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Multispecialty Nursing During COVID-19: Lessons Learned in Southern California

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A multispecialty nursing team plays a crucial role in key decision making, education, prevention, screening, assessment, diagnosis, management, data collection and dissemination of best practices during the novel coronavirus disease (COVID-19) pandemic. Using examples from a large, tertiary medical center in Los Angeles, this paper highlights contributions made by multispecialty nursing specialties to optimize health and safety for patients and frontline health care workers. Recognizing nurses’ ongoing critical role encourages and informs further collaboration and serves as a catalyst to innovation for a healthier tomorrow. The result of the COVID-19 pandemic will be felt for years to come.

The outbreak of novel contagious coronavirus (SARS-CoV-2, herein called COVID-19) is complicated by severe acute respiratory syndrome that requires hospitalization, intensive care utilization, and for a percentage of patients, mechanical ventilation. The prevalence and severity of the infection is greater in comorbid persons with underlying diabetes, obesity, cardiovascular disease such as hypertension, or in African American and other minority communities. COVID-19 is considered a pandemic emergency, spanning across the globe with 4,782,539 confirmed cases as of May 18, 2020, and 91,921 deaths in the United States to date.

When treating COVID-19 patients, multispecialty nursing teams are responsible for managing critical care environments, and improving screening, diagnosis, treatment, and education about ever-changing patient care models during the COVID-19 pandemic. COVID-19 has changed, not only the way nurses care for patients, but also the way that we educate and enhance the professional development of our nursing staff. The necessity of conducting research must be balanced with the burden of managing patient load for the frontline nurses.

KEY POINTS

- Multispecialty nursing teams are responsible for managing critical care environments and improving screening, diagnosis, treatment, and education about ever-changing patient care models during the COVID-19 pandemic.
- COVID-19 has changed, not only the way nurses care for patients, but also the way that we educate and enhance the professional development of our nursing staff.
- The necessity of conducting research must be balanced with the burden of managing patient load for the frontline nurses.

IMPACT OF SENIOR NURSING LEADERSHIP DURING COVID

When senior leadership is faced with a crisis, they first and foremost need to assess their current workforce and resources to ensure they can rise to meet
anticipated/ unanticipated challenges and increasing demands. A keen chief nurse executive (CNE) is key in ensuring the nursing teams are well equipped, prepared, and nimble to handle dynamic house-wide changes. Table 1 highlights early real-world experiences from a CNE at a large tertiary medical center in Los Angeles. In partnership with senior nursing leadership, the CNE determined to shift some areas of the medical center closed as other areas began to surge. As registered nurses (RNs) became the eyes and ears of the entire health care team, nursing leadership and staff not only confronted the enormity of work brought on by this pandemic, but they did so with speed, dexterity, and an unwavering sense of collaboration. The nursing institute developed, taught, and implemented a team nursing model in which medical-surgical nursing staff were redeployed and retrained in new critical care-based roles led by a critical care RN.11 These surge planning and redeployment efforts led by senior leaders were imperative to ensure crucial staffing needs were achieved. A multispecialty nursing team composed of nurse practitioners (NPs), nurse educators, clinical nurse specialists (CNS), frontline RNs, and nurse scientists worked together synergistically to form teams, educate staff and patients, streamline performance improvement, and implement clinical trials across the medical center.

THE ROLE OF THE NURSE PRACTITIONER
NPs play a crucial role in the prevention, screening, diagnosis, and management of COVID-19 (Figure 1). Given the rapidly evolving nature of COVID-19, NPs have the professional responsibility to remain current on the most up-to-date evidence for efficacious treatment.

Table 1. Nurse Executive Perspective: Real-World Experiences From a Chief Nurse Executive at a Large Tertiary Medical Center

| Category                        | Description                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **PPE feasibility**             | Initial experience with 1 family of 3 (late January) handled with full special pathogen–level use of personal protective equipment. Later expansion of cases led to that level of protection not being feasible.                                                                                                                                     |
| **PPE recommendations**         | Confusion caused by a lack of agreement on proper health care worker personal protective equipment for SARS-CoV-2 resulted from shifting isolation guidelines between airborne and droplet isolation precautions by the WHO, U.S. CDC, local Los Angeles County Department of Public Health, and the State of California Occupational Health Administration. |
| **Dissemination of up-to-date information** | Organization of resources to deliver up-to-date information on the disease, proper use of personal protective equipment, and testing protocols.                                                                                                                                   |
| **Surge planning/ redeployment team-nursing model** | Planning for an anticipated surge beyond traditional capacity into nontraditional clinical areas. Staffing used a tiered approach to include nurses without competencies on the units, and they all have been supported by nurses with established competencies. |
| **Expanding role of advanced practice nurses** | Activating advanced practice registered nurses to expand capacity into nontraditional clinical areas                                                                                                                                                                                                                                         |
Both primary and acute care NPs serve as frontline providers and expert consultants implementing evidence-based care for the management of COVID-19.

