery. After 48 h, his repeat EKG showed normal sinus rhythm with no suggestion of a Brugada pattern, and his echocardiogram showed improving cardiac function with normal coronary measurements. Genetic testing was negative for pathogenic mutations that could result in a Brugada pattern.

Conclusion: Several case reports link the association between fevers and unmasked Brugada syndrome4-6,9,11,13 as well as COVID-19 and Brugada syndrome2,3,7,8,12. The pathogenesis by which Brugada syndrome is linked to COVID-19 is debated. Given that sodium channels are sensitive to temperature, the high fever of these COVID-19 patients could account for patients presenting with Brugada pattern on EKG7. However, one afebrile patient with COVID-19 did present with Brugada pattern5. The mechanism is unclear and likely multifactorial, including direct viral myocardial damage and an enhanced systemic inflammatory response2,8.

References:
1. Chang D, Saleh M, Garcia-Bengo Y et al. COVID-19 infection unmasking Brugada syndrome. Heartrhythm Case Reports. 2020;6(5):237–240
2. Choi N, Silver E, Fremed M et al. COVID-19 reveals Brugada pattern in an adolescent patient. Cardiology in the Young. 2020 (3):1–3
3. Mahadevagiah G, Aleem A, Secaira A. ST elevation in a patient with COVID-19 infection-associated fever: a case of Brugada pattern. Cureus Journal of Medical Science. 2020;12(6):e8722
4. Manohar S, Dahal B, Gitler B. Fever-induced Brugada syndrome. Journal of Investigative Medicine High Impact Case Reports. 2015;3(1)
5. Mirzapulos O, Marshall P, Brill A. Fever unmasked Brugada syndrome in pediatric patient: a case report. Clinical Practice and Cases in Emergency Medicine. 2020;4(2):244–246
6. Nene R, Tolia V. Fever-induced Brugada-pattern electrocardiogram. Journal of Emergency Medicine. 2020;59 (3):432–434
7. Pasqueto G, Conti G, Susana A. Syncope, brugada syndrome, and COVID-19 lung disease. Journal of Arrhythmia. 2020;36(4):768–770

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5. Mirzapulos O, Marshall P, Brill A. Fever unmasked Brugada syndrome in pediatric patient: a case report. Clinical Practice and Cases in Emergency Medicine. 2020;4(2):244–246
6. Nene R, Tolia V. Fever-induced Brugada-pattern electrocardiogram. Journal of Emergency Medicine. 2020;59 (3):432–434
7. Pasqueto G, Conti G, Susana A. Syncope, brugada syndrome, and COVID-19 lung disease. Journal of Arrhythmia. 2020;36(4):768–770
A case of argyria from a home-made battery-generated silver solution

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Background: Chronic silver ingestion can induce skin changes known as argyria. Use of a pre-made colloidal silver solution has been documented in literature, though the use of battery to generate a silver solution is less studied.

Objectives: To understand how chronic usage of a batter-generated silver solution can induce argyria

Method/Description: This is a single patient chart review.

A 68-year-old male with a history of rheumatoid arthritis presented to the Emergency Department with joint pain. His home medications included colloidal silver. He appeared well with stable vitals. His joint exam was unremarkable. His extremities were neurovascula

References:
1. Beck, R. The Beck protocol. 2020. Foundation for Health Research. https://www.bobbeck.com/pdfs/beck-protocol-handbook.pdf
2. Hadrup N, Lam H. Oral toxicity of silver ions, silver nanoparticles, and colloidal silver – a review. Regulatory Toxicology and Pharmacology. 2014;68(1):1–7
3. Kim J, Konkel K, McCulley L. Cases of argyria associated with colloidal silver use. Annals of Pharmacotherapy. 2019;53(8):867–870
4. Wadhera A, Fung M. Systemic argyria associated with ingestion of colloidal silver. Dermatology Online Journal. 2005;11(1):12
5. White J, Powel A, Brady K et al. Severe generalized argyria secondary to ingestion of colloidal silver protein. Clinical and Experimental Dermatology. 2013;28(3):254–6

Pneumomediastinum, acute kidney injury, rhabdomyolysis, and cryogenic dermal injuries secondary to inhalation abuse of keyboard cleaner

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Background: Inhalant abuse is the inhalation of volatile substances, such as halogenated hydrocarbons found in keyboard cleaner. Cryogenic injuries are well-known complications of keyboard cleaner abuse; pneumomediastinum, renal injury, and rhabdomyolysis are less common.

Objectives: To understand how inhalation abuse of halogenated hydrocarbons can lead to renal injury, rhabdomyolysis, barotrauma and pneumomediastinum, and cryogenic dermal injuries.

Method/Description: This is a single patient chart review.

A 31-year-old male presented to the Emergency Department by ambulance after inhaling 10 cans of “Dust Off” keyboard cleaner and found unconscious in his car. Vital signs revealed mild tachycardia and tachypnea. He was awake, alert, and not in acute distress. Multiple cryogenic burns were noted along his neck and chest. Computed tomography showed subcutaneous air in the base of the neck and mediastium. Serum studies were notable for creatinine (Cr) of 2.9 mg/dL and creatine kinase (CK) of 1,188 IU/L.

Results/Outcomes: The patient was admitted to the hospital. His pneumomediastinum was managed conservatively with broad spectrum antibiotics/antifungals. His renal injury was managed with intravenous hydration. The patient left against medical advice after three days of inpatient treatment.
Conclusion: The product abused by this patient contains 1,1 difluoro methane, a fluorinated hydrocarbon that causes CNS depression, respiratory irritation, arrhythmias, and cryogenic mucosal and dermal injuries. The compound is largely exhaled unchanged with renally excreted metabolites. Exposure to the rapidly cooled container resulted in cryogenic burns; elevated CK suggests mild rhabdomyolysis. He developed pneumomediastinum secondary to barotrauma of the tracheobronchial tree and esophagus. The increased Cr may be due to direct kidney injury from metabolites of 1,1 difluoroethane and/or renal filtration of myoglobin.

References:
1. Baydala L. Inhalant abuse. Pediatrics Child Health. 2010;15(7):443–54.
2. Kuspis DA, Krenzelok EP. Oral frostbite injury from intentional abuse of a fluorinated hydrocarbon. J Toxicol Clin Toxicol. 1999;37:873–875.
3. Plumb J, Thomas RG. Sudden severe perioral swelling associated with fluorinated hydrocarbon. J Forensic Sci. 2011;56(4):875–876.
4. Oberlin D.T., Cheng E.Y. (2015). Management of Pyocele of the Scrotum in the Pediatric Patient. Journal of Pediatric Urology 8(5) 504–508
5. Sakai K, Maruyama-Maebashi K, Takatsu A, et al. Sudden death involving inhalation of 1,1-difluoroethane (HFC-152a) with spray cleaner: three case reports. Forensic Sci Int. 2011;206:58–61.

Testicular pain and swelling secondary to a pyocele

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Background: Testicular pain is a common complaint in the emergency department. Etiologies ranging from the relatively benign epididymo-orchitis to the emergent testicular torsion. A pyocele is a less common cause for testicular pain.

Objectives: To understand the pathogenesis and management of a pyocele.

Method/Description: This is a single patient chart review.

A 61-year-old male presented to the Emergency Department with right testicular pain, swelling, and redness that had been worsening over one month. Vital signs were normal. Physical exam was notable for a 5cm right testicle that was tender to palpation, and less tender with scrotal elevation. Testicular ultrasound showed a large, complex hydrocele with internal irregular septations concerning for a pyocele. There was also increased vascularity in the right testicle and epididymis suggestive of acute epididymo-orchitis.

Results/Outcomes: Urology was consulted, who recommended outpatient follow-up and oral antibiotics. Per medical records, the patient followed up with urology 2 days later. The patient had stated his symptoms were improving. His physical exam showed mild right testicular tenderness and swelling, with appreciation of the right hydrocele. He was instructed to complete the course of antibiotics; no further management was recommended.

Conclusion: Scrotal pyoceles affect all age groups, and are located in the potential space that exists between the visceral and parietal tunica vaginalis. They may also extend into the inguinal canal. The condition is often associated with acute epididymo-orchitis, though rupture of a testicular abscess is also a cause. Symptoms include pain and swelling. Diagnosis is best made through testicular ultrasound. Treatment includes antibiotics and possibly surgical drainage, with orchiectomy as the ultimate method of management. If left untreated, pyoceles can progress to Fournier’s gangrene and sepsis.

References:
1. Bruner D., Ventura E., Devlin J. (2012). Scrotal Pyocele: Uncommon Urologic Emergency. Journal of Emergencies, Trauma, and Shock, 5(2) 206.
2. Butler J.M., Chambers J. (2008). An Unusual Complication of Epididymo-orchitis: Scrotal Pyocele Extending Into the Inguinal Canal Mimicking a Strangulated Inguinal Hernia. Journal of Emergency Medicine, 35(4). 379–384
3. Kraft K.H., Lambert S.M., Snyder H.M., Canning D.A. (2012). Pyocele of the Scrotum in the Pediatric Patient. Journal of Pediatric Urology 8(5) 504–508
4. Oberlin D.T., Cheng E.Y. (2015). Management of Pediatric Pyocele Using Percutaneous Imaging-guided Aspiration. International Journal of Surgery Case Reports 16 119–121
5. Pilatz, A., Boecker, M., Schuppe, H.C., &amp; Wagenlehner, F. (2016). Current Aspects of Epididymo-Orchitis. Europe PMC, 43(7), 237–242.
6. Slavis S.A., Kollin J., Miller J.B. (1989). Pyocele of Scrotum: Consequence of Spontaneous Rupture of Testicular Abscess. Journal of Urology 33(4) 313–316

Cruise ship patient presentation, admission, and intervention rates at a major referral emergency department

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Background: Cruise ships (CS) present unique issues when they come into port. Separate from the economic benefits a city may receive from a visit we seek to evaluate the frequency, characteristics, admission, and intervention rates of cruise ship patient presentations to a major referral ED.

Methods: This was an evaluation of CS patients presenting to Wellington Hospital ED between 2016 and 2019. Data regarding patient characteristics, referrals, imaging and interventions were extracted via retrospective chart review. Admission rates of CS patients were
compared to the general ED population and GP referrals. Data was analyzed statistically using SPSS software.

**Results:** 214 patients presented from CS. The median age was 68 (IQR 43.0–76.0) and 97/214 (45.3%) were female. The most common diagnoses are listed in table 1. CS doctors referred 63/214 (29.4%) patients. Patients self-presented in 135/214 (63%) of cases. Advanced imaging was requested for 46/214 (21.5%) patients and 21/213 (9.9%) patients required urgent intervention. Regarding admission, 37.9% of cruise patients were admitted compared with 35% of general ED patients. Self-referrals were more likely to be discharged (91/135, 67.4% vs 33/63, 52.4%, p < 0.001).

**Conclusion:** CS patients account for a small proportion of total ED patient load. Cruise ship doctors appear to refer appropriately given high rates of admission, intervention, imaging, and specialty review. Respiratory illnesses and infections are common and notably could be a significant departmental burden in the presence of a pandemic. EDs and CS medical teams should consider an escalation plan to work in partnership should such an event arise again in NZ.

**Comparison of ambulance offload delay between the emergency departments of an Australian and Canadian academic tertiary hospital**

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**Background:** Ambulance offload delay (AOD), a prolonged time between patient arrival via ambulance and the transfer of care to emergency department (ED) staff is a result of ED crowding. Patients brought to the ED by ambulance represent about 25% of the total ED population, tend to be older, less ambulatory, and have chronic health needs. Research on characteristics and outcomes of those who experience AOD is limited.

**Objectives:** To compare characteristics and outcomes of adult patients arriving by ambulance at The Alfred Hospital (Australia) and Sunnybrook Health Sciences Center (Canada). Our primary aim was to compare characteristics of patients who experienced AOD (>40 min in
Harnessing cognitive load theory to improve Pediatric emergency clinical reasoning, knowledge, and skills through an in-situ structured time-protected teaching curriculum—PEMPOWERHOUR

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Introduction: The Pediatric emergency department (PED) presents a dichotomy between its rich learning context and inherent pedagogical challenges. The complexity of the PED environment places high cognitive burdens on trainees, hindering learning and access to education (1). A recent departmental survey highlighted these challenges. Cognitive Load Theory (CLT) provides principles and strategies which effectively reconciles such dichotomy (2).

Description: Weekly, hour-long, time-protected teaching was provided to Royal Australasian College of Physicians trainees rotating in PED to develop Pediatric emergency clinical reasoning and skills. The PEMPOWERHOUR curriculum was designed based on CLT principles with trainee input before and throughout the program using a PDSA methodology. Teaching varied from case-based clinical reasoning to practical skill workshops utilizing task-trainers and quizzes. An interdisciplinary set of experts facilitated education. PEMPOWERHOUR was evaluated formatively via online surveys following each session and summative end-of-course surveys. A mixed-methods approach was utilized.

Outcomes: PEMPOWERHOUR was evaluated over four clinical rotations from February 2021 to January 2022. 74 of 82 Pediatric trainees responded to the post-course survey. PEMPOWERHOUR had an overall rating of 9.6/10. 100% of trainees found teaching accessible and agreed that a time-protected structured curriculum was beneficial for their professional development. Moreover, trainees felt that their learning needs were valued.

Conclusions: PEMPOWERHOUR demonstrates that a structured time-protected teaching program, informed by CLT, is a valuable way of ensuring quality and accessible education in the PED. This model can be translated to other complex healthcare environments where the nature of the clinical settings detracts from trainee education.

A tale of two brothers with bloody diarrhea

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Introduction: Acute lower gastrointestinal bleeding (LGB) is a rare and potentially life-threatening complication of Crohn’s disease (CD) \textsuperscript{1,2}. Severe LGB in CD has been reported in the extreme of ages with the most common bleeding sites in the descending and sigmoid colon \textsuperscript{3}. We report a case of a teenager who was newly-diagnosed with CD after presenting with significant LGB.

Description: A 15-year-old male with a background of chronic diarrhea for the past 1 year presented acutely to the emergency department with large amount of hæmatochezia, lethargy, and hypovolemic shock. He was previously treated for infective diarrhea by his primary care provider. His younger sibling also had chronic diarrhea and intermittent PR bleeding awaiting surgical follow-up. His initial hemoglobin was 9.7 g/dL which later dropped to 7 g/dL. Proctoscopy revealed fresh blood mixed with stool. CTA showed active bleeding from distal branch of left colic artery requiring angioembolization to achieve hemostasis.

Outcomes: The patient was admitted for blood transfusion and further workup. Sigmoidoscopy revealed deep ulcerations and loss of vascular pattern in the sigmoid colon. HPE of ulcers favored a diagnosis of CD. He was medically treated with oral aminosalicylate and corticosteroids and discharged well with gastroenterology follow-up.

Conclusions: Acute LGB in CD is challenging as there are no current consensus or guidelines in treatment modalities \textsuperscript{4}. However, primary resuscitation with blood
transfusion and urgent surgical referral remains the core principles in the management of hemodynamically unstable patient with LGIB. Angioembolization presents as an option to attain hemostasis in patients with massive LGIB prior to colonoscopy1.

250 words

References:
1. Lee KC, Kuo CJ, Tseng JH, et al. (2020). The presentation of Crohn’s disease with acute massive gastrointestinal hemorrhage. Advances in Digestive Medicine: Vol 7(4): 223 – 226.
2. Podugui, A., Tandon, K., & Castro, F. J. (2016). Crohn’s disease presenting as acute gastrointestinal hemorrhage. World Journal of Gastroenterology, 22(16), 4073–4078.

Resilience despite trauma—Comparing resilience between Lebanese EMTs and the Lebanese general population: A cross-sectional study

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Background: Resilience is a rising concept of interest among vulnerable populations and is thought to correlate with mental well-being and work productivity. It is of particular interest to workers in the humanitarian field exposed to trauma firsthand. While most studies focus on correlating trauma exposure with psychiatric comorbidities, we explore a potential relationship between trauma and resilience. Having undergone a COVID pandemic, an unprecedented economic collapse, and the Beirut blast during recent years, Lebanese Red Cross Emergency Medical Technicians (EMTs) are an ideal prototype for our research question.

Objectives: We are primarily comparing the average resilience scores between EMTs and Lebanese general population samples. Secondary objective is evaluating various factors’ relationship with resilience among EMTs.

Method: This is an ongoing cross-sectional study comparing a sample of the Lebanese Red Cross EMTs and that of the Lebanese general population. To date, a total of 329 participants are enrolled. The assessment is done using the 10-item Connor-Davidson Resilience Scale, the 5-item Satisfaction with Life Scale, and a sociodemographic survey including factors such as leadership, training, and social support. Using SPSS, bivariate analysis evaluated relations between those factors and resilience, using independent samples T-test, Chi-square test, Pearson and Spearman correlation tests when appropriate. Linear regression models were used to adjust for confounding variables and determine factors predictive of resilience and satisfaction scores. A p-value < 0.05 is considered significant.

Results: Included participants are Lebanese above 17 years old. We excluded those with a history of substance/alcohol abuse, mental illness, and childhood trauma, all being factors affecting resilience. The included sample of 217 has an equal sex distribution and a mean age of 40 ± 15.7. EMTs showed a significantly higher resilience mean score than the general population (difference = −4.39, 95%CI [−6.52, −2.27]; P < 0.001). An increase in salary has shown to be predictive of increased resilience (p = 0.031) and life satisfaction (p = 0.013).

Conclusion: Further analysis should be done after a larger sample size is attained. However, the current preliminary data shows promising results and highlights the need to explore the factors of EMTs’ wellbeing, as they can be considered and targeted among other vulnerable populations.

Assessing emergency department readiness for implementation: Barriers and facilitators for change prior to implementation of Surgeon

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Background: Implementations of e-health systems in Emergency Departments (EDs) encounter significant challenges due to the complexities of the environment1. Identifying barriers and facilitators can help create context-specific implementation strategies to ensure e-health system success; however, there has been limited identification of these factors for e-health implementations in the ED2.

Objective: This study assesses the context of two rural EDs prior to implementing SurgeCon – an e-health quality improvement system to increase ED efficiency and patient satisfaction. The goal is to identify perceived barriers and facilitators of implementing such an e-health system and propose an implementation process to address these factors.

Method: Data were collected by means of 20 in-depth semi-structured interviews with healthcare providers and
structured observation of two rural EDs. The data were analyzed using the grounded theory method³.

Results: Key facilitators for change include supportive and receptive managers, strong team communications, and positive exemplars of past interventions. Key barriers include past experiences of non-effective leadership, weak teamwork, and negative exemplars of past interventions. These factors are inherently around change management; thus, we propose methods to address these barriers and facilitators in the implementation process using Kotter’s 8-step change process⁴ and other change models.

Conclusion: Exploring barriers and facilitators is a necessary precursor to how best to expedite the implementation and adoption of e-health systems, especially in the dynamic and complex organizational life of EDs. This study identifies barriers and facilitators and informs how to incorporate them into the design of the implementation of an e-health system in the ED.

References:
1. S. Saghaeiannejad-Isfahani, F. Hazhir, and R. Jalali, “An assessment of emergency department information systems based on the HL7 functional profile,” J. Educ. Health Promot., 2019; vol. 8.
2. Schreiweis, B., Pobiruchin, M., Strotbaum, V., Suleder, J., Wiesner, M., & Bergh, B. Barriers and facilitators to the implementation of eHealth services: systematic literature analysis. Journal of medical Internet research, 2019; 21(11), e14197.
3. Strauss, A. L., & Corbin, J. M. Basics of qualitative research: Techniques and procedures for developing grounded theory (2nd ed.). Sage. 1998.
4. Kotter J. Accelerate: Building Strategic Agility for a Faster-Moving World. 60 Harvard Way, Boston, Massachusetts: Harvard Business School Publishing; 2014, 02163.

Introduction: Door to needle time less than 30 min is a quality indicator for the fibrinolytic therapy in acute STEMI and health ministry of Sri Lanka recommends, this should be achieved in more than 90% of subjects who presented to the hospital¹ ².

Description: Teaching Hospital, Kurunegala (THK) is the tertiary care referral center of Northwestern province of Sri Lanka for 2.38 million population. As facilities for primary percutaneous coronary intervention was limited, thrombolysis with Tenecteplase is the main mode of treatment for STEMI.

The door to needle time was far beyond the target in the initial period. Clinical audit started to identify the system issues and rectified.

Outcomes: Unavailability of dedicated resuscitation and on-site electro-cardiographer at Accident & Emergency Treatment Unit (A&E) were identified. Decision making was delayed as it was taken by the Cardiology team and was done at Coronary care unit after moving patient to the Cardiology unit by an ambulance. Following changes were employed and progress was continuously monitored. Three bedded resuscitation bay was arranged, and A&E staff were trained to take emergency ECGs. Decision making and thrombolysis responsibility was taken over by A&E team with consultation of Cardiology team in grey cases. Out of hour on-site A&E consultant coverage was arranged.

Progress is shown in the table and the figure.

Steady improvement of thrombolysis within 30 min is achieved, yet not the optimal.

Conclusions: Identification of system related problems and remedial actions will improve clinical quality indicators.

References:
1. Implementation of clinical indicators in all four major specialties. Ministry of Health, Nutrition & Indigenous Medicine 2017:8–9.
2. Armstrong PW, Collen D, Antman E. Fibrinolysis for acute myocardial infarction: the future is here and now. Circulation. 2003;107:2533–2537.

TABLE 1 - Quarterly breakdown of patients requiring reperfusion therapy for STEMI

|                      | 1st 2020 | 2nd 2020 | 3rd 2020 | 4th 2020 | 5th 2021 |
|----------------------|----------|----------|----------|----------|----------|
| Total patients with acute STEMI | 152      | 82       | 162      | 129      | 121      |
| Primary coronary intervention | 35       | 24       | 29       | 13       | 20       |
| Thrombolysis with Tenecteplase      | 117      | 58       | 133      | 116      | 101      |
| Thrombolysis within 30 min          | 12       | 9        | 31       | 54       | 62       |
Management of paracetamol overdose and application of guidelines in an emergency department Australia

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Background: Paracetamol is involved in many poisonings due to attempted deliberate self-harms and unintentional overdoses. A study done in New Zealand revealed low adherence to the guidelines with greatest deviation due to increased biochemical analysis1.

Objectives: To audit management of paracetamol poisoning in a large tertiary emergency department with the aim of assessing compliance to established guidelines2.

Method: All patients who presented to the emergency department and had final diagnosis of 4-Aminophenol derivatives (paracetamol) poisoning in EDIS over the period from 30/11/2017 to 30/11/2018 were retrospectively audited for compliance to national guidelines using hospital clinical records.

Results: A total of 123 paracetamol poisoning incidents over the period were assessed. There were 113 single ingestions and 10 staggered paracetamol overdoses with 41(33.1%) of them involving polypharmacy. Thirty-six (61%) patients who fulfilled the clinical criteria for acute paracetamol poisoning had elevated paracetamol levels above the nomogram. Forty-one (33.1%) patients were treated with full course of N-acetylcysteine (NAC) and NAC was started and subsequently stopped in 4 patients after receiving the paracetamol level.

The most common guideline deviation observed was ordering of too many investigations. Only paracetamol level measurement is recommended for presentations within 8 h2, which was compliant only in 13 cases. Paracetamol level was checked in eight patients before 4 h of ingestion. All patients who had evidence of paracetamol poisoning received appropriate treatment with NAC. Psychiatric treatment, review or follow up was arranged for required patients.

Conclusion: Appropriate treatment received for all paracetamol poisoned patients, but actions are needed to improve adherence with regard to ordering investigations.

References:
1. Fountain JS, Hawwari H, Kerr K, Holt A, Reith D. Awareness, acceptability and application of paracetamol overdose management guidelines in a New Zealand emergency department. The New Zealand Medical Journal (Online). 2014 Sep 12;127(1402):20.
2. Chiew AL, Fountain JS, Graudins A, et al. Summary statement. New guidelines for the management of paracetamol poisoning in Australia and New Zealand. Med J Aust 2015; 203: 215–218.

Evolving swabbing practices for COVID-19 in the emergency department: An evaluation of the use of case definitions in an emerging pandemic

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| Investigations                  | Paracetamol level above nomogram (n = 20) | Paracetamol ingested below toxic dose or level below nomogram (n = 52) |
|---------------------------------|------------------------------------------|---------------------------------------------------------------------|
| Urea-electrolyte-creatinine     | 100%                                     | 67.3%                                                               |
| Liver function tests            | 100%                                     | 66.4%                                                               |
| Full blood count                | 95%                                      | 66.4%                                                               |
| Prothrombin time/INR            | 75%                                      | 26.9%                                                               |
| Venous blood gas                | 25%                                      | 3.8%                                                                |

Table 1: Compliance of swabs with Case Definition criteria for March 15 and April 8 Case definitions. Non-missing data is included only

March 15th Case Definition | April 8th Case Definition
----------------------------|---------------------------|
Meets Case Definition      | Meets Case Definition     |
Does not meet Case Definition | Does not meet Case Definition |

n/non-missing values | n | % (95%CI) | n | % (95%CI) |
19/164 | 11.6 | 7.5 - 17.5 | 145/164 | 88.4 | 82.5 - 92.5 | 300/340 | 88.2 | 84.3 - 91.3 | 58/406 | 11.8 | 8.7 - 15.7 |
TABLE 2: Ministry of Health case definition criteria for March 15 and April 8 COVID-19 case definitions

| March 15 case definition | April 8 case definition |
|-------------------------|-------------------------|
| Clinical Criteria       |                         |
| Fever (≥38°C) OR any acute respiratory infection with at least one of the following symptoms: shortness of breath, cough, or sore throat with or without fever | Any acute respiratory infection with at least one of the following symptoms: cough, sore throat, shortness of breath, coryza, or anosmia with or without fever. |
| Exposure Criteria       |                         |
| Travel to or from (excluding airport transit) countries or areas of concern within 14 days before onset of illness OR Close contact or casual contact with a suspected, probable or confirmed case of SARS-CoV-2 infection in the 14 days before onset of illness | No specific exposure criteria |
| Alternative criteria    |                         |
| Healthcare workers with moderate or severe community-acquired pneumonia AND regardless of any international travel |                         |
| Surveillance criteria   |                         |
| Critically ill patients in ICU/HDU with bilateral severe community-acquired pneumonia AND no other cause is identified AND no source of exposure has been identified (ie, regardless of travel history) |                         |

Background: In response to the emerging COVID-19 pandemic, New Zealand entered a nationwide lockdown in March 2020. During this period, the case definition used to identify those who should be tested for COVID-19 changed considerably, requiring rapid implementation during a time of high anxiety among clinicians.

Objective: To review if tests for suspected COVID-19 were performed according to the Ministry of Health (MoH) case definitions, identify patterns associated with non-compliance, and evaluate subsequent impacts on hospital services.

Methods: This was a retrospective audit of patients presenting to the Wellington Hospital Emergency Department (ED) between 24 March 2020 and 27 April 2020 who were swabbed for COVID-19 in ED. Swabs were audited against the March 15 and April 8 MoH COVID-19 case definitions.

Results: During the study period, 536 COVID-19 swabs were administered in ED from 518 patients. There was low compliance with the March 15 case definition at 11.6%. Of the 145 swabs that did not meet the March case definition, the majority (n = 119, 82.1%) met symptom but not exposure criteria. Compliance with the April 8 case definition was much higher at 88.2%. Factors associated with testing outside criteria included fever (≥38°C), cancer, hospital admission and, for the March case definition only, ‘contact with a traveler’.

Conclusion: Clinician risk perception was influential on compliance with both case definitions and clinicians’ choices to test outside of guidelines were associated with specific variables. Poor compliance with case definitions can impact hospital services. Improved communication and feedback processes for clinicians may improve their implementation in a clinical setting.

Rizal D. Aportadera formula versus Parkland formula in the fluid resuscitation of patients with burn injuries: Cohort study

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Background: Fluid management in a burn injury is crucial during the first 24 h due to different systemic responses of the body.

Objective: To compare the outcomes of patients with partial-or full-thickness burns initially managed using the Parkland formula with those managed using the Rizal...
D. Aportadera (RDA) formula, a fluid resuscitation formula with added sodium bicarbonate.

**Method:** this is a cohort study of 181 male and female patients with partial or full thickness burns managed at RDA Burn Unit in Southern Philippines Medical Center from January 2008 to December 2018. Proportions of patients with prolonged hospital stay, sepsis, death, odds ratio of having outcomes for selected factors were determined.

**Result:** Of the 126 males and 55 females, with overall mean age 25.70 ± 20.92 years, 175 (96.69%) had partial-thickness burns and 6 (3.31%) had full-thickness burns. Among the patients, 108/181; 59.67% were managed with the Parkland formula, while 73/181 (40.33%) were managed with the RDA formula during fluid resuscitation. Compared to the Parkland group, the RDA group had significantly lower mean length of hospital stay (11.67 ± 9.69 days vs 17.22 ± 20.45 days; p = 0.0317) and lower proportion of patients with prolonged hospital stay (2/73, 2.74% vs 13/108, 12.04%; p = 0.0287). Full-thickness burns had independent association with prolonged hospital stay, while major burns had independent association with death.

**Conclusion:** Comparing patients in the group, those in the RDA group had significantly shorter hospital stay. Full-thickness burns and major burns were independently associated with prolonged hospital stay and death, respectively.

**Sodium bicarbonate versus Sodium chloride for the prevention of contrast-induced acute kidney injury in patients with renal impairment, a systematic review**

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**Introduction:** Contrast-induced acute kidney injury (CI-AKI) is sporadic in patients with normal kidney functions; however, the incidence is exponentially rising in patients with renal impairment. In patients with renal impairment, what is the efficacy of sodium bicarbonate compared to sodium chloride in the prevention of CI-AKI?

**Description:** A literature search was carried out to 25th of December 2019 through PubMed, Ovid

| Title, Date | Study /Journal | Patient group | outcomes | Key results |
|-------------|----------------|---------------|----------|-------------|
| Zhang B, Liang L, Chen Wb et al. 2015 China | Meta-analysis BMJ | adult patients CKD 20 RCTs (n = 4280) | Primary: incidence of CIN | Primary: No significant difference between groups. |
| Boucek et al. 2013 Czech Republic | RCT Diabetes Research and Clinical Practice (ELSEVIER) | adult patients with DM and renal impairment | Primary: CIN within two days. | Primary: No significant difference between groups. |
| Kooiman et al. 2014 Netherland | RCT Nephrology dialysis transplantation (ndt) | adult patients GFR < 60 ml/min.1.73 m2 | Primary: the relative increase in SCr48–96 h post-CE-CT Secondary: CIN | Primary: No significant difference between groups. Secondary: No significant difference between groups. |
| Solomon et al. 2015 USA | RCT Clinical Journal of American Society of Nephrology (CJASN) | adult undergoing coronary or peripheral angiography with eGFR < 45 ml/min | Primary: Death, RRT, reduction in eGFR>20% (day30,180) Secondary: CIN | Primary: No significant difference between groups. Secondary: No significant difference between groups. |
| PRESERVE study 2018 USA | RCT The new England journal of medicine (NEJM) | GFR 15–44.9 ml/min.1.73 or DM eGFR 45–59.9 ML (min.1.73 m2 BSA (n = 7680) | Primary: composite (death, dialysis or > 50% SCr increase at 90–104 days) Secondary: CIN | Primary: No significant difference between groups Secondary: No significant difference |

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Cochrane Risk of Bias

|                                | Boucek et al. 2013 | Kooiman et al. 2014 | Solomon et al. 2015 | PRESERVE, 2018 |
|--------------------------------|--------------------|---------------------|---------------------|----------------|
| Selection bias                 | Low risk.          | Low risk.           | Low risk.           | Low risk.      |
| Randomization, sequence        | computer-generated | computer-generated  | central registry    | computer-generated |
| generation                     | schedule           | allocation sequence |                     | allocation sequence |
| Concealment                    | Low risk.          | Unclear.            | Low risk.           | Low risk.      |
|                                | sealed envelope    | Not described       | Sealed envelope     | sealed envelope |
| Performance bias               | Low Risk           | High Risk           | Low Risk            | Low Risk       |
| Blinding of participants       | Double-blind       | Open-label study    | Double-blind        | Double-blind   |
| Detection bias                 | Low Risk           | Low Risk            | Low-risk.           | Low Risk       |
| Blinding of assessors          | All the investigators were blinded | All the investigators were blinded | All the investigators were blinded | All the investigators were blinded |
| Incomplete outcome data        | Low risk.          | Low risk.           | Low risk.           | Low Risk       |
| (attrition bias)               |                    |                     |                    |                |
| Reporting bias                 | Low risk.          | Low risk.           | Low risk.           | Low risk.      |
| Selective reporting            | Reported all       | Reported all        | Reported all        | Reported all   |
|                                | outcomes           | outcomes            | outcomes            | outcomes       |
| Modified JADAD score           | 8                  | 5                   | 6                   | 8              |

Reference:
Andreucci M. Side effects of radiographic contrast media. Biomed Res Int. 2014;2014.

First jurisdiction-wide report using ACEM hospital access targets

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Background: Hospital Access targets (HATs) are a more comprehensive description of performance than Access Block or 4-hour status. The Capital Territory Hospital Access Targets study researches the utility of HATs in guiding management approaches.

Objectives: To present the first jurisdiction-wide HAT data collected before interventions.

Methods: Prospective study of EDs (A and B) in the Australian Capital Territory, describing monthly HAT performance Jul-Dec 2021. Presentations were classified as Admitted/Transferred, Admitted Short Stay Unit (SSU) or Discharged and total ED time was classified as above or below 4, 8 and 12 h.

Results: For Admitted/Transferred patients, Hospital A averaged 15.4% (95%CI 14.2–16.6) at 4 h, 43.0% (41.4–44.7) at 8 h and 65.0% (63.5–66.6) at 12 h, compared to ACEM recommendations of 60%, 90%, and 100%. Hospital B averaged 21.8% (21.0–22.7), 67.1% (66.2–68.1), and 89.5% (88.8–90.1). Hospital A had worse performance during lockdown than before, Hospital B the reverse.

For SSU patients, Hospital A averaged 61.1% (95%CI 59.4–62.7) at 4 h, 88.5% (87.3–89.5) at 8 h and 95.5% (94.8–96.2) at 12 h, compared to recommendations of 60%, 90% and 100% respectively and Hospital B averaged 54.7% (53.6–55.9), 90.7% (89.9–91.3), and 98.2% (97.8–98.5).

For discharged patients, neither hospital achieved recommendations of 80% at 4 h, one achieved 95% at 8 h, and neither achieved the 100% 12-h threshold.

Conclusions: Hospital Access was poor at 12 h compared to ACEM recommendations and extremely poor at all times for admissions/transfers in both EDs in the ACT. Differences between EDs should assist in designing future interventions.
Impact of COVID-19 pandemic response on ED bronchiolitis presentations

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Background: The COVID-19 pandemic in the Australian Capital Territory was associated with two major lockdowns and other changes in population mobility which could impact the transmissibility of respiratory illness.

Objective: To describe changes in ED bronchiolitis diagnoses during the pandemic in a tertiary mixed adult/Pediatric hospital.

Methods: Prospective descriptive study of all patients given the clinical diagnosis of bronchiolitis in 2020 and 2021 in the Canberra Hospital with historical controls from 2017–2019. Each year was divided into consecutive four 10-week and one 12-week periods, and weekly numbers compared using the t-test (unequal variance).

Results: Control periods showed a regular early winter peak (weeks 21–30) averaging 23.5 weekly cases compared to 5.1 in weeks 1–10. In 2020, this peak was absent, averaging 2.8 per week (P < 0.0001), but there was an unexpected peak at the end of the year (weeks 41–52), averaging 18.5 weekly (peak of 33) compared to 7.2 controls, extending into early 2021. The winter peak in 2021 was not statistically different over the 10-week period, but individual week analysis showed a late peak which terminated just after lockdown started. During the last 12 weeks of 2021, average weekly diagnoses were the lowest ever at 2.2 (P < 0.0001). Microbiological data supported the patterns with corresponding peaks and troughs of Respiratory Syncytial Virus diagnoses on viral swabs.

Conclusions: The COVID-19 pandemic was associated with a marked decrease in bronchiolitis during and immediately after lockdown periods, and one unexpected summer peak. Community precautions against respiratory transmission have a significant effect on ED workload.

Successful resuscitation following penetrating cardiac injury

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Introduction: Trauma ranks among the leading causes of death in the Philippines despite the COVID-19 pandemic.¹ Most patients with penetrating cardiac injury die before reaching the hospital, even with advances in prehospital care and trauma life support.² Rapid transport to a trauma center and timely intervention, however, remain important steps in the management of these patients.

Davao City Central 911 is one of few emergency medical response centers in the Philippines with personnel and equipment capable of providing adequate prehospital trauma life support. Emergency medical services (EMS) in the Philippines still largely remain unavailable in many healthcare systems in the country, especially in rural areas.

Description: This paper discusses a case of penetrating cardiac injury brought to the emergency department (ED) by Davao City Central 911, from prehospital care to ED resuscitation.

Outcomes: The patient was successfully resuscitated and underwent definitive management in the operating room and was eventually discharged well on outpatient follow up.

Conclusions: Penetrating cardiac injury is rapidly fatal, and a well-developed EMS system is necessary to bridge these patients from the field to the operating room.

References:
1. Philippine Statistics Authority (August 20, 2021). Causes of Deaths in the Philippines (Preliminary): January to June 2021. Retrieved from https://psa.gov.ph/content/causes-deaths-philippines-preliminary-january-june-2021
2. Morse, Bryan C.; Mina, Michael J.; Carr, Jacquelyn S.; Jhunjhunwala, Rash; Dente, Christopher J.; Zink, John U.; Nicholas, Jeffrey M.; Wyrzykowski, Amy D.; Salomone, Jeffrey P.; Vercruyse, Gary A.; Rozyczki, Grace S.; Feliciano, David V. (2016). Penetrating cardiac injuries. Journal of Trauma and Acute Care Surgery, 81(4), 623–631. doi:10.1097/TA.0000000000001165

Diagnostic performance of S100B as a rule out test for intracranial pathology in head injured patients presenting to the emergency department

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Background: Traumatic brain injuries (TBI) are a major public health issue internationally.¹ Most patients present to Emergency Departments (ED) for assessment.² Clinical biomarkers may support ED clinical decision making in patients with TBI and reduce escalating CT-head use and resource pressure.³–⁶

Objectives: This study aims to investigate if S100B can safely rule out significant intracranial injuries in adult patients who present to ED with TBI.

Method: Prospective multicenter observational study of adult patients presenting to ED within 6-h of head injury, who required a CT-head as part of standard care. Consecutive sampling methods were used, and informed consent was obtained prior to drawing a venous blood

Diagnostic performance of S100B as a rule out test for intracranial pathology in head injured patients presenting to the emergency department

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Objectives: This study aims to investigate if S100B can safely rule out significant intracranial injuries in adult patients who present to ED with TBI.

Method: Prospective multicenter observational study of adult patients presenting to ED within 6-h of head injury, who required a CT-head as part of standard care. Consecutive sampling methods were used, and informed consent was obtained prior to drawing a venous blood
sample. Serum was stored in a biobank and batch tested for S100B using a Cobas Elecsys S100-module; >0.1 μg/ml is the validated threshold indicating a positive test. CT-head scans were considered positive in the presence of acute traumatic pathology.

**Results:** There were 133 included patients, and 16 (12.0%) had a positive CT-head. Median S100B levels for those with positive CT-heads was 0.36 (IQR 0.17–0.52) vs 0.15 (IQR 0.09–0.31), p = 0.03. The sensitivity of S100B was 93.8% (95% CI 69.8–99.8%) and specificity was 30.8% (22.6–40.0%). NPV was 97.3% (95% CI 84.2–99.6%). Theoretically, CT-head use would have reduced by 27.1%. The risk of missing a significant injury was 0.75%.

**Conclusion:** S100B has good diagnostic ability to rule out significant intracranial pathology seen on CT-head in patients that present to ED with TBI within 6 h of injury. Theoretically, one-quarter of CT-heads could have been avoided if S100B was used as a rule out test.

**References:**
1. James SL, Theadom A, Ellenbogen RG, et al. Global, regional, and national burden of traumatic brain injury and spinal cord injury, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet Neurology. 2019;18(1):56–87.
2. Pozzato I, Meares S, Kifley A, et al. Challenges in the acute identification of mild traumatic brain injuries: results from an emergency department surveillance study. BMJ Open. 2020;10(2):e034494
3. Rogan A, Patel V, Birdling J, et al. Acute traumatic brain injury and the use of head computed tomography scans in the emergency department. https://doi.org/10.1177/14604086211023646. 2021–06–142021.
4. Mondello S, Sorinola A, Czeiter E, et al. Blood-Based Protein Biomarkers for the Management of Traumatic Brain Injuries in Adults Presenting to Emergency Departments with Mild Brain Injury: A Living Systematic Review and Meta-Analysis. Journal of Neurotrauma. 2021;38(8):1086–1106.
5. Amoo M, Henry J, O’Halloran PJ, et al. S100B, GFAP, UCH-L1 and NSE as predictors of abnormalities on CT imaging following mild traumatic brain injury: a systematic review and meta-analysis of diagnostic test accuracy. Neurosurg Rev. Oct 28 2021.
6. 16. Czeiter E, Amrein K, et al. Blood biomarkers on admission in acute traumatic brain injury: Relations to severity, CT findings and care path in the CENTER-TBI study. Vol 56: Elsevier B.V.; 2020: 102785
A prospective observational study evaluating the prognostic performance of the modified SOFA (mSOFA) score in emergency department patients admitted to hospital with suspected infection

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Background: Infectious diseases make up the largest contribution to hospital admissions of any cause. There is limited information on outcomes for people acutely hospitalized for infection in New Zealand.

Objectives: The primary study aim is to prospectively evaluate sepsis scores in a representative observational cohort of Emergency Department patients expected to be hospitalized with infection, using clinical baseline and outcomes information already collected during clinical care.

Method: Prospective observation study of adult patients admitted to hospital with a suspected infection from a New Zealand metropolitan Hospital Emergency Department. Baseline demographic and clinical data will be collected from ED. Outcome data including mortality, hospital length of stay and discharge diagnosis will be collected from routinely recorded data. Sepsis scores (mSOFA) will be calculated based on ED clinical data. The primary study analysis would examine the performance of the mSOFA score in prediction of mortality at different time-points (inpatient, 30 day, 90 day).

Results: Upon submission of this abstract, baseline data has been collected for 167 patients (female 52%, male 48%). Ethnicity data shows the patients admitted to hospital are Maori (11.4%), Pacific (12.0%), NZ European (56.9%), Asian (5.4%), and Other (14.4%). The mean age of patients admitted to hospital is 57 years.

Conclusion: We are currently in the early stages of data collection and intend for this to be an ongoing study. We expect to have sufficient data, calculated mSOFA scores and results to present for ICEM 2022.

Reference:
1. Raymond NJ, Nguyen M, Allmark S, Woods L, Peckler B. Modified sequential organ failure assessment sepsis score in an emergency department setting: retrospective assessment of prognostic value. Emerg. Med.Australas.2019; 31: 339–46.

Education needs in diagnosing rare diseases in emergency medicine: A clinician survey

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Background: Many patients with undiagnosed rare diseases present to the emergency department repeatedly without receiving a diagnosis. Undiagnosed patients may undergo inappropriate or harmful testing or medication, and disease progression.

Objectives: We sought to identify gaps and education needs in the diagnosis of rare diseases for emergency medicine (EM) physicians.

Method: A 14-question online survey to assess clinician knowledge, experience, and educational needs in rare disease was emailed to Medscape member physicians. It launched on March 31, 2021 and closed on August 2, 2021.

Results: A total of 927 physicians specializing in 16 different therapeutic areas participated, including 61 EM physicians from the EU or US. Approximately 2/3 of EM physicians considered rare diseases much rarer compared with standard definitions in the EU (5 per 10,000) or US (<200,000). And 32% said they never or rarely (1x/year) see rare disease patients. Although 79% have been involved in a rare disease diagnosis, only 10% were mostly and none were very confident in making such a diagnosis. Barriers differed between US and EU neurologists (Table). When asked about most effective rare disease education, case-based, text-based, and short-format education, given by world renowned clinicians were most

| TABLE. Outcomes of Survey Question, How often do you experience the following as barriers to diagnosing rare diseases in your practice? | Never or Rarely | Sometimes | Often | Always |
|---|---|---|---|---|
| | EU5 | US | EU5 | US | EU5 | US | EU5 | US |
| Sufficient knowledge regarding signs and symptoms that should trigger suspicion | 6% | 3% | 47% | 45% | 37% | 48% | 10% | 3% |
| Sufficient time to investigate properly | 16% | 3% | 13% | 16% | 47% | 58% | 23% | 23% |
| Availability of diagnostic guidelines | 23% | 13% | 33% | 42% | 33% | 42% | 10% | 3% |
| Access to diagnostic tests | 23% | 29% | 30% | 23% | 27% | 48% | 20% | 0% |
| Knowing where to refer the patient | 27% | 45% | 27% | 39% | 40% | 13% | 7% | 3% |
ABSTRACT

A case of rare presentation of abrus precatorius poisoning

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Introduction: Abrus precatorius (rosary pea or jequirity pea) is common to many tropical areas throughout the world and is sometimes used as an herbal remedy in folk medicine. All parts of the plant are poisonous and the seeds are often ingested as a means of suicide in our country. Here we report case of Abrus precatorius poisoning with raised intracranial pressure (ICP) and papilledema, a rare presentation with CNS manifestation. Very few cases have been documented with this presentation −5.85%.

Case Report: A seventeen-year-old woman presented to ED with alleged history of consumption of ten crushed seeds of Abrus precatorius, within four hours of consuming the seeds, she developed multiple episodes of vomiting. Her vital signs were stable with a pulse rate 100 beats/ minute and blood pressure 110/70 mmHg. Physical examination was unremarkable. Gastric lavage followed by activated charcoal (50 grams every eight hours), and intravenous hydration was given. Gastric lavage showed crushed remnants of the seeds that were identified by their distinctive red outer covering. During her hospital stay Patient developed loose watery stools on day 2, 6 to 8 episodes per day, associated with epigastric pain and tenderness that continued until day 3. On day 4 her diarrhea turned bloody and the abdominal pain worsened. She was hydrated adequately and was managed symptomatically. On day 6 Patient developed altered sensorium in the form of drowsiness and slurred speech. Central nervous system examination revealed grade 2 sensorium with GCS of 10/15. Both pupils were 3 mm and reactive to light. She was moving her limbs in response to pain and deep tendon reflexes were exaggerated with bilateral extensor plantar response with no neck stiffness. Detailed motor and sensory examination could not be carried out in view of altered sensorium. Lab parameters were within normal range. An ophthalmologic examination at this point revealed bilateral established papilledema. CT scan of the brain showed diffuse cerebral edema and features suggestive of raised ICP. Patient was started on mannitol, dexamethasone and acetazolamide. Inj.ceftriaxone 2 g IV twice daily was added empirically. Her sensorium remained poor with incomprehensible sounds, bowel & bladder incontinence. Patient had deranged renal parameters, hypotension, hypokalemia during the hospital stays, with a urine output of 2 liters / day. Hyponatremia and hypokalemia treated conservatively, her serum urea and creatinine returned to baseline (without dialysis) over a 10-day period. By the end of the second week her sensorium started improving and became normal by the third week of hospital stay. Repeat fundus examination showed resolving papilledema. Mannitol and dexamethasone was tapered gradually and she was discharged after a month-long hospital stay. Patient in follow up visit had no features of Raised ICT.

Conclusion: In the light of our experience, we would like to propose CNS evaluations, such as fundus examination and brain imaging, to look for signs of raised ICP in all cases of severe Abrus precatorius poisoning; more so if the patient has evidence of CNS toxicity like seizures or altered sensorium. Early diagnosis and treatment may decrease the mortality rate.

A practical framework for fuzzy logic-based ED diagnosis–Addressing challenges to introduce AI into clinical practice

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Background: Recent explosion of advances in machine learning (ML) including artificial intelligence (AI) application to health data has created both an opportunity and a challenge for clinical practice. The opportunity lies in the power of AI and ML to recognize patterns which can improve medical diagnostics and prognostics. AI techniques often present as black boxes performing sophisticated maths that is hard to evaluate. The challenge lies in the lack of regulations, standards, evaluations, and transparency, trust of clinicians and community, and guidelines which hinders benefiting from AI in clinical practice including ED diagnosis.

Objectives: The objective of this paper is to propose a framework to improve transparency and reproducibility of fuzzy logic-based ED diagnosis.

Methods: To achieve this objective, this paper presents Fuzzy logic-based diagnosis elements and integrated function in a format of precise look up tables that can be used in clinical studies including randomized control trials (RCTs) for evaluation.

Results: Proposition of a transparent framework for application of Fuzzy-logic based ED diagnosis to assist ED doctors to improve diagnosis, safety, and precision towards a better patient outcome in time sensitive presentations.

Conclusion: The proposed method contributes to developing protocols when involving AI in clinical trials to evaluate fuzzy logic-based ED diagnosis.
Air hunger at the tunnel by large mediastinal mass in the emergency room

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Background: Large anterior mediastinal mass pose a risk of airway compromise and they can be either symptomatic or asymptomatic. Cough, stridor, and dyspnea are present in 75% of cases and postural dyspnea may be subtle which could be an early indicator for airway compromise. [1] Besides clinical evaluation, imaging such as chest and cervical x-ray may be useful to identify origin of mass and evidence of tracheobronchial compression.[1]

Objective: The advantages of elective intubation in large mediastinal mass with high suspicion of airway compromise.

Description: We describe a case of a 14 years old boy with no known medical illness presented to the emergency department with shortness of breath, facial puffiness, loss of appetite and unintentional weight loss. On physical examination, he was tachypneic and tachycardic. Lungs revealed reduced breath sounds with dullness on percussion over the right lung. Chest Xray demonstrated large homogenous opacity spanning the entire right lung with mediastinal shift to left. He was unable to proceed for CECT Thorax due to postural dyspnea and worsening respiratory distress.

Outcome: He was intubated for airway compromise and subsequent CECT thorax performed showed a huge mediastinal mass with mediastinal shift to the left, severe SVC compression and total compression of the right pulmonary artery and main bronchus with no evidence of pulmonary embolism.

Conclusion: Early preparation for elective intubation including the type of intubation and involvement of respective multidisciplinary team is crucial. Hence, the risk of sudden deterioration and mortality can be avoided.

References:
Datt V, Tempe DK, Airway Management In Patients With Mediastinal Masses, Indian Journal Of Anesthesia August 2005 Available From Https://Www.Researchgate.Net/Profile/Vishnu-Datt/Publication/285026393_Airway_Management_In_Patients_With_Mediastinal_Masses/Links/60b7b6694585154e5effacbfl/Airway-Management-In-Patients-With-Mediastinal-Masses.Pdf
Wong P, Wong J Etal, Anesthetic Management Of Acute Airway Obstruction, Singapore Medical Journal, 57(3): 110–117, March 2016 Available From: Https://Www.Ncbi.Nlm.Nih.Gov/Pmc/Articles/PMC4800720/
Dalal PG, The ‘CAN INTUBATE CANNOT VENTILATE’ Scenario in a patient with an undiagnosed anterior mediastinal mass, Penn State Hershey Medical Center, Hershey, PA, 2012 Available from: http://www2.pedsanesthesia.org/meetings/2012ia/syllabus/submissions/pblds/Table%206.pdf

The fat neck

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Introduction: Superior vena cava syndrome (SVCS) is an oncology emergency characterized by a group of symptoms due to SVC obstruction.

Case Description: A 49-year-old man presented to our emergency department with an acute onset of neck swelling. On examination, there were generalized swelling of the neck with distended veins. He experienced constitutional symptoms and chronic cough. Bedside ultrasound of the neck revealed dilated internal jugular vein with internal thrombus. Based on history, physical examination, and bedside ultrasound, a clinical diagnosis of SVC obstruction probably secondary to lung malignancy was made. CECT of neck showed presence of thrombus/tumor infiltration over SVC and right branches of the cervical veins. Histopathology showed metastatic lung carcinoma. Anticoagulation was initiated and he was arranged for chemotherapy.

Discussion: The potential for malignancy should be adequately excluded in any neck mass. Symptoms of SVCS includes facial and neck swelling, facial flushing, bilateral upper extremity swelling, neurological signs, dyspnoea, headache, and cough. Lung cancer is the primary cause of SVC obstruction in approximately 70% of patients with SVCS. Radiological findings on chest x-ray such as superior mediastinal widening and right hilar prominence that may indicate the presence of mediastinal mass. Duplex ultrasound is useful for excluding thrombus and is the initial imaging study for patients with mild symptoms. Thrombolysis and anticoagulation may be indicated for thrombosis. In cases of compression, endovascular treatment with self-expandable bare stents is an effective SVCS therapy.

Conclusion: In conclusion, clinical suspicion, radiological imaging and prompt referral are important in managing this oncologic emergency.

References:
1. Armstrong BA, Perez CA, Simpson JR, Hederman MA. Role of irradiation in the management of superior vena cava syndrome. International Journal of Radiation Oncology*Biology*Physics. 1987 Apr 1;13(4):531–9.
2. Ludman HS, Bradley PJ, editors. ABC of ear, nose and throat. John Wiley & Sons; 2012 Sep 11.
3. Nunnelee JD. Superior vena cava syndrome. Journal of Vascular Nursing. 2007 Mar 1;25(1):2–5.
4. Fagedet D, Thony F, Timsit JF, Rodiere M, Monnin-Bares V, Ferretti GR, Vesin A, Moro-Sibilot D. Endovascular treatment of malignant superior
vena cava syndrome: results and predictive factors of clinical efficacy. Cardiovascular and interventional radiology. 2013 Feb;36(1):140–9.

5. Katabathina VS, Restrepo CS, Betancourt Cuellar SL, Riascos RF, Menias CO. Imaging of oncologic emergencies: what every radiologist should know. Radiographics. 2013 Oct;33(6):1533–53.

**Setting up of emergency department: Comparative perspective between emergency departmental head with hospital administration**

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**Introduction:** The purpose of this study is to provide an outline of, as well as references concerning, the resources and planning needed to meet the emergency medical care needs of the individual and the community while setting up an Emergency with difference in perspective between the Emergency department in charge and administrative staff while doing so.

The purpose of this study is to provide an outline of, as well as references concerning, the resources and planning needed to meet the emergency medical care needs of the individual and the community while setting up an Emergency with difference in perspective between the Emergency department in charge and administrative staff while doing so.

**Description:** Often specialists from various disciplines manage the crowded casualty areas. These old casualty areas are being replaced, throughout the country by Emergency Medicine Departments (EMDs), presumed to be better planned to confront a crisis.

Setting up of Emergency Medicine department might initially seem daunting, there are a series of steps that, if we follow them, can ease the process. Current study was an attempt to perception of administration and authority of emergency department of tertiary care hospital in setting up of an emergency department.

**Method:** 20 questionnaire filled by experienced informants at hospitals across across the city of Bhubaneswar having bed >50, Odisha. The data was then analyzed.

**Outcomes:** The perspective difference between emergency in charge and administrative staff was considerably significant in many aspects. It has been discussed in details in the detailed study

**Conclusions:** In contrast to previous studies we can conclude that there have been marked improvement in awareness and perception for setting up of an Emergency Department but a lot of scope to improve still remains.

**Reference:**
K Asish and Varun Suresh. Setting up and functioning of an Emergency Medicine Department: Lessons learned from a preliminary study. Indian J Anesth. 2016 Feb; 60(2): 108–114. doi: 10.4103/0019–5049.176273

**Minor surgery under local anesthesia: Improving surgical skills for ED doctors**

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**Introduction:** There are many simple procedures that can be performed in the emergency department using Local Anesthesia (LA) instead of admitting. This has many benefits including reducing hospital admission, saving patient’s time and expedited care.

Common simple procedures include: nail bed surgery; simple hand, lip and facial lacerations; finger fractures; removal of foreign body; animal bites; abscess drainage and skin flap repair.

**Description:** The author has over 12 years experience as a Plastic Surgical Registrar at Nepean Hospital, where he has performed approximately 400 procedures under LA in the Emergency Department (ED) each year, assisted by ED RMO and Nurse practitioners.

The author was also invited to conduct workshops for PHEMC and ACRRM, many times, to share these emergency surgical skills with their trainees.

**Outcomes:** The ability of doctors in ED to perform minor surgical procedures allows for: saved hospital costs; reduced bed-lock; less referrals from peripheral to tertiary hospitals; increased patient satisfaction and care due to same day discharge.

**Conclusions:** Minor surgical procedures can be done under LA provided the doctor has acquired the necessary skills, which are relatively easy to learn. To obtain this level of competency we need to improve basic surgical skills in training. Ultimately, the goal is to provide confidence in performing minor surgery in the emergency department and GP setting.

Please see this link for tutorials on performing some minor surgical procedures, https://www.youtube.com/channel/UChNJUKwzlMiyOt09ljvDqVg

**Serious viral infections in febrile young infants**

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Serious viral infections have recently been recognized as important contributors to sepsis in young febrile infants (<90 days). The viruses that cause viremia and respiratory infections are the main pathogens in infant sepsis. However, differences in clinical characteristics between those two groups have not been fully investigated.

Objective: We aimed to compare the clinical features of infants with either of the serious viral infections, that is, viremia and respiratory infections.

Method: This study is a secondary analysis of data from a previous registry study conducted at Tokyo Metropolitan Children’s Medical Center, Japan. The patients were young febrile infants who visited the center during August 2014–September 2016. The infants with parvovirus or enterovirus infections were assigned to the viremia group, whereas those with lower respiratory infections such as those due to respiratory syncytial virus, human metapneumovirus, or influenza were assigned to the respiratory group.

Results: Of 321 young febrile infants, we identified 29 viremia and 20 respiratory infection cases. The viremia group was younger and lighter than the respiratory group (29.6 days and 3,993.6 g vs. 54.6 days and 4,976.8 g). The respiratory group had lower oxygen saturation (SpO2) than the viremia group (97.5% vs. 98.7%). Upper respiratory infection (URI) symptoms and retraction were more frequently observed in the respiratory group than in the viremia group (URI: 60.0% vs. 6.9%; chest retraction: 25.0% vs. 0%).

Conclusion: In young febrile infants, serious respiratory viral infections can be diagnosed considering URI-like symptoms, retraction, and lower SpO2. These factors may affect posterior probability.

Comparison of length of emergency department stay before and after using microarray for investigating coronavirus disease 2019: A single-center study

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Background: Microarray analysis test (Microarray) for COVID-19 was introduced at Yokohama Seibu Hospital. The previous tests were conducted at three times a day. Microarray is conducted throughout the day. However, little is known about how changing the test has affected the length of emergency department (ED) stay.

Objectives: We conducted a single-center, before–after study. Patients suspected of COVID-19 at admission to the ED were included. The research duration was divided into two periods: Pre-Microarray (from February 28 to March 27, 2021) and Post-Microarray (from March 28 to April 25, 2021).

Method: We recorded the ED stay time, and patient background data from records. Fisher’s test and the Wilcoxon signed-rank test were used for univariate analysis and generalized linear model and logistic regression analysis were used for multivariate analysis. P-value < 0.05 was considered significant.

Results: In total, 111 patients (Before, 45; After, 66) were studied. Their mean age was 76 years, and 63 of them were males. The median length of ED stay was 189 min in the Before and 167 min in the After (p = 0.16). After adjustment for age, gender, and pulse oximetry oxygen saturation/fraction of inspired oxygen, the length of ED stay was not significantly different between the two time periods studied (Coefficient; −26.8, 95% CI: −56.7–3.1; p = 0.08).

Conclusion: Our study did not demonstrate a significant change in the length of ED stay following introduction of Microarray analysis test for COVID-19.
An emergency doctor’s trek into palliative care in Vanuatu

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Introduction: When I set out to further Emergency Medicine in Vanuatu, I did not expect, as an emergency doctor, to be sharing a young woman’s journey of palliation.

Description: This is my ‘trek’ into the confronting role of treating, crying with and sharing a 28-year-old mother’s journey of dying in a country with no palliative care. I explore the cultural, gender, political and social complexities that create barriers to providing care and share my efforts to improve palliative treatment and awareness in Vanuatu. It is a story of frustration, friendship, and hope which highlights the need for more training, resources, and medical staff in Vanuatu. It sheds light on the horrific gaps in health care, made obvious by the Emergency Department being the only place for many patients to receive some attempt at ‘palliative care’.

Outcomes: My story is a trek into dying and end of life care in a country in its infancy in managing palliative care. I hope that by sharing this story, I provide a platform for discussion and action for both Vanuatu and the greater global health society to improve palliative care in Vanuatu, so that this one woman’s courageous and tragic journey is not repeated.

Conclusions: Palliative care in Vanuatu is in desperate need of improvement and this is an account of my attempt to understand how this could be achieved in a culturally appropriate and sustainable manner, told through the experience of one dying woman.

Factors associated with acute stress disorder in patients admitted to a critical care center

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ABSTRACT
**First successful intubation in emergency by the emergency team in Vanuatu**

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Introduction: In November 2021, we saved the life of a 28-year-old patient with life threatening asthma in the Emergency Department by performing the first ever Emergency Team lead intubation. This was a huge milestone for Emergency Medicine in Vanuatu.

Description: This was a big success for Emergency Department to save a life of young female patient with previous history of Tracheostomy and life-threatening Asthma, which the Anesthetic Team was expecting to be a difﬁcult intubation and asking for surgical Team to stand by for emergency tracheostomy.

Outcomes: We successfully did the ﬁrst ever Emergency Lead intubation of a patient who was going to die in Emergency department if the Emergency Team, with the confidence and support of the ACEM emergency Registrar Volunteer did not perform it.

Conclusion: Emergency Care in Vanuatu still need a lot of improvement, such as skills in advance airway management. Intubation had never been successful before, but with ACEM Volunteer Lead Team we did achieve this, and save the life of the young patient. For me and for the other registrar, who have difﬁculty attend training and postgraduate studies due to limited human resource, this was the best experience and also opened our eyes to the possibilities of future emergency care in developed countries. We have found the support of ACEM through the volunteering program invaluable.

‘You can make change happen’: Experiences of emergency medicine leadership in the Pacific

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Background: Leadership in Emergency Medicine (EM) requires complex management, relational and team-oriented skills. In Paciﬁc Island Countries (PICs) EM is a new specialty, and emergency care systems are underdeveloped. Graduating PIC EM specialists return home as sole practitioners to take on substantial leadership, clinical, teaching and advocacy tasks, yet training for leadership is limited.

Objectives: We sought to explore the activities, responsibilities, and experience of leadership from new EM doctors in PICs from an individual and Paciﬁc regional perspective.

Method: This is a qualitative study using in-depth, semi-structured interviews of invited PIC EM doctors occupying a leadership role in their countries. Data was recorded, transcribed, and triangulated with written ﬁeld notes. Inductive and deductive coding and thematic content analysis was performed in partnership with PIC co-researchers to determine overall meaning. Monash University granted ethics approval.

Results: Twelve doctors participated (11 verbal, one written response), representing six different Paciﬁc Island countries. Four key themes were identiﬁed which reﬂected both the individual agency of the Paciﬁc EM doctors and how their experience was constituted by others; professional identity and style; nurturing relationships and building solidarity; growth through experience, education and challenge; and progress and precariousness. Paciﬁc EM leaders have a strong desire for regional solidarity and networking.

Conclusion: New PIC EM doctors embrace leadership in their home countries but can feel poorly equipped and risk...
burnout. These findings can inform future targeted leadership training and contribute to building Pacific regional networks for career sustainability and specialty advancement.

**References:**
1. Wilson S, Rixon A, Hartanto S, White P, Judkins S. Systematic literature review of leadership in emergency departments. Emerg Med Australas 2020;32(6):935–52.
2. Rixon A, Wilson S, Hussain S, Terziovski M, Judkins S, White P. Leadership challenges of directors of emergency medicine: An Australasian Delphi study. Emerg Med Australas 2020;32(2):258–66.
3. Phillips G, Lee D, Shailin S, O’Reilly G, Cameron P. The Pacific Emergency Medicine Mentoring Program: A model for medical mentoring in the Pacific region. Emerg Med Australas 2019;31:1092–100.

**Concussion assessment in the emergency department: A pilot study investigating diagnostic performance of novel and recommended diagnostic tests in head-injured patients**

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**Background:** Concussion/mild traumatic brain injury (mTBI) is a common emergency department (ED) presentation. Diagnosis is limited as symptoms are non-specific and numerous. Furthermore, there are no validated objective measures. (1)

**Objectives:** To assess if the post-concussion symptom scale (PCSS), Brain Gauge (BG) somatosensory testing, and biomarkers can differentiate between head-injured patients and controls.

**Method:** Prospective pilot study conducted at Wellington Regional Hospital ED. Three groups were recruited: controls, head-injured not requiring CT (HI), and head-injured with negative CT-head (HIC). Participants completed PCSS and BG testing. PCSS is summarized by total symptom score (TS) and symptom severity score (SS). Kruskal-Wallis tests were used to compare results across groups. HI recruits completed PCSS testing weekly until 28 days post-injury to monitor recovery.

**Results:** There were 15, 21, and 12 participants per control, HI, and HIC groups respectively. Median age was 31 and 22/48 were male. Median (IQR) TS scores were 0 (0–1), 13 (4–16), and 16 (1–20) and SS scores were 0 (0–2), 27 (9–38), and 47 (24–69) respectively.

**Table 1. Medians and interquartile ranges of scores for number of symptoms, severity of symptoms and overall Brain gauge score with p values**

|                          | Controls (n = 15) | Head trauma without CT (n = 19) | Head trauma with CT (n = 11) | P value |
|--------------------------|------------------|--------------------------------|----------------------------|---------|
| PCSS – number of symptoms – median/22 (IQR) | 0 (0–1)          | 13 (4–16)                       | 16 (1–20)                   | <0.001  |
| PCSS – severity of symptoms – median/132 (IQR) | 0 (0–2)          | 27 (9–38)                       | 47 (24–69)                  | <0.001  |
| Brain gauge overall score – median/100 (IQR) | 67.5 (61–75.5)   | 63.5 (57.25–77.75)              | 59 (43–67)                  | 0.127   |

**Table 2. Percentages of head injury participants with zero number of symptoms at 2, 7, 14, and 28 days after injury**

|                      | 0 days (n = 30) | 2 days (n = 22) | 7 days (n = 15) | 14 days (n = 16) | 28 days (n = 16) |
|----------------------|----------------|----------------|----------------|------------------|------------------|
| Percentage with zero number of symptoms | 3.3            | 4.5            | 13.3           | 18.8             | 43.8             |
| Number of symptoms / 22 – median (IQR) | 13.5 (7.75–18.25) | 12.5 (8.75–19) | 10 (4–16)      | 8 (1–15.75)      | 8 (0–14.5)       |
| Symptom severity / 132 – median (IQR) | 28 (12.5–53)   | 24.5 (16.5–52.5) | 23 (4–38) | 12 (1.25–25.25) | 9.5 (0–33) |

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(24–69) for controls, HIn, and Hlc respectively (TS and SS p < 0.01). Median (IQR) BG scores were 67.5/100 (61–75.5), 63.5/100 (57.25–77.75), and 59 (43–67) for controls, HIn, and Hlc respectively (p = 0.127). After 28 days 9/16 (56%) HI had ongoing symptoms.

Conclusion: PCSS was able to discriminate head injured patients from controls and increased with more severe TBI cases. BG scores followed a similar pattern but was not significantly different between groups. This warrants further testing. Interestingly, half of HI patients had ongoing symptoms one month after injury.

Reference:
1. Pozzato I, Meares S, Kifley A, Craig A, Gillett M, Vu KV, et al. Challenges in the acute identification of mild traumatic brain injuries: Results from an emergency department surveillance study. BMJ Open. 2020;10(2).

### TABLE 1. Patient Demographics and clinical characteristics

| Variable         | Overall     | FSED (30,022) | HBED (157,797) | P-Value |
|------------------|-------------|---------------|----------------|---------|
| Age              | 45.66(20.30)| 44.67(19.42)  | 45.87(20.47)   | <0.0001 |
| Sex              |             |               |                |         |
| Female           | 117821(61.74)| 20617(62.43)  | 97204(61.60)   | 0.0165  |
| Male             | 72976(38.24)| 12402(37.56)  | 60574(38.39)   |         |
| Other            | 22(0.01)    | 3(0.01)       | 19(0.01)       |         |
| Race             |             |               |                |         |
| Black            | 59928(32.39)| 4614(14.22)   | 55314(36.26)   | <0.0001 |
| White            | 111538(60.29)| 25978(80.08) | 85560(56.08)   |         |
| Other            | 13540(7.32) | 1850(5.70)    | 11690(7.66)    |         |
| Ethnicity        |             |               |                |         |
| Hispanic         | 12296(6.55) | 911(2.82)     | 11385(7.33)    | <0.0001 |
| Not Hispanic     | 175309(93.45)| 31363(97.18)  | 143946(92.67)  |         |
| Insurance        |             |               |                |         |
| Medicaid         | 59183(35.13)| 8176(26.64)   | 51007(37.02)   | <0.0001 |
| Medicare         | 40529(24.06)| 6141(20.01)   | 34388(24.96)   |         |
| Private          | 68561(40.69)| 16316(53.16)  | 52245(37.92)   |         |
| Self-Pay         | 208(0.12)   | 60(0.20)      | 148(0.11)      |         |
| ESI Level        |             |               |                |         |
| High             | 33224(17.41)| 2500(7.57)    | 30724(19.47)   | <0.0001 |
| Low              | 4197(2.20)  | 782(2.37)     | 3415(2.16)     |         |
| Moderate         | 153358(80.39)| 29735(90.06) | 123623(78.36)  |         |
| CCI              | 2.55(3.58)  | 2.00(3.13)    | 2.67(3.66)     | <0.0001 |
| Chief Complaint  |             |               |                |         |
| ABDOMINAL PAIN   | 97434(51.06)| 16967(51.38)  | 80467(50.99)   | <0.0001 |
| Chest PAIN       | 67084(35.16)| 11083(33.56)  | 56001(35.49)   |         |
| Headache         | 26301(13.78)| 4972(15.06)   | 21329(13.52)   |         |
| ED Disposition   |             |               |                |         |
| Admitted         | 57011(29.88)| 7482(22.66)   | 49529(31.39)   | <0.0001 |
| discharged       | 126550(66.32)| 24917(75.46)  | 101633(64.41)  |         |
| other            | 7258(3.80)  | 623(1.89)     | 6635(4.20)     |         |
| CT scan          |             |               |                |         |
| No               | 107426(56.30)| 18051(54.66)  | 89375(56.64)   | <0.0001 |
| Yes              | 83393(43.70)| 14971(45.34)  | 68422(43.36)   |         |
more frequently at freestanding (FED) vs. hospital-based EDs (HBED).

Methods: This was a retrospective cohort study of all patients who presented to one of 16 EDs (10 hospital-based; 6 freestanding) in a large integrated hospital system between May 1, 2019 – April 30, 2021. Categorical variables are presented as frequencies and percentages. Continuous variables presented as mean and standard deviation. Multiple logistic regression was used to assess the effect of ED type on CT utilization with adjusted odds ratio and 95% confidence intervals.

Results: In total, 190,819 patients were included. After controlling for Charlson comorbidity index, acuity, race, gender, and insurance, patients presenting to a FED with headache were 13% more likely to have a CT scan performed AOR 1.13(1.05–1.22). Patients presenting to a FED for chest pain were 20% more likely to have a CT scan performed AOR 1.20(1.13–1.26). Patients presenting to a FED for abdominal pain were 16% less likely to have a CT scan performed AOR 0.84(0.81–0.87). All differences were significant (p < 0.001).

Conclusion: FEDs were more likely to have utilized CT for patients presenting with headache and chest pain, and less likely to have utilized CT for patients presenting with abdominal pain.

Emergency department to emergency department transfers: What happens to these patients?

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Background: When emergency department (ED) patients require a higher level of care, transferring patients for specialized services to another ED may be needed. Previous studies have characterized risks and cost factors involved with transfers; however, few have evaluated appropriateness of transfers. The objective of this study was to determine if a specialty consultation or admission was required for ED-to-ED transfers.

Methods: This was a retrospective cohort of all adult patients who presented to one of 16 EDs within a large integrated health system between January 1, 2018 and December 31, 2020 and were transferred to another ED within the hospital system. Categorical variables are presented as frequencies and percentages. Continuous variables are presented as mean and standard deviations or median and quartiles depending on distribution. Multiple logistic regression was utilized to determine if variables collected were predictive of hospital admission.

Results: A total of 4,733 encounters were included in the study. At the transfer ED, 58.3% (n = 2762) received a specialty consult and 51.7% (n = 2445) were admitted to inpatient services within the facility. A total of 1,970 (41.7%) patients did not receive a specialty consult and were discharged to home from the ED. The top three body systems requiring transfer were GI and endocrine (18.4%), musculoskeletal (13.69%) and genitourinary (12.36%).

Conclusion: Over half of all ED-to-ED transfers involved a specialty consultation and over half of patients transferred were admitted to the hospital. A large number of patients did not receive a specialty consultation and were discharged from the ED.

| Variable                  | Frequency or Median | Percent or Q1 – Q3 |
|---------------------------|---------------------|-------------------|
| Age                       | 42                  | 30 - 55           |
| Gender                    | 2244                | 47.41%            |
| Female                    | 2489                | 52.59%            |
| Male                      |                     |                   |
| Race                      | 3285                | 69.41%            |
| White                     | 1125                | 23.77%            |
| Black                     | 166                 | 3.51%             |
| Multiracial/Multicultural | 96                  | 2.03%             |
| Unknown                   | 15                  | 0.32%             |
| Asian                     | 9                   | 0.19%             |
| Other                     |                     |                   |
| American Indian/Alaska    |                     |                   |
| Native                    |                     |                   |
| Insurance                 | 2301                | 48.62%            |
| Private                   | 1263                | 26.68%            |
| Medicaid                  | 718                 | 15.17%            |
| Self                      | 420                 | 8.87%             |
| Medicare                  | 31                  | 0.65%             |
| Other                     |                     |                   |
| Acuity Category           | 537                 | 11.35%            |
| Low (ESI 4 or 5)          | 3471                | 73.34%            |
| Middle (ESI 3)            | 725                 | 15.32%            |
| High (ESI 1 or 2)         |                     |                   |
| Means of Arrival to first ED | 3727              | 78.74%            |
| Private                   | 1006                | 21.26%            |
| EMS                       |                     |                   |
| Consult                   | 1971                | 41.64%            |
| No                        | 2762                | 58.36%            |
| Yes                       |                     |                   |
| Number of consults        | 1                   | 1 - 2             |
| First Emergency           | 2663                | 56.26%            |
| Department visit          | 2070                | 43.74%            |
| facility type             |                     |                   |
| FSED                      |                     |                   |
| HBED                      |                     |                   |

ESI – Emergency Severity Index score; ED – Emergency Department; FSED – Freestanding Emergency Department; HBED – Hospital-based Emergency Department

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Patients utilizing emergency medical services: Does emergency department facility type matter?
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Background:
Emergency departments (EDs) play a critical role in the United States healthcare system. As freestanding EDs (FEDs) are integrated into the acute care landscape, local EMS providers are transporting to these facilities which may be closer in proximity and provide faster turn-around times. Our objective was to compare testing frequency and admission rates between patients transported via EMS to a FED vs a hospital-based ED (HBED).

Methods:
This was a retrospective cohort study of all patients who presented within a large hospital system via EMS to one of 10 HBEDs or one of 6 FEDs between April 1, 2020 – May 1, 2021. Categorical variables are presented as frequencies and percentages. Continuous variables presented as mean and standard deviation. Multiple logistic regression was used to assess the effect of ED type on admission status.

Results: A total of 123,120 encounters were included. At the FED, 69.5% (n = 5846) had bloodwork vs. 82.4% (n = 94,512) at the HBED; 68.3% (n = 5745) had an x-ray at the FED vs. 70.7% (n = 81089) at the HBED; 40.1% (n = 3370) had a CT scan at the FED vs. 44.9% (n = 51,503) at the HBED; and 40.6% (n = 3412) were admitted at the FED vs. 56.1% (n = 64,355) at the HBED. Patients in FSEDs were 35% less likely to be admitted compared to patients in HBEDs (p < 0.001).

Conclusion: Patients brought in via EMS to a FED were less likely to have blood work, x-ray, or CT scan and were less likely to be admitted to the hospital than those transported to a HBED.

Lessons learned from opportunistic COVID-19 vaccination in the ED and the value of social emergency medicine
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| Variable | Overall | FSED (n = 8,408) | HBED (n = 114,712) | p-value |
|----------|---------|-----------------|------------------|---------|
| Age      | 61.18 (20.52) | 59.90 (21.69) | 61.28 (20.43) | <0.0001 |
| Sex      | 65484 (53.20) | 4675 (55.61) | 60809 (53.02) | <0.0001 |
| Female   | 57609 (46.80) | 3732 (44.39) | 53877 (46.98) |       |
| Male     |          |                 |                  |         |
| Race     | 40742 (33.66) | 1123 (13.52) | 39619 (35.14) | <0.0001 |
| Black    | 75235 (62.15) | 6805 (81.95) | 68430 (60.70) |       |
| White    | 5070 (4.19) | 376 (4.53) | 4694 (4.16) |       |
| Other    |          |                 |                  |         |
| Ethnicity| 4766 (3.95) | 214 (2.61) | 4552 (4.05) | <0.0001 |
| Hispanic | 115857 (96.05) | 7995 (97.39) | 107862 (95.95) |       |
| Not Hispanic |          |                 |                  |         |
| Payor    | 59346 (50.82) | 3974 (49.97) | 55372 (50.89) | <0.0001 |
| Medicare | 31040 (26.58) | 1759 (22.12) | 29281 (26.91) |       |
| Medicaid | 26383 (22.59) | 2220 (27.91) | 24163 (22.21) |       |
| Private  |          |                 |                  |         |

| Variable | Overall | FSED | HBED | p-value |
|----------|---------|------|------|---------|
| Charlson Comorbidity Index | 4.75 (4.48) | 4.05 (4.18) | 4.80 (4.49) | <0.0001 |
| ED LOS (hours) | 5.17 (4.49) | 3.72 (2.34) | 5.27 (4.59) | <0.0001 |
| Acuity | 39639 (32.49) | 1234 (14.78) | 38405 (33.79) | <0.0001 |
| High (ESI 1 or 2) | 76095 (62.37) | 6350 (76.04) | 69745 (61.37) |       |
| Medium (ESI 3) | 6263 (5.13) | 767 (9.18) | 5496 (4.84) |       |
| Low (ESI 4 or 5) |          |      |      |         |
Background: Throughout the COVID-19 pandemic, vulnerable and unvaccinated people have continued to attend Emergency Departments in Melbourne, Australia. Our ED treats a high volume of people with social vulnerabilities, many of which impeded their ability to access vaccination and predisposed this population to an increased risk of virus acquisition as well as an adverse outcome with COVID-19. As of September 2021, only 47% of our 400 most frequent ED attenders had received a first vaccine compared to 69% of the Victorian population.

Objectives: In an effort to facilitate vaccine equity and minimize hospitalization and death, we implemented an opportunistic COVID-19 vaccination program in our ED at St Vincent’s Hospital Melbourne.

Description: Program implementation involved a multi-disciplinary effort between ED clinicians, pharmacy, hospital management, and the nearby vaccination center. Daily vaccinations were administered by dedicated nurses.

Outcomes: Very few eligible patients declined opportunistic vaccination, instead describing competing social priorities or technological barriers to accessing vaccination sooner. Together with our hospital’s mobile vaccination team, hundreds of vaccines have been opportunistically administered to marginalized people in Melbourne.

Conclusions: The unequivocal success of opportunistic Covid-19 vaccination re-emphasizes the value of opportunistic interventions and harm reduction measures in the ED and necessity of Social Emergency Medicine as a subspecialty.

Reference:
Simons, S.N., Hutton, J., Walker, K. and Harding, S. (2022), Opportunistic COVID-19 vaccination in the emergency department. Emergency Medicine Australasia, 34: 138–140. https://doi.org/10.1111/1742-6723.13883

Wasp sting envenomation with multi organ failure
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Introduction: Wasps belonging to the family vespidae is one of the dangerous hymenopteran when disturbed in its habitat either accidentally or purposely. Wasp stings are common, especially in populations living in vicinity to forested areas all over the world. Local signs following stings are common and generally life threatening anaphylaxis may occur, including Kounis syndrome requiring immediate treatment. Wasp sting causing multi organ dysfunction is uncommon and carries worst prognosis. This case report is of 55 year old male bitten by a swarm of wasps leading to sepsis and acute kidney injury due to envenomation and related complications.

Case Description: A 55 year old male named sowdaranjan came to the hospital with complaints of stung by a swarm of wasps (more than 50) in his farm field, within minutes he developed severe local erythema and oedema followed by dizziness, diaphoresis and sudden loss of consciousness. Directly he was brought to the ER department. Patient was conscious, oriented, afebrile. Vitals are stable BP; 110/70 mmhg PR; 90 bpm SPO2 96% @ room air. Patient was treated conservatively with INJ HYDROCORTISONE, INJ AVIL, INJ TETANUS TOXOID and EPINEPHRINE subcutaneously as anaphylactic treatment. IN the ER his level of consciousness fluctuated between responsive to sudden LOC and interruption of speech. GCS during those episodes with LOC was E4M1V1. There were no signs of motor abnormalities. Patient was given inj clonazepam 1 mg IV during the episodes of LOC thinking of status epilepticus. Patient suddenly developed tachypnoea with desaturation Spo2 83 in room air, a chest radiograph showed bilateral diffuse lung infiltration. He was subsequently diagnosed with acute respiratory distress syndrome. IN view of ARDS patient was intubated. Lab investigations done in ER LDH 5000IU/L, PT-INR 1.4, URINE MYOGLOBIN NEGATIVE. TOTAL WBC COUNT 22000 CELLS/MM, SODIUM 135 meq/l, POTASSIUM 5.9 meq/l. 2D ECHO EF 60%, SERUM CREATININE 4MG/DL AND LIVER FUNCTION TEST (total bilirubin 22.9 mg/dl, serum glutamic pyruvic transaminase 7200 U/L, serum glutamic oxaloacetic transaminase 2700 U/L ) CREATININE PHOSPHOKINASE 15000 U/L . URINE ROUTINE -GRANULAR CASTS (features suggestive of acute tubular necrosis). CT brain and MRI brain shows normal study. He received N-ACETYLCYSTEINE infusion for rearranged liver functions. In view of sepsis patient was started on iv INJ AUGMENTIN. Patient renal parameters, liver enzymes, Cr total and LDH are grossly elevated. Post admission nil urine output and icterus was present. In view of acute renal failure due to rhabdomyolysis, patient was taken for emergency dialysis.

Conclusion: Wasp venom is a mixture of biogenic amines such as melittin, apamine, phospholipase, hyaluronidase, acid phosphatase, histamine and kinin. Rhabdomyolysis due to direct toxic effect of venom and muscular tissue could have been the possible cause of acute renal failure and liver failure due to liver ischemia because of toxins and hemolysis which is a rare complication.

Prevention: The wasp become aggressive when disturbed so in a warm humid weather one has to be cautious when outdoors. They are attracted to bright colors, sweets, alcohol, and perfumes so all this should be avoided when venturing in forested areas. Trying to kill one of them will be dangerous as the pheromones released will attract the whole swarm. So one has to stay calm if acicently close to a colony and move away slowly as wasp do not attack beyond their area.

Surviving the lightning– A case report on multi organ injuries post lightning strike
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1
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1
Introduction: In India, every third death due to natural hazards is due to lightning. A lightning strike injury is a rare presentation to the emergency department which carries a risk of dramatic medical complications to multiple organ systems and a high risk of fatality.

Description: Herein reporting a case of lightning strike (probably struck indirectly by a side flash from the nearby tree) a 32 years male with history of loss of consciousness, one episode of possible seizure, right ear bleed and burns over the body. In primary survey he was resuscitated according to ATLS protocol, parkland formula and other supportive care. He underwent Trauma CT which showed petechial hemorrhage in the right basal ganglia and left frontal lobe. His electrocardiogram showing QTc prolongation and elevated cardiac enzymes suggestive of myocarditis and rapid increase of Creatine phosphokinase level with altered renal parameters suggestive of rhabdomyolysis. He was treated symptomatically and with mechanical ventilator support for respiratory distress. Later he developed quadriparesis along with neck and respiratory muscle weakness and tracheostomy done due to prolonged ventilator support. His condition gradually improved and discharged home in a stable condition after decannulation.

Conclusions: Many of the manifestations did not even have a clear pathogenesis documented and treatment is mostly symptomatic, supportive and early identification to prevent any complications is the key. Multidisciplinary approach from wide specialties working as a team is always a key for the survival of such patients.

Human immunodeficiency virus pre-exposure prophylaxis perspectives in a Kenya emergency department
Janet Sugut

Background: HIV Pre-exposure prophylaxis (PrEP) has been shown to be effective in preventing HIV infection and Emergency Departments (ED) may represent avenues for delivery of PrEP to persons that do not otherwise access healthcare in Africa where global HIV burdens are the greatest.

Objectives: To assess knowledge and acceptability of HIV PrEP among patients and relatives in the ED. Determine acceptability of HIV PrEP among patients and relatives in the ED

Methods: This cross-sectional study randomly sampled persons in an ED using a semi-structured questionnaire given to 384 participants, of which 192 were patients and 192 were family members. Descriptive statistics were used to analyze data. Multivariate logistic regression was completed to assess for factors associated with acceptance of PrEP among patients and family members.

Results: The majority of respondents, 59.9% (n = 230) were aged 30–49 years. 62% of respondents stated that they had heard of PrEP and 5.3% (n = 11) had reported using PrEP. The most common sources of information were through radio 37.6% and friends 26.9%. 58.9% (n = 226) of respondents correctly defined PrEP. Among respondents 58.1 % stated they would be willing to access PrEP from an ED. There was increased association of PrEP acceptability among those with a tertiary level of education (aOR = 1.68, 95% CI: 0.99–2.82; p = 0.005) and for those with knowledge of PrEP, p = 0.011, (aOR = 2.54, 95% CI; 0.33 – 4.86, p = 0.011).

Conclusions: These data suggest that ED-based PrEP delivery may represent an adjunctive approach to increase coverage in HIV prevention.

Prehospital emergency use of laryngeal mask airway among ambulance personnel: The role of training
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| TABLE 1. Procedure outcome (N = 35) |
|-------------------------------------|
| Attempt | Success | Failure | P value |
|---------|---------|---------|---------|
| Attempt 1 | 35 (100%) | 0 (0%) | (baseline) |
| Attempt 2 | 34 (97%) | 1 (3%) | 0.317 |
| Attempt 3 | 35 (100%) | 0 (0%) | 0 |

Procedure time (in seconds) Mean (SD) Mean difference (SD) P value

| Attempt | Procedure time |
|---------|----------------|
| Attempt 1 | 13.79 (5.19) (baseline) |
| Attempt 2† | 11.41 (3.06) 2.38 (4.54) 0.003 |
| Attempt 3 | 10.09 (2.65) 3.69 (4.58) 0.005 |

†We excluded one participant who failed the second attempt to evaluate the time difference in each attempt

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Background: Ambulance personnel in Indonesia are nurses. Intubation is a physician competence due to its invasiveness. Since Laryngeal Mask Airway (LMA) is a non-invasive airway device, it is becoming a promising option in pre-hospital airway management.

Objectives: In this study, we investigated LMA insertion success rate and the role of training in ambulance personnel’s knowledge, self-assessment, self-confidence, and preference of using LMA.

Method: Thirty-five ambulance personnel were first given a pre-training quiz and questionnaire. After that, they were given a training session by experienced medical trainers, followed by demonstrations of direct LMA insertion to manikins. Each subject tried the procedure three times. At each attempt, we recorded the outcome whether it is a success or a failure, and the time required to achieve success. In the end, the subjects were given a post-training quiz and questionnaire.

Results: Knowledge, self-assessment, self-confidence, and preference of using LMA among subjects are significantly increased pre and post-training (P < 0.001). Only one subject failed the insertion at the second attempt.

Conclusion: Both knowledge (self-assessment, self-confidence and preference) and skill of LMA insertion can be acquired through training.

References:
1. Bosch J, de Nooij J, de Visser M, Cannegieter SC, Terpstra NJ, Heringhaus C, et al. Prehospital use in emergency patients of a laryngeal mask airway by ambulance paramedics is a safe and effective alternative for endotracheal intubation. Emerg Med J EMJ. 2014 Sep;31(9):750–3
2. Laiou E, Clutton-Brock TH, Lilford RJ, Taylor CA. The effects of laryngeal mask airway passage simulation training on the acquisition of undergraduate clinical skills: a randomized controlled trial. BMC Med Educ. 2011 Dec;11(1):1–10.

“Is there any sticker given by the doctor?” A case report of unintentional Fentanyl transdermal overdosing

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Introduction: Fentanyl is a potent pure mu-opioid receptor that has lipid and aqueous compartment solubility. Its property allows it to penetrate skin hence transdermal preparation provides an alternative for pain management.

Description: We had a female patient, 44 years old admitted to the emergency department with decreased consciousness for 6 h. She appeared like a dead on arrival case with cyanotic, bradypnea, tachycardic-strong pulse was palpable. Oxygen level (SpO2) was 58% on room air and normal blood pressure. Pupils were miosis.

She was manually ventilated with a bag valve mask with 100% oxygen. The husband confirmed that she applied a sticker on her right thigh early this morning as prescribed by her doctor for her cervical cancer. She usually takes Mefenamic acid as pain relief. The sticker was removed and it was a 50 micrograms (mcg) Fentanyl patch. Low dose intravenous naloxone was administered 0.08 milligrams (mg) and repeated every 3–5 min according to clinical response.

Outcomes: Patient condition improved and in stable condition after naloxone 0.24 mg. She was still sedated but breathing spontaneously using a non-rebreathing mask 10 L/minute and SpO2 99%. The total dose of 1.5 mg naloxone was given due to a shallow breathing pattern. She was admitted to the ward for observation and further workup. She was discharged uneventfully.

Conclusions: Specific questions using the patient’s words such as “stickers” may provide us with the substance cause of overdose. Low dose titrating naloxone is a treatment option for opioid overdose. A better understanding of pharmacokinetic and titrating opioid doses for outpatient is important for physicians.

References:
1. Nelson, L, Schwaner, R. Transdermal fentanyl: Pharmacology and toxicology. J. Med. Toxicol. 5, 230 (2009). https://doi.org/10.1007/BF03178274.
2. Li K, Armenian P, Mason J, Grock A. Narcan or Nar-can’t: Tips and Tricks to Safely Reversing Opioid Toxicity. Ann Emerg Med. 2018;72(1):9–11. doi:10.1016/j.annemergmed.2018.05.010

Advanced training in emergency medicine for pharmacists

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Introduction: The Princess Alexandra Hospital (PAH) has commenced an advanced training residency (ATR) program for Pharmacists specializing in Emergency medicine (EM). The two-year residency is bespoke for individual pharmacists, providing a structured, formalized, and nationally accredited training program.

Description: The ATR program at the PAH provides the opportunity for pharmacists with three to five years experience to develop clinical skills and knowledge in a chosen specialty. It is comprised of 18 months in a specialty field with an additional six-month elective rotation. The PAH ATR for EM has been developed by pharmacists with input from Emergency Physicians and Clinical Toxicologists, and is accredited by the Society of Hospital Pharmacists Australia. This program includes a 20-week toxicology course covering toxicological principals, deliberate self-poisoning and recreational exposures. The ATR program develops leadership skills through facilitating CPD, supervision and training of pharmacists, and performing peer assessment. In addition, the ATR fosters communication and engagement skills by sitting on medication management committees and collaborating to complete a multidisciplinary...
research project. There are currently three hospitals in Australia with an approved EM ATR program. **Outcomes:** Studies have shown the presence of an experienced pharmacist in the Emergency department can lead to a reduction in hospital admissions and medication errors1,2. Through the provision of specialized in-house training, the ATR will aim to improve clinical outcomes for patients in a tertiary-level Emergency department. **Conclusions:** The EM ATR enables specialty trained pharmacists to apply theory to clinical practice under the mentorship of an experienced EM pharmacist, physicians, and Toxicologists to improve patient outcomes and develop into the future leaders in their field. **References:**

1. Briggs, S., Pearce, R., Dilworth, S., Higgins, I., Hullick, C. and Attia, J., 2015. Clinical pharmacist review: A randomized controlled trial. Emergency Medicine Australasia, 27(5), pp.419–426.
2. Brown, J., Barnes, C., Beasley, B., Cisneros, R., Pound, M. and Herring, C., 2008. Effect of pharmacists on medication errors in an emergency department. American Journal of Health-System Pharmacy, 65(4), pp.330–333.

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**Teething problems: A case of fulminant cervical necrotising fasciitis (CNF) with extensive chest wall involvement**

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**Introduction:** CNF is uncommon and carries a high mortality rate1. CNF typically originates from odontogenic infections which has a high propensity to spread rapidly to the mediastinum and chest wall2. It is vital to differentiate CNF with Ludwig’s angina and neck abscesses as delay in diagnosis and aggressive treatment would lead to poor patient outcomes. We report a case of a young patient with fulminant CNF who presented late to our emergency department.

**Description:** A 26-year-old male without co-morbidities presented with a preceding history of toothache for a week, followed by left neck swelling, fever with chills and rigors. He had visited his primary care provider prior for similar complaints and started on a course of oral antibiotics. He appeared toxic with poor oral hygiene. Clinical examination revealed a left tender neck swelling and crepitus over his anterior neck extending to the lower chest wall. He required intubation in view of airway compromise. A contrasted CT head, neck, and thorax revealed a left periodontal abscess with features of CNF and descending necrotizing mediastinitis (DNM).

**Outcomes:** Despite broad spectrum antibiotics, ICU care and extensive surgical debridement, the patient subsequently succumbed to complications of extensive CNF.

**Conclusions:** A high degree of clinical suspicion is warranted to detect CNF especially in a toxic appearing patient1. Absence of crepitus on examination do not rule out CNF and skin changes often underestimates the severity of the underlying infection2,3. Therefore, patients with dental infections and neck pain should be thoroughly evaluated for potential features of dangerous soft tissue infections.

**References:**

1. Shaariyah, M. M., Marina, M. B., Mohd Razif, M. Y., Mazita, A., & Primuharsa Putra, S. H. (2010). Necrotizing fasciitis of the head and neck: surgical outcomes in three cases. The Malaysian Journal of Medical Sciences: MJMS, 17(2), 51–55.
2. Cecchini, A., Cox, C. J., Cecchini, A. A., Solanki, K., & McSharry, R. (2021). Odontogenic Infection Complicated by Cervicofacial Necrotizing Fasciitis in a Healthy Young Female. Cureus, 13(8), e16835.
3. Holtmann H, Lommen J, Sander K, Kubler NR, Langie R. (2018). Odontogenic cervical necrotizing fasciitis and descending necrotizing mediastinitis in a diabetic patient: literature review and report of a rare and fatal case. World J Oral Maxillofac Surg 1 (1):1–4.

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**Localized crepitus with a line over the right flank–Klebsiella pneumoniae emphyzematous pyelonephritis in emergency department**

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**Background:** Klebsiella pneumoniae emphyzematous pyelonephritis is a rare case to encounter in Emergency Department. It is a life-threatening, necrotizing, fulminant infection associated with gas formation within the kidney.

**Objective:** Early detection with clinical examination, imaging, followed by empirical antibiotic, and surgical intervention is lifesaving for this critical illness.

**Description:** A 62 years old gentleman with underlying benign prostate hyperplasia and newly diagnosed diabetes presented with generalized abdominal pain with distention and shortness of breath. The patient was hemodynamically unstable upon arrival. Abdominal examination revealed tenderness over the right flank region, extended to right upper quadrant and suprapubic. Right kidney was enlarged and ballotable with presence of localized subcutaneous emphysema. Bedside sonography showed abdominal A-line at right flank region, suggesting intra peritoneal air.3,4 Lab investigation showed leukocytosis with white cell count of 70.0 x 10³/µl, a C-reactive protein level of 248.1 mg/L, with deranged kidney and liver function, and coagulopathy due to sepsis.

**Outcome:** Empirical intravenous meropenem was administered. Computed Tomography (CT) renal 4 phase showed right emphyzematous pyelonephritis with multi-loculated retro/extrapelvical collection and air locules, emphyzematous osteomyelitis, and pneumorrhacis. CT guided pigtail insertion was done, which later on yields Klebsiella pneumoniae. Patient was admitted to Intensive
Care Unit and subsequently right nephrectomy was performed by Urology team. Patient was discharged well after 53 days of treatment.

**Conclusion:** Early detection of life-threatening condition, empirical intravenous antibiotic, and necessary intervention for source control involving multidisciplinary team is paramount to reduce morbidity and mortality in emphysematous pyelonephritis.

**References:**
1. Lu YC, Chiang BJ, Pong YH, Chen CH, Pu YS, Hsueh PR. Emphysematous pyelonephritis: Clinical characteristics and prognostic factors. Int J Urol. 2013 Aug 22.
2. Roy C, Pfleger DD, Tuchmann CM, et al. Emphysematous pyelitis: findings in five patients. Radiology. 2001 Mar. 218(3):647–50.
3. Craig WD, Wagner BJ, Travis MD. Pyelonephritis: radiologic-pathologic review. Radiographics. 2008 Jan–Feb. 28(1):255–77.
4. Chen CY, Chen CJ. Images in clinical medicine. Emphysematous pyelonephritis. N Engl J Med. 2014 Nov 27. 371 (22):e34.
5. Chen SC, Wang HP, Chen WJ et al (2002) Selective
6. Jones R (2007) Recognition of pneumoperitoneum

**Predictors of outcome among patient diagnosed with COVID-19 in the emergency department of philippine general hospital: A retrospective review**

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**Background:** Coronavirus Disease 2019 (COVID-19) attracted worldwide attention as an international public health emergency as the first pandemic brought by a coronavirus. In this current pandemic, disease diagnosis is essential for optimal management and timely isolation of infected cases to prevent further spread.

**Objectives:** This study determined the predictors of in-hospital mortality and survival among patients diagnosed with COVID-19 at the Emergency Department of Philippine General Hospital from March 23, 2020, to May 31, 2020

**Method:** This retrospective cohort study was conducted through a medical record review aimed to determine the predictors of in-hospital mortality and survival of COVID-19 confirmed cases in the Emergency Department of the National University Hospital. Data gathered from the medical charts of patients included in the study were the demographic profile, clinical profile, diagnostic profile, therapeutic interventions. The relationship between each variable and the risk of death in COVID-19 confirmed patients was investigated using univariate and multivariate logistic regression.

**Results:** A total of 82 patients with COVID-19 confirmed (46 male and 36 female) were included in the study of whom 16 died. Univariate and multivariate logistic regression analysis revealed that respiratory higher rate (OR 1.34, 95% CI 1.04–1.80; p = 0.02), need for invasive mechanical ventilation (OR 31.7, 95% CI 1.74–1.105; p = 0.02) and vasopressors (OR 890, 95% CI 16.2–84.970; p = 0.01) were associated with an increased risk of mortality from COVID-19.

**Conclusion:** The researchers identified three risk factors and predictors of outcome among COVID-19 patients admitted in the ED: higher respiratory rate, need for invasive mechanical ventilation and vaspressors. These factors can help clinicians prognosticate and should be considered in management strategies.

**References:**
- Cheng, Y., Ran, L., Kun, W., Meng, Z., Zhixiang, W., Lei, D., Gang, X. (2020). Kidney disease is associated with in-hospital death of patients with COVID-19. *Kidney International*. Department of Health. (2020, March 16). Algorithm for Triage of Patients with Possible COVID-19 Infection in Health Care Facilities. Manila, Philippines. Department of Health. (2020). COVID-19 Situation Report. Geneva, Switzerland: World Health Organization.

Rocuronium dosing >1.5 mg/kg rather than ≤1.5 mg/kg reduces the occurrence of inadequate paralysis in prehospital and retrieval intubations: A retrospective study

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**Background:** Greater Sydney Area Helicopter Emergency Medical Service increased rocuronium dosing for rapid sequence intubations (RSI) from 1.5 mg/kg to 2.0 mg/kg in response to the number of inadequately paralyzed patients identified by an airway audit in 2017. One paper proposed increased excellent intubation conditions with higher dosing (1).
TABLE 2. Rocuronium dose given mean (s.d), no. inadequately paralyzed at laryngoscopy; and Cormack-Lehane grade I-II n(%). NS = not statistically significant

| Rocuronium     | Dose administered | Inadequately paralyzed | Grade I-II |
|----------------|-------------------|------------------------|------------|
| mg/kg n = 211  |                   |                        |            |
| ≤ 1.5          | 1.3 (0.2)         | 5/211 (2.37%)          | 187 (88.6%)|
| mg/kg n = 384  |                   | 2/384 (0.52%)          | 355 (92.4%)|

Objectives: We investigated whether doses over 1.5 mg/kg rocuronium reduced the incidence of inadequately paralyzed patients.

Method: Retrospective review of caserecords from 2017 and 2018 identifying all rocuronium RSI. Rocuronium dose, estimated weight, and laryngoscopy grade were extracted. Primary outcome was casenote description of skeletal muscle activity at laryngoscopy. Patients with extravasated vascular access were excluded.

Results: Demographics from 595 cases identified 70% male, mean age 44, 6% children, 71% prehospital, 67% trauma. See main results in Table 1. The low event rate is not suitable for statistical analysis.

Conclusion: This study suggests that doses >1.5 mg/kg rocuronium may be associated with fewer inadequately paralyzed patients at laryngoscopy than ≤1.5 mg/kg. Prospective studies on rocuronium dose for RSI are warranted.

Reference
1. Heier T, Caldwell J. Rapid Tracheal Intubation with Large-Dose Rocuronium: A Probability-Based Approach. *Anesthesia and Analgesia*. 2000;90:175–9.

The fatal case of a hydrophobic swimmer

Yen Yen Thien, Aaron Kuo Hoo Lai

Introduction: Rabies is a deadly neurological infectious disease with a mortality rate close to 100%. Rabies classically manifests with two distinct phenotypes: furious and paralytic rabies. We report a confirmed case of rabies presenting with both phenotypes.

Description: A young male swimmer was initially referred to our center for suspected Guillain-Barré syndrome (GBS). He had an initial history of fall followed by low back pain and bilateral lower limb weakness. Examination revealed lower motor neuron flaccid paralysis. MRI spine demonstrated a L5/S1 disc desiccation with annular tear without cord compression. Further history revealed a history of a superficial dog scratch two months prior to presentation by his adopted dog. The unvaccinated dog was rabid prior to death. He did not seek medical attention for the wound. The patient had clinical features of both encephalitic and paralytic rabies evident by presence of hydrophobia, aerophobia, hyper-salivation, confusion with progressively worsening ascending weakness of bilateral upper and lower limbs and areflexia. Cerebrospinal fluid (CSF) examination revealed elevated lymphocytes and proteins. An MRI brain did not show typical features suggestive of rabies.

Outcomes: The patient was intubated and mechanically ventilated in view of respiratory failure. A nuchal skin biopsy for rabies virus polymerase chain reaction (PCR) confirmed the diagnosis of rabies. Unfortunately, there is no effective treatment for rabies besides supportive care. Patient rapidly deteriorated and succumbed due to cardiopulmonary failure two days later.

Conclusions: A high clinical suspicion for rabies is crucial in patients presenting with encephalitis and ascending weakness in epidemic areas.

Reference
Sim BNH, Liang BNW, Ning WS, Viswanathan S. A retrospective analysis of emerging rabies: a neglected tropical disease in Sarawak, Malaysia. *J R Coll Physicians Edinb*. 2021 Jun;51(2): 133 – 139.

TramaDON’T!: A case of tramadol-induced seizure

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Introduction: Tramadol is a synthetic, centrally-acting analgesic that is believed to work through modulation of the central nervous, noradrenergic, and serotonergic systems. It is commonly used to treat moderate to severe pain. Tramadol has been previously reported to lower the seizure threshold when co-administered with other drugs.

Description: We report a case of a 19-year-old non-hypertensive, non-diabetic female, with no history of epilepsy who consulted at the emergency department for recurrent burning epigastric pain for 4 days with frequent episodes of belching. At the Emergency Department, a working impression of Acid-Related Disease was given. She was given 1 dose of Tramadol 50 mg via slow IV push which afforded relief. After resting for several minutes, the patient suddenly went into generalized, tonic-clonic seizures. Diazepam 5 mg/IV was then given which terminated the seizures.

Outcomes: The patient was subsequently admitted for observation and work-up including a video electroencephalography which revealed unremarkable results. Patient was discharged improved after 3 days without seizure recurrence. Final Diagnosis was Gastroesophageal Reflux Disease and Tonic-Clonic Seizures, Drug-Induced.
Conclusion: Tramadol-Induced Seizures is a diagnosis of exclusion, with its exact mechanism still unclear. Treatment follows the same management as epilepsy. Benzodiazepines as first-line medications are effective in controlling the seizures as evidenced by our case. Careful review of a patient’s history, co-morbidities, and maintenance medications should be done before administering Tramadol, in order to prevent interactions with any of the medications that can lower the seizure threshold.

References:
1. Hitchings, A. W. (2016). Drugs that lower the seizure threshold. Adverse Drug Reaction Bulletin, 298(1), 1151–1154. https://doi.org/10.1097/fad.0000000000000016
2. Mehrpour, M. (2005, November 10). Intravenous tramadol-induced seizure: Two case reports. Iranian Journal of Pharmacology and Therapeutics. Retrieved December 2, 2021, from http://ijpt.iums.ac.ir/article-1-55-en.html&sw=Intravenous+Tramadol-Induced+Sei

A case report of severe ovarian hyperstimulation syndrome
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Introduction: Ovarian hyperstimulation syndrome (OHSS) occurs when the ovaries are hyper stimulated and enlarged most commonly due to fertility treatments or sometimes rarely due to mutations in the follicle stimulating hormone (FSH) receptor. It is characterized by ovarian enlargement with multiple ovarian cysts and an acute fluid shift from intravascular space to extravascular space. Vasoactive substances released by the ovary thought to be responsible for increased vascular permeability associated with OHSS though exact pathology is not understood.

Description: 26-year-old lady who was primary sub fertile for 3 years and underwent inutero insemination (IUI) one week prior to the onset of symptoms. She was admitted with severe abdominal pain and increasing difficulty in breathing for 05 days. On admission found to have gross ascites and bilateral moderate pleural effusions with hematocrit of 45.9. Clinical suspicion of OHSS was made. Hematological investigations revealed neutrophil leucocytosis, mild elevated liver enzymes, hypoalbuminemia of 32 g/L, normal clotting profile, and normal serum osmolality. She was managed with oral cabergoline 0.5 mg daily, daily dose of steroids, fluid management to maintain urine output of 0.5–1 mL/kg/hr, prophylactic anticoagulants, and abdominal paracentesis for symptomatic relief coupled with intensive care monitoring. Her oxygen saturation was maintained with oxygen via face mask. Renal functions remained normal throughout.

Outcomes: Later in the course she was found to have intra uterine pregnancy (IUP) and OHSS regressed with clinical improvement and normalization of laboratory parameters.

Conclusion: This case demonstrated that early diagnosis and intensive supportive care are important in managing patients with OHSS.

Concurrent anaphylaxis-induced stroke and kounis syndrome: Rare complications following multiple bee stings
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Introduction: Bee sting is one of the most encountered insect bites in the world. Although it can cause various inflammatory manifestations, there are few reports of cardiac and neurovascular complications. Acute Stroke and Acute Coronary Syndrome (ACS) are life-threatening events that can be complicated by many different causes — rarely, anaphylaxis.

Description: This is a case report of a 58-year-old female who had a history of multiple bee stings while working in a cacao farm in Davao City, Philippines and presented immediately with decreased sensorium and right-sided weakness in the emergency department.

Outcomes: This is the second reported case of Concurrent Anaphylaxis-Induced Stroke with Kounis Syndrome following multiple bee stings.

Conclusions: Anaphylaxis-induced ischemic stroke is a unique entity. Therefore, patients who come to the emergency department due to hypersensitivity reactions must not always be undermined and must be assessed not only for Acute Coronary Syndrome (ACS) but also for Acute Stroke Syndrome.

References:
Tintinalli J, Stapczynski JS, Ma OJ, Yealy, DM. 9th Edition Emergency Medicine: A Comprehensive Study Guide. Page 1119
Pediatric pain assessment and management in the ED—Are we making a difference?

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Background: Pediatric patients present to the Emergency Department (ED) with pain from various causes. Appropriate assessment and management of pain is an important part of treatment in the ED.

Objective: The purpose of this study was to identify pain assessment at triage and the time to administering the first dose of analgesia.

Method: This was a multi-site retrospective study of pediatric patients (<18 years) who presented to the ED with pain or injury from February 2018 to May 2018. Initial pain assessment at triage, reason for visit, and time for analgesia were determined. For patients that received analgesia, the type and route were also identified.

Results: There were 4,128 patients with an average age of 9.6 years, and 49.1% were female. Only 74.2% had their pain assessed at triage, and 757 patients (18.3%) received analgesia. The median time to analgesia was 95 min (IQR: 49–154 min). Most patients presented with head/neck (36.1%), upper limb (21.6%) and lower limb pain (19.9%). The oral route was the most common delivery method for analgesia (67.4%), of which ibuprofen and acetaminophen were the main agents.

Conclusion: While pain assessment at triage has improved for pediatric patients, there is still a major shortfall in the adequate treatment of these patients with pain.

Paramedic management of back pain: A scoping review

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Background: One-third of patients with back pain arrive to the emergency department via ambulance transport. Yet little is known about how paramedics manage these patients.

Objectives: To map and summarize the available evidence that describes paramedic management of back pain.

Method: This scoping review follows guidance for scoping reviews and is reported according to PRISMA. Published peer-reviewed articles providing data on paramedic management of back pain were considered eligible. MEDLINE, EMBASE, CINAHL, SciELO, and Web of Science were searched from inception to June 2021. Screening and quality assessment were done by two independent reviewers.

Results: The search returned 2,385 records. After 619 duplicates were removed, 1,766 records were screened for eligibility. We included 24 studies in the review. Back pain is in the top 10 reasons for calls to an ambulance service. In Spain, home emergency nurses were more likely to administer diazepam (63%) and diclofenac (54%) to patients with low back pain when managed at their home and thoracolumbar fracture patients presenting to an emergency department trauma center were more likely to receive prehospital opioids (66%). Only three randomized trials have evaluated effectiveness of paramedic treatment for back pain; two
non-pharmacological strategies and one pharmacological intervention.

Conclusion: Ambulance services are frequently responding to people with back pain. There is a significant dearth of evidence to guide management of back pain in this setting. Future research is essential to understand paramedic care of back pain and how it influences the subsequent care that is delivered in the emergency department.

Air transfer of newborn with respiratory failure under non-invasive ventilation by emergency retrieval unit, Sabah

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Application of non-invasive ventilation (NIV) in critically ill patients during air transfer is not the preferred option of airway and ventilation management in aircraft, as it is associated with high failure. And like most intubation in pre-hospital environment, the risk of adverse outcome is higher compared. We describe a case of aeromedical transfer of a neonate who had failed elective intubation for hypercarbic respiratory failure. The neonate had congenital malformation of truncus arteriosus and ventricular septal defect, complicated with major extrinsic compression of the trachea. CT thorax measured the smallest intraluminal tracheal diameter of less than 1mm. Therefore, endotracheal intubation was not feasible as airway management in this case. However, the case required urgent cardiothoracic operation, a service that was not available in district Hospital Keningau. Road transfer with ambulance was logistically challenging of 2 h journey. Hence, air transfer was chosen with the advantage of shorter flight transfer of 25 min. The transfer was successful to Sabah Women and Children’s Hospital without the need to convert to invasive ventilation. However, the neonate subsequently succumbed due to worsening hypercarbic respiratory failure in neonatal intensive care unit. In conclusion, NIV cases are not the preferred airway and ventilatory management in aeromedicine. This measure should only be reserved for failed tracheal intubation cases.

Keywords: Air Transfer, Non-invasive Ventilation, Respiratory Failure, Neonate

Improving blood culture quality in the emergency department

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Introduction: Blood cultures (BC) remain a critical investigation in Emergency Department (ED) patients at risk of bacteraemia. However quality of BC collection is a key determinant of yield and utility of results.

Objective: To assess the effect of a multi-modal, nursing-led intervention to improve the quality of blood cultures taken in the ED, in terms of single culture, underfilling, and contamination rate.

Method: This before-and-after intervention study was conducted in the ED of a large urban tertiary referral hospital. A multi-modal intervention to improve BC quality was designed and delivered by two senior ED nurses over seven weeks. This comprised small group education, posters, educational videos, social medial presence, quality feedback, small group/individual mentoring, and production and supply of BC kits. Study data comprised rates of single, underfilled, and contaminated cultures in each of three eighteen-week periods: baseline (pre-intervention), post-intervention, and sustainability.

| TABLE 1: Process data, true positive and contamination rates by study period |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Patients                        | Baseline        | Intervention    | Post-Intervention | Sustainability |
| n = 765                         | n = 278         | n = 734         | n = 570          |
| Single sets                     | 430 (56.2%)     | 79 (28.4%)      | 167 (22.8%)      | 107 (18.8%)    |
| True positive, n (%)            | 86 (11.2%)      | 27 (9.7%)       | 76 (10.4%)       | 73 (12.8%)     |
| Culture Sets                    | n = 1,135       | n = 494         | n = 1,379        | n = 1,090      |
| Aerobic Volume ≤7mL             | 182 (52.8%)     | 51 (21.8%)      | 179 (19.2%)      | 137 (18.8%)    |
| Anaerobic Volume ≤7mL           | 162 (46.8%)     | 56 (24.5%)      | 210 (23.3%)      | 169 (23.8%)    |
| True positive, n (%)            | 136 (12.0%)     | 46 (9.3%)       | 130 (9.4%)       | 122 (11.2%)    |
| Contaminated, n (%)             | 42 (3.7%)       | 13 (2.6%)       | 21 (1.5%)        | 23 (2.1%)      |

Volume data were available for 2239 aerobic bottles and 2191 anaerobic bottles. Comparisons are baseline versus post-intervention.

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Results: Post-intervention, quality of BC taken significantly improved in terms of single culture set (22.8% vs 56.2%), bottle underfilling (aerobic 19.2% vs 52.8%, anaerobic 23.3% vs 46.8%) and contamination rates (1.5% vs 3.7%, p < 0.001 for all comparisons). These improvements were sustained up to nine months post intervention. Despite this, neither the proportion of BC sets returning a true positive result nor patients diagnosed with bacteraemia significantly increased post intervention. However, when all episodes of care were analyzed, total volume of blood cultured was significantly associated with diagnosis of bacteraemia (RR = 1.14, 95% CI, 1.02–1.26 per 10 mL).

Conclusion: Significant BC quality improvement was achieved and sustained through a nursing-led intervention requiring no external resources. (see Tables 1 and 2 below)

**Bench-marking blood culture quality in an Australian emergency department**

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Introduction: Blood culture (BC) quality is a key determinant of utility and yield. Few data exist to benchmark BC quality in Australian Emergency Departments (ED).

Objectives: To determine rates single culture, contamination and true positive BC in an Australian ED.

Method: This retrospective observational study was conducted in the ED of a large tertiary adult hospital in Brisbane. Single culture, contamination, and true positive BC quality improvement was achieved and sustained through a nursing-led intervention requiring no external resources.

**TABLE 2: Association between process outcomes and true positive blood cultures**

| Process Outcome                  | Number of patients | Positive culture n (% of patients) | Risk Ratio (95% CI) |
|----------------------------------|--------------------|-----------------------------------|---------------------|
| Single Set                       | 783                | 59 (7.5%)                         | 0.71 (0.53 to 0.94) |
| >1 set                           | 1564               | 167 (10.7%)                       |                     |

**TABLE 2 (continued):**

| Process Outcome                  | Positive Cultures n (% of total cultures) | Risk Ratio (95% CI) |
|----------------------------------|------------------------------------------|---------------------|
| Aerobic bottle underfilled       | 54 (9.8%)                                | 0.92 (0.66 to 1.27) |
| Aerobic adequately filled        | 181 (10.7%)                              |                     |
| Anaerobic bottle underfilled     | 55 (9.2%)                                | 0.84 (0.62 to 1.16) |
| Anaerobic adequately filled      | 174(10.9%)                               |                     |
rates were determined from hospital microbiology databases for all BC taken in the ED over calendar year 2017. Patient factors associated with single culture, contaminated BC and bacteremia were identified.

**Results:** Over 12 months 3700 BC sets were collected across 2450 episodes of care, corresponding to an average 6.7 patients cultured daily. A single BC set was collected from 1347 of 2450 patients (55%) and contaminants were isolated from 97 of 3700 BC sets (2.6%). Bacteraemia was diagnosed in 10.9% of patients. Single cultures were more often taken in patients discharged, admitted to the ED short stay unit or with suspected skin or ENT source. Contamination was associated with triage category one and suspected respiratory or CNS source. Bacteraemia was more often diagnosed in patients with suspected urinary source and hematology/oncology patients. Blood culture contamination was not associated with increased hospital stay.

**Conclusion:** Blood cultures taken from the majority of ED patients in this study were suboptimal. Opportunity exists for quality improvement in this important investigation.

(See figure below)

**Diagnosing identity threat in emergency physician servant leaders**

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**Background:** Emergency Physicians face multiple challenges in their quest to develop and maintain their identity as a leader at work, especially in the fluid, dynamic context of their high-stakes, multi-team system environment (1). Servant leadership, a follower-centric leadership approach, has been advocated as a panacea for healthcare transformation (2). However, positive benefits to leaders may be offset by negative effects of experiencing these identity challenges at work, potentially impacting on leaders, their teams, and their organization. Do these identity threats (3) harm the leader identity and subsequent leadership effectiveness of Emergency Physicians?

**Objectives:** To explore if Emergency Medicine leaders’ attitudes and behaviors change from servant-oriented to become more self-oriented as a result of identity threat, and if this process is influenced by the level of identification as a leader and the demands of work.

**Method:** The authors explore this phenomenon in a quantitative field study. Emergency Physicians and Advanced Trainees (n = 77) across Australia and New Zealand were purposively recruited from within the ACEM network from November 2021 to February 2022. A novel multi-wave data sampling technique called Experience Sampling Methodology captured participants’ immediate, real-life experiences at work. Participants completed before-and-after shift surveys on their smartphones, for 8 consecutive shifts. Data analysis is currently being undertaken using multilevel modeling techniques.

**Conclusion:** By discerning individual and organizational factors that may help or hinder leader identity, findings from the study will not only help Emergency Physicians practise effective leadership, but also inform the development of psychologically-safe work systems and identity-safe workspaces.

**References:**

1. Wong LY, Wilson S, Rixon A, Sendjaya S. Reframing leadership: Leader identity challenges of the emergency physician. Emergency Medicine Australasia. 2022;34 (1):127–9.
2. Cotey L, McKimm J. Putting service back into health care through servant leadership. Br J Hosp Med (Lond). 2019;80(4):220–4.
3. Petriglieri JL. Under Threat: Responses to and the Consequences of Threats to Individuals’ Identities. Academy of Management Review. 2011;36(4):641–62.

**Using a mindfulness smartphone app to mitigate stress of emergency department staff–A randomized controlled trial**

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**Background:** Working in the emergency department (ED) is often stressful. Research demonstrates that digital mindfulness can effectively reduce stress and promote better mental health. However, it is unknown if smartphone app-delivered mindfulness training is useful for ED staff.

**Objectives:** To test if regular mindfulness practice by using a smartphone app could reduce stress levels and promote staff wellbeing.

**Method:** A two arms, randomized controlled trial was conducted in two Australian EDs. Participants were randomized to either App or Control groups. App group participants were instructed to practice 10 min of daily meditation by using a readily accessible meditation app. Pre and post intervention on-line surveys were conducted to assess staff stress and wellness levels by using the Perceived Stress Scale, Maslach Burnout Inventory (emotional exhaustion/EE, depersonalisation/DP and personal accomplishment/PA) and Warwick-Edinburgh Mental Wellbeing Scale, respectively. Data were analyzed based on intention to treat (ITT).
Results: A total of 98 out of 148 enrolled participants completed all the surveys. Overall, participants reported statistically significant improvement on stress (F = 15.70, p < 0.001), burnout (EE (F = 14.22, p < 0.001), DP (F = 3.62, p = 0.030), PA (F = 7.51, p < 0.001)) and wellbeing levels (F = 10.71, p < 0.001) based on ITT analysis findings.

Conclusion: Mindfulness practice delivered via a smartphone app can mitigate ED staff stress and enhance staff wellness. Digital mindfulness can be added to the wellness toolkit to assist individual staff to increase wellness.

What inhibits emergency department clinicians from mindfulness practice?
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Background: Emergency department (ED) clinicians report one of the highest burnout rates among all healthcare workers. Results from a randomized controlled trial (RCT) demonstrate that smartphone-guided mindfulness practice can effectively lower stress and boost the wellbeing of ED clinicians. However, the practicing of mindfulness at work is reported as a challenge by ED shift workers.

Objectives: To explore the experience of ED clinicians practicing mindfulness using a smartphone app including what factors inhibited their mindfulness practice.

Method: This qualitative study was conducted in early 2020 in two Australian EDs. Twenty-four ED clinicians who had completed four weeks of smartphone app-guided mindfulness in the RCT attended 1:1 interviews. All interviews were audio-recorded. The qualitative description was used for content analysis.

Results: Participants reported that practicing mindfulness by using a smartphone app has been useful in lessening stress and boosting general wellbeing. Four main reported factors inhibiting their practice were (1) time, (2) motivation, (3) functionality of app, (4) lacking workplace privacy. Participants also disclosed that practicing mindfulness at the workplace was especially challenging due to them being time poor during the shifts and no space being available in their workplace for mindfulness practice.

Conclusion: To successfully implement widespread mindfulness practice at work, organizations need to facilitate its use by addressing the barriers of time and place. Providing protected time and dedicated space for mindfulness practice is the key to enhancing ED staff uptake and adhesion to mindfulness practice.

“Morning sickness, should I worry or not?”: Acute kidney injury in severe hyperemesis gravidarum: A case report
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Acute kidney injury (AKI) is defined as the decline in renal function over hours or days and includes both structural damage and loss of function. The resulting decline in renal function brings about the collection of harmful wastes and the disturbance of internal homeostasis. Acute kidney injury in pregnant women can result from various causes and is associated with significant fetomaternal morbidity and mortality. It was reported in many studies that acute kidney injury is less common in early pregnancy than in late pregnancy and the cause is not well-defined. A 25-year-old female was brought to our emergency department with a chief complaint of epigastric pain. Pertinent signs and symptoms were vomiting of 3 to 5 times per day, no urine output for 1 day and hypotension. Serum B-HCG test revealed a positive result, transvaginal ultrasound revealed an intrauterine pregnancy and an increased creatinine level of 761.50 umol/L or 8.61 mg/dL which required hemodynamic resuscitation or stabilization for the patient. In this case report, the reported case of acute kidney injury was due to severe hyperemesis gravidarum.

Use of multiple vasoactive agents through a peripheral line to treat shock in pediatric patients: Experience from a tertiary pediatric emergency department
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Introduction: Prompt vasoactive agent (VAA) use during initial resuscitation is essential in improving outcomes of shock. Central vascular access is often not readily accessible in non-ICU settings and there is a paucity of pediatric data on the use of peripheral VAAs in the emergency department (ED).

Objectives: We aim to report the use and complication rates of VAA infusions via peripheral intravenous lines (PIVs) for patients presenting to the ED of a tertiary pediatric hospital in Singapore over an eight-year period. Description: A retrospective observational study was conducted on all pediatric patients who received VAAs via PIVs at our ED from Jun 2009 till May 2016. Electronic and hardcopy records were reviewed.
Outcomes: 65 patients received peripheral VAAs. The median age was 8 years-old (IQR 2–13.5) and 53.8% were male. The most common indication was septic shock (69.2%) and dopamine (72.7%) was most commonly administered. We report up to two concurrent VAAs (24.4%) being administered peripherally, most commonly for septic shock (50.0%). The median time to fully transit to central VAA administration was 2 h (IQR 1–4). Overall survival to discharge was 70.8%. We did not report any direct complications in this case series.

Conclusions: The use of peripheral VAAs for cardiogenic and fluid-refractory shock in pediatric patients in the ED appeared to be a safe bridging measure prior to central access. We report the use of up to two concurrent peripheral VAAs. Larger prospective studies are needed to assess the comparative effectiveness and outcomes of central and peripheral VAA administration in the ED setting.

References:
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Evaluation of an evidence-based flow training curriculum for emergency department staff to decrease wait times
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Background: Training in emergency department (ED) efficiency is a significant gap in education for healthcare providers [1]. As part of a quality improvement initiative to decrease wait times at four EDs, our team designed and assessed an evidence-based flow training curriculum.

Objectives: To evaluate the effect of the training program on knowledge of ED efficiency and motivation to improve ED flow.

Method: Participants complete a self-rated online survey before and after the virtual training session. The survey includes five Likert-scale items regarding knowledge of ED efficiency and motivation to create change and open-ended questions to assess competency in patient-centered care and surge management. We converted the Likert-scale responses to numerical values and calculated means and standard deviations. Open-ended questions were analyzed thematically.

Results: Surveys were completed by nine nurses, one physician, and one nurse practitioner at the first ED site. For questions one, three, and four, the average level of agreement with each statement was higher after completing the training (see Table 1). In open-ended questions, participants were more likely to describe wait times as negatively impacting patient-centered care and identify specific strategies to manage patient flow after completing the training.

Conclusion: Our findings suggest that the training course improves knowledge of patient flow strategies in the ED. Data from remaining hospital sites is required to support this finding.

Reference:
1. Carmelli C, Watson E, Villarroel NA, Dixon W, Clarke SO: A national survey of workflow efficiency education among emergency medicine residency training programs. Ann Emerg Med 2020; 76: S140–141.

Role of hypotensive resuscitation in the management of trauma patients
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Background: Hemorrhagic shock in trauma patients is the second leading cause of early death, there is still a

TABLE 1: Means and standard deviations of Likert-scale responses pre and post-training

|                      | Pre-training | Post-training |
|----------------------|--------------|---------------|
|                      | Mean | SD  | Mean | SD  |
| Knowledge of ED efficiency | 4.50 | 0.50 | 4.82 | 0.40 |
| Understand that their decisions impact patient flow | 4.88 | 0.29 | 4.82 | 0.40 |
| Knowledge of strategies to improve ED flow | 4.00 | 0.94 | 4.73 | 0.47 |
| Understand the impact of team work on ED efficiency | 4.25 | 0.89 | 4.55 | 0.69 |
| Motivated to improve patient flow | 4.75 | 0.58 | 4.70 | 0.48 |
debate regarding the value of permissive hypotensive resuscitation (PHR) compared to high volume resuscitation in the standard of care of the fluid replacement.

**Methods:** the literature search was conducted using PubMed, OVID, Google scholar, grey literature, BestBETs, and Clinical Trial Registry resulted in 66 papers, seven articles were selected (Table 1), the primary outcome is in-hospital mortality, secondary outcomes include length of stay, utilization of blood product volume or types, and complications related to fluid restriction or administration, including hypersensitivity, coagulopathy, renal failure, and infection.

**Results:** Included studies showed a survival benefit which may be due to reducing crystalloid, most of the studies failed to maintain the target blood pressure, mortality rate with conservative resuscitation was lower in most studies. Limitations include, the quality of the included randomized trials was generally poor to moderate, there was lack of blinding, also trials were underpowered due to either: study design or early termination, no assessment of the likelihood of publication bias, no individual patient data in the systematic review, the sample size was limited in most studies, trials are poor to moderate quality studies, there is a need for further high-quality, adequately powered trials.

PHR may reduce mortality, but it is hard to know if it is applied today in the era of blood products resuscitation, as the biggest trial "Bickel's" used more crystalloids which may be harmful today, further trials on PHR are required.

**Flood syndrome: Spontaneous paracentesis of ruptured umbilical hernia**

Kenjie Zamora

**Introduction:** Flood syndrome, spontaneous paracentesis, or spontaneous rupture of umbilical hernia is a rare and often a potentially fatal complication in patients with ascites and chronic liver disease. Mortality rates are high as 30% with chances of developing various intra-abdominal complications and may lead to patient's demise.

**Case Presentation:** We present a case of Flood syndrome in a 50-year-old male with known case of chronic hepatitis B infection. The patient came in at the ED due to spontaneous rupture of umbilical hernia an hour post-injury brought about by sudden change in position causing an increase intrabdominal pressure. Clinically the patient was in distress and immediate resuscitation procedures were done, immediate packing of leaking ascitic fluid was done. Patient was referred and managed by different specialty areas such as surgery and internal medicine along with gastroenterology specialist as a co-managing service for stabilization and immediate resuscitation.

**Conclusion:** Dealing with cases wherein ED physicians does not frequently encounter often faces treatment dilemmas and one which is this case of flood syndrome. Despite not having any standard treatment guideline, ED

**TABLE 1: List of included studies**

| Author | Type | Journal | Country | Year |
|--------|------|---------|---------|------|
| William H. Bickel | RCT | New England Journal of medicine | USA | October 1994 |
| Richard P. Dutton | RCT | The Journal of TRAUMA Injury, Infection, and Critical Care | USA | Feb 2002 |
| C. Anne Morrison, MD, MPH, et al | RCT | The Journal of TRAUMA Injury, Infection, and Critical Care | USA | March 2011 |
| Marquinn D. Duke, et al | RCT | The journal of trauma and acute care surgery | USA | June 2012 |
| Martin A. Schreiber, MD et al | RCT | The journal of trauma and acute care surgery | NA (USA and Canada) | April 2015 |
| Matthew M. Carrick, MD et al | RCT | The Journal of TRAUMA Injury, Infection, and Critical Care | USA | March 2016 |
| Alexandre Tran, MD et al | SR & | Meta-Analysis | Journal of Trauma and Acute Care Surgery | NA (USA and Canada) | 2018 |
physicians must keep in mind that when dealing such cases in the emergency department, the primary focus still is the hemodynamic stabilization of the patient prior to any surgical management. Prompt referral with multispecialty services, adequate assessment, resuscitation and/or early operation are the key in the management 

**Keywords:** Flood syndrome, ruptured umbilical hernia, spontaneous paracentesis

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**Using network analyzes to characterize Australian and Canadian frequent attenders to the emergency department: A retrospective cohort study**

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**Background:** Frequent attenders to the emergency department (ED) are a heterogenous and complex group. Subgroups of this population require further characterization to inform highly tailored interventions.

**Objectives:** To characterize frequent attenders according to age groups, at an Australian and a Canadian tertiary hospital.

**Method:** We conducted a retrospective population-based study using administrative data over the 2018 and 2019 calendar years. Participants were from a tertiary hospital in Melbourne, Australia and one in Toronto, Canada. Frequent attenders were defined as patients with four or more ED visits in 12 months. Characteristics of younger (18 to 39 years), middle-aged (40 to 69 years) and older (70 years and over) frequent attenders were described using descriptive statistics and network analyzes.

**Results:** Younger frequent attenders were characterized by mental illness and substance use, while older frequent attenders had high rates of physical (including chronic) diseases. Middle-aged frequent attenders were characterized by a combination of mental and physical illnesses. These findings were observed at both hospitals. Across all age groups, the network analyzes between the Melbourne and Toronto hospitals were different. Among older frequent attender visits, more diagnoses were associated with high triage acuity at the Toronto hospital than at the Melbourne hospital. Some associations were similar at both sites, including the negative correlation between high triage acuity and joint pain.

**Conclusion:** Younger, middle-aged, and older frequent attenders have distinct characteristics. Future interventions to reduce ED visits should consider the heterogeneity of frequent attenders who have needs specific to their age, presenting problems and jurisdiction.

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**The workload of Pediatric patients positive for omicron on the emergency department of a tertiary referral hospital**

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**Background:** The Australian Capital Territory (ACT) with a population of 431000 serviced by 2 Emergency Departments (EDs), experienced a COVID-19 outbreak of the Omicron strain with 26136 cases (7 deaths).

**Objectives:** With the literature raising concern of Omicron being more severe in children, this study aimed to describe the workload of Pediatric patients positive for Omicron on the Emergency Department of a tertiary referral hospital.

**Method:** Retrospective cohort study of ACT cases diagnosed during the Omicron outbreak (13-Dec – 23-Jan 2022) who visited The Canberra Hospital, a tertiary referral center. ED visits were defined as patients with one or more ED visits within 1 day before a positive test and clinically cleared date regardless of state of residence, admissions as those admitted while infectious. Wilson score intervals were used to approximate 95% confidence intervals.

**Results:** 1589 Pediatric patients made 1776 presentations to ED during the study period. Of these, 70 patients (4.41%, 95% CI 3.30–5.53) were positive for COVID-19, making 73 presentations (4.11%, 95% CI 3.28–5.14) and resulting in 28 admissions. 21.7% (95% CI 17.6–26.4) of all ED presentations positive with COVID-19 were Pediatric. 16% of all Pediatric ED presentations (n = 46) with diagnoses commonly associated with COVID-19, were positive. 15 admissions had the primary diagnosis of “COVID-19” with a median LOS of 1 night and 4 were surgical admissions with median LOS of 0.5 nights.

**Conclusion:** Pediatric patients represented a substantial proportion of ED presentations while infectious with the Omicron strain of COVID-19.

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**Changing ED and inpatient demand during delta and omicron COVID-19 outbreaks**

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**Background:** The Australian Capital Territory (ACT) with a population of 431000 serviced by 2 Emergency Departments (EDs), experienced a COVID-19 Delta strain outbreak Aug-Dec 2021 with 2062 cases
(12 deaths) and an Omicron strain outbreak from Dec 2021 with 26136 cases (7 deaths) by 23-Jan-2022.

Objectives: This study aimed to describe the difference in rates of ED visits and hospital admissions between the Delta and Omicron outbreaks.

Method: Retrospective cohort study of ACT cases diagnosed across two periods; 09-Aug – 12-Dec and 13-Dec - 23-Jan where Delta and Omicron were the predominant strain respectively. ED visits were defined as patients with one or more visits to The Canberra Hospital ED, a tertiary referral center, between 1 day before a positive test and clinically cleared date. Admissions were defined as those admitted while infectious. Two sample t-tests were used to compare rates, Wilson score intervals approximated 95% confidence intervals.

Results: During Delta, 124 patients made 137 visits to ED while during Omicron 319 patients made 337 visits. The presentation rate was 6.60% (95% CI 5.60–7.75) during Delta and 1.29% (95% CI 1.16–1.43) for Omicron. 133 were admitted during Delta and 158 during Omicron. The admission rate was 6.45% (95% CI 5.47–7.59) during Delta and 0.60% (95% CI 0.52–0.71) for Omicron. There was a significant decrease in presentation and admission rate in Omicron (p<0.05).

Conclusion: The rate of ED presentations and admissions decreased significantly in the Omicron outbreak compared to Delta.

Atrial myxoma as a rare cause of stroke

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Introduction: Myxomas are rare, accounting for 50% of benign primary cardiac tumors. We present a case presenting with a transient episode of neurologic dysfunction that was diagnosed with atrial myxoma by Point-of-Care Ultrasound (PoCUS).

Case Description: A 62 years old man with previous history of stroke in 2015 was found to be less responsive in Radiology Department while booking an ultrasound appointment. Patient’s initial Glasgow Coma Scale (GCS) was 11/15 (E4V1M6). He gradually regained orientation and responsiveness in ED. Patient was tachypneic with a respiratory rate of 32, oxygen saturation of 96%, blood pressure 164/99 mmHg and heart rate 112 beats/min. Patient had a systolic murmur with bibasal rales. Neurological examination revealed cerebellar signs. His electrocardiogram showed ST depression in lateral leads. PoCUS showed an oscillating left atrial mass protruding to left ventricle measuring 6.3 x 3.1cm in the left atrium attached to interatrial septum. Oxygen supplementation was given. CT Brain was performed with comparison to previous CT Brain in 2015 showed multifocal chronic infarcts with underlying small vessel disease, cerebral atrophy and no intracranial bleed. Patient was treated as atrial myxoma complicated with transient ischemic attack (TIA) and started on warfarin. Unfortunately, he declined any surgical intervention.

Conclusion: Atrial myxoma is a rare cause of stroke and this is due to embolized tumor fragments. Our patient had recurrent neurological deficit in a span of 5 years and this may be the likely culprit. Early diagnosis of atrial myxoma is important as surgical intervention yields high cure rate and prevent complications. PoCUS to look for this lesion should be performed in emergency department setting for stroke patients as it is fast, easy and could guide early intervention.

Priapism: An exceptional presentation in male patients with chronic myeloid leukemia

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Introduction: Priapism is a persistent penile erection that persists without sexual stimulation. We report a case of a young adult who presented to the emergency department (ED) with priapism in a patient with chronic myeloid leukemia (CML).

Case Description: A 22 year old male presented to ED with history of an erect penis for more than 4 h duration. Patient complained of mild discomfort over the penis but was still able to pass urine. There was no history of trauma, fever, hematuria or use of any medication. On examination, patient was well orientated with stable vital signs. Physical examination revealed hepatosplenomegaly. His penis was erect and firm. Laboratory findings revealed white blood cell count of 366.0 X10⁹/μL, platelet count of 843 X10⁹/μL, uric acid 534 μmol/L, lactate 1104 U/L. Based on clinical and lab findings, the working diagnosis of the patient was priapism with underlying hematological malignancy. Patient underwent therapeutic aspiration, irrigation and intracavernous adrenaline injection by the urology department. He was started on hydroxyurea therapy, allopurinol and given adequate hydration for potential tumor lysis syndrome. Peripheral blood film showed features suggestive of CML. Detection of BCR-ABL 1 fusion transcript (Major, b2a2) by qualitative PCR confirmed the diagnosis of chronic phase CML. Bone marrow aspirate and trephine biopsy (BMAT) revealed hypercellular marrow with granulocytic hyperplasia. Patient is currently on imatinib 600mg /day and has no recurrences. Only <3% of CML patients present with priapism as their initial presentation. The pathophysiology is related to venous obstruction from microemboli/thrombi and hyperviscosity due to increased number of circulating leukocytes.

Conclusion: This case is unique as priapism is a rare presentation in leukemia. Priapism is a urological emergency that needs to be address promptly to prevent erectile dysfunction. A combined surgical and oncological approach for priapism has yield a good outcome for the patient.