SHORT REPORT

Informing emergency care for all patients: The Registry for Emergency Care (REC) Project protocol

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Abstract

Objective: In Australia, the current ED burden related to COVID-19 is from ‘suspected’ rather than ‘confirmed’ cases. The initial aim of the Registry for Emergency Care (REC) Project is to determine the impact of isolation processes on the emergency care of all patients.

Methods: The REC Project builds on the COVID-19 Emergency Department Quality Improvement (COVED) Project. Outcomes measured include times to critical assessment and management.

Results: Clinical tools will be generated to inform emergency care, both during and beyond the COVID-19 pandemic.

Conclusions: The REC Project will support ED clinicians in the emergency care of all patients.

Key words: COVID-19, emergency, isolation, quality improvement, registry.

Background

The number of patients with suspected COVID-19 presenting to EDs will fluctuate throughout 2020. Although the current burden of confirmed cases in Australia remains low, the pandemic has prompted important changes to clinical processes in the ED. There has been a widespread increase in the implementation of infection prevention and control (IPC) procedures and the establishment of isolation zones.

The ongoing impact of the pandemic is likely to be substantial, affecting the resource allocation, care pathways and outcomes of all patients, regardless of their COVID-19 status. Further, the role of EDs in the syndromic surveillance for patients with communicable diseases will continue indefinitely.

Addressing these major and ongoing challenges will require robust systems for monitoring the presenting symptoms, assessment findings, management and outcomes for all patients presenting to the ED. Although efforts to inform the clinical and system-level care of patients with suspected and confirmed COVID-19 have been initiated, there is now a greater need for ED clinicians to understand the indirect effects of infection containment strategies, including the impact of IPC and isolation processes, to emergency care provision. The implementation of systems that monitor presentations and outcomes on an ongoing basis will increase resilience, improving the capacity of EDs to care for all patients with acute illness and/or injury, not just those patients with communicable diseases.

Aim

The aim of this manuscript is to introduce the Registry for Emergency Care (REC) study protocol. The first objective of the REC Project is to determine the impact of patient isolation and IPC processes on ED length of stay for adult patients. The complete list of medium-term and specific objectives of the REC Project is provided in Box 1.

Methods

The REC Project is a prospective cohort study, with a series of nested cohort studies (each with a pre-determined primary exposure...
and primary outcome). The current project site is the Alfred Hospital, Melbourne, with the opportunity for other Australian EDs to participate to form a REC network. The Alfred Hospital is a tertiary, adult, level 1 trauma centre with an ED census of approximately 70 000.

All patients presenting to the ED, aged 18 years or more, will be included. Outcomes measured will include ED length of stay, time to emergency procedures, ED disposition destination, ICU admission, the number of ventilator free days, hospital length of stay and hospital admission.

Variables to be collected will cover the spectrum of emergency care: demographics, presenting complaint plus comorbidities, processes of care (including time to emergency procedures), measures of severity (including first vital signs and triage category) and outcomes (including those listed above). The planned initial REC data set is described in Box 2. These variables build on the existing COVED Project and COVED Registry and are mostly consistent with the variables in the World Health Organization International Registry for Trauma and Emergency Care. The International Registry for Trauma and Emergency Care has been developed as an important resource to help deliver the recommendations of last year’s World Health Assembly Resolution 72.16 globally, including across the Indo-Pacific region. The REC list of variables is flexible to change as new data emerges regarding outcome predictors and treatment strategies.

Up-to-date versions of the case report form and data dictionary will be made available on The Alfred’s academic programmes website at www.emergencyeducation.org.au. This will facilitate standardisation of variables across other sites interested in participating.

Administrative data will be automatically exported from the Alfred Hospital’s Electronic Medical Record; the data for the additional clinical variables will be captured from the tailored clinician form embedded in the Electronic Medical Record. All data will be entered into the novel REC utilising Research Electronic Data CApPure (REDCap) software (licensed to Monash University). Analyses will be conducted to meet the objectives listed in Box 1.

The focus of the REC Project is consistent with guidance from the Australasian College for Emergency Medicine regarding research priorities during the COVID-19 pandemic. Ethics approval for the REC Project was obtained from the Alfred Human Research Ethics Committee (Project No: 282/20) on 12 May 2020 and was registered with the Monash University Human Research Ethics Committee on 15 May 2020 (Project No: 24723).

Impact

The REC Project will inform real-time improvements in ED care; it will determine the clinical predictors of patient-centred outcomes for all patients seeking emergency care, and guide systems design, resource allocation and clinical management in order to meet current and future challenges. In the short-term, it will help mitigate the indirect effects of COVID-19 and the impact of virus containment strategies.