**Prevention**

NPs provide trusted education and counseling to patients on nonpharmaceutical interventions including proper hand hygiene techniques, social distancing, environmental disinfection procedures, and barrier mask recommendations. Prevention of virus transmission remains the cornerstone of halting the cycle of infection and spread of disease. NPs are using innovative methods to deliver care focusing on prevention, which includes the use of telehealth visits with video capability, telephone follow-up visits, and electronic consultations, thus preventing virus exposure to patients and health care workers.

NPs also play a pivotal role in helping our chronically ill patients continue to receive care despite reductions in in-person clinic visits and patients avoiding the emergency department for non-COVID-19 illnesses. NP telemedicine visits have several advantages. A few specific examples include providing frequent video-telemedicine visits for improved blood pressure/cholesterol/chronic stable angina medication titration for elderly patients who are working to optimize medication therapy and avoid side effects and polypharmacy. Video-telemedicine visits also help the young. In the Postpartum Heart Health program, management of complications associated with postpartum hypertension and preeclampsia via video-telemedicine is convenient for new mothers who prefer not to pack up a newborn and travel to higher risk areas to discuss titrating down on medications or who may be experiencing symptoms such as headache, or visual changes that would result in an emergency department visit. Another advantage is the reduced institutional overhead costs while having the ability to bill for professional fees.

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**Figure 1.** Nurse Practitioner Clinical Model for Providing COVID-19 Management. ED, emergency department; PUI, patient under investigation; RT-PCR, reverse-transcription polymerase chain reaction.
Screening/Diagnosis
Nurse practitioners serve as the first contact in the COVID-19 surge screening and triage tents. They play a key role in determining whether the patient can be treated and discharged on the spot or directed to the most appropriate care setting in the hospital or at an alternative site. The clinical presentation for COVID-19 is quite variable, ranging from asymptomatic, to severe illness and death, making screening algorithms imprecise. The cardinal symptom of COVID-19 is fever, and in general, the majority of cases may experience cough, fatigue, anorexia, shortness of breath, and or myalgias.11 Less commonly reported symptoms include headache, rhinorrhea, sore throat, vomiting, and or diarrhea.12 Anosmia (loss of smell) or ageusia (loss of taste) have been anecdotally reported preceding the onset of respiratory symptoms and during mild illness.11 Screening protocols for COVID-19 should query for these cardinal signs of new onset fever and respiratory tract symptoms.

Laboratory testing for COVID-19 should be performed for suspected cases based on the updated World Health Organization case definition criteria. The Centers for Disease Control and Prevention (CDC) recommends collection of an upper respiratory sample by a health care professional, utilizing one of the following techniques: nasopharyngeal swab, oropharyngeal swab, or nasopharyngeal wash/aspirate.13 If a patient is suspected of having COVID-19, the NP should immediately implement isolation and recommended infection prevention practices.

Treatment
It is imperative that the NP appropriately triage and classify patients with mild/moderate disease and or severe illness. Patients with mild COVID-19 illness (without hypoxia) and those who do not require hospitalization may be able to manage their illness in the home setting with supportive care, home isolation, and close health care provider follow-up.14 As an integral part of the critical care team, acute care NPs are responsible for managing hypoxemia, performing intubation, and monitoring/treating COVID-19 sequelae including pulmonary, cardiac, and/or vascular complications. Acute care NPs practicing in the inpatient setting with a care team will need to follow management strategies as outlined in the Society of Critical Care Medicine’s (SCCM) Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Corona Virus Disease 2019.15

To date, there is no current evidence to recommend specific treatments for patients with suspected or confirmed COVID-19. On May 1, 2020, remdesivir received Food and Drug Administration (FDA) Emergency Use Authorization for the treatment of COVID-19 in select patients based on severity of disease for compassionate use.16 Preliminary, non-peer reviewed findings from the RECOVERY (Randomised Evaluation of COVID-19 therapy) trial show dexamethasone may reduce mortality in patients with COVID-19 who require oxygen or a ventilator.17 Additional treatment options include investigational drugs and off-label use of FDA-approved medications risks and benefits should be a team-based discussion with the patient at the center of the discussion.

COVID-19 Education for the Acute Care Setting
Guidelines produced by SCCM were incorporated into the education delivered to the critical care RNs (CCRN).15 The critical care nurse educators and CNS team facilitated immediate training for all critical care staff on indications and technique on prone positioning, as 1 example.15 The training was due to an assessment that multiple CCRNs needed preparation to treat patients with acute respiratory distress syndrome, a complication of critical COVID-19 patients. An assessment was conducted to evaluate where the COVID-19 patients should be admitted. A cohorting approach was determined as the most efficient and safe practice within the medical/respiratory intensive care unit (ICU) and the cardiac observation unit. The nursing units chosen were previously prepared