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| Variable                                      | Type         | Domain            |
|----------------------------------------------|--------------|-------------------|
| **Demographics and history**                 |              |                   |
| Age (years)                                  | Continuous   | 18 to 120         |
| Sex                                          | Binary       | Male or Female    |
| Overseas travel†                             | Binary       | Yes or No         |
| Close contact with confirmed COVID-19 case†  | Binary       | Yes or No         |
| Residential care facility resident           | Binary       | Yes or No         |
| Healthcare worker†                           | Binary       | Yes or No         |
| Pregnancy†                                   | Binary       | Yes or No         |
| **Comorbidities**                            |              |                   |
| Chronic respiratory disease                  | Binary       | Yes or No         |
| Chronic cardiac disease                      | Binary       | Yes or No         |
| Chronic hypertension                         | Binary       | Yes or No         |
| Diabetes mellitus                            | Binary       | Yes or No         |
| Smoker or ex-smoker                          | Binary       | Yes or No         |
| Obesity                                      | Binary       | Yes or No         |
| Current known cancer                         | Binary       | Yes or No         |
| Immunosuppression                            | Binary       | Yes or No         |
| Psychiatric illness‡                         | Binary       | Yes or No         |
| Other                                        | Free text    | Yes or No         |
| **ED arrival**                               |              |                   |
| Interhospital transfer                       | Binary       | Yes or No         |
| Mode of arrival                              | Nominal      | Types of transport|
| Triage category                              | Ordinal      | 1 to 5            |
| Team callout†                                | Binary       | Yes or No         |
| Trauma                                       | Binary       | Yes or No         |
| Shocked trauma                               | Binary       | Yes or No         |
| Cardiac arrest                               | Binary       | Yes or No         |
| STEMI                                        | Binary       | Yes or No         |
| Stroke                                       | Binary       | Yes or No         |
| Sepsis                                       | Binary       | Yes or No         |
| Behaviour of concern                         | Binary       | Yes or No         |
| First pain score‡                            | Ordinal      | 0 to 10           |
| Isolation precautions in ED‡                 |              |                   |
| Contact                                      | Binary       | Yes or No         |
| Droplet                                      | Binary       | Yes or No         |
| Airborne                                     | Binary       | Yes or No         |
| Duration of time in isolation in ED‡         | Continuous   | 0 to Maximum      |
| **Presenting complaint**                     |              |                   |
| Coryza†                                      | Binary       | Yes or No         |
| Fever                                        | Binary       | Yes or No         |
| Cough                                        | Binary       | Yes or No         |
| Sore throat†                                 | Binary       | Yes or No         |
| Acute dyspnoea                               | Binary       | Yes or No         |
| Acute diarrhoea                              | Binary       | Yes or No         |
| Acute muscle aches†                          | Binary       | Yes or No         |

*Continued*
## BOX 2. (continued)

| Variable                                                   | Type      | Domain             |
|------------------------------------------------------------|-----------|--------------------|
| Acute fatigue†                                            | Binary    | Yes or No          |
| Anosmia and/or dysgeusia†                                  | Binary    | Yes or No          |
| Acute chest pain‡                                          | Binary    | Yes or No          |
| Acute limb weakness‡                                       | Binary    | Yes or No          |
| Acute injury‡                                              | Binary    | Yes or No          |
| Acute altered conscious state (non-injury)‡                | Binary    | Yes or No          |
| Acute syncope‡                                            | Binary    | Yes or No          |
| Acute abdominal pain‡                                      | Binary    | Yes or No          |
| Acute anaphylaxis‡                                         | Binary    | Yes or No          |
| Number of days since onset of first symptom                | Continuous| 0 to 28            |

### Signs

**Vital signs**
- Systolic blood pressure (mmHg) Continuous 0–300
- Heart rate (beats/min) Continuous 0–300
- Respiratory rate (breaths/min) Continuous 0–50
- Temperature (degrees Celsius) Continuous 20–50
- GCS Ordinal 3–15
- AVPU Ordinal A, V, P or U
- Pupil size‡ Continuous 0 to 20 mm
- Pupil reactivity‡ Binary Yes or No
- Abnormalities on chest auscultation Binary Yes or No

### Investigations

- Time to first chest X-ray (minutes)‡ Continuous 0 to Maximum
- Abnormalities on chest X-ray Nominal Abnormality and Type
- Time to first CT scan (minutes)‡ Continuous 0 to Maximum
- Abnormalities on chest CT† Nominal Abnormality and Type
- Blood test results (ED) Numerical Test specific
- SARS-CoV-2 test result in ED Binary Positive or negative
- SARS-CoV-2 test result – subsequent as inpatient Binary Positive or negative

### Management in the ED

- Clinical impression (Severity)† Ordinal Mild to Extreme
- Goals of care Ordinal A, B, C or D
- Oxygen delivery methods in the ED
  - Nasal prongs† Binary Yes or No
  - Mask† Binary Yes or No
  - High flow nasal† Binary Yes or No
  - Non-invasive ventilation Binary Yes or No
  - Invasive ventilation Binary Yes or No
- Time of ETT in ED (minutes)‡ Continuous 0 to Maximum
- Time NIV commenced in ED (minutes)‡ Continuous 0 to Maximum
- Thoracostomy in ED‡ Binary Yes or No
- Time of thoracostomy in ED (minutes)‡ Continuous 0 to Maximum
- Blood products in ED‡ Binary Yes or No

*Continued*
data for improving patient outcomes (APP1142691).

**Author contributions**
All authors listed have contributed to the concept and design of this Short Report, including its analysis plan, and have critically reviewed the Short Report for content.

**Competing interests**
GMOR, BM and PAC are section editors for *Emergency Medicine Australasia*.

**Data availability statement**
Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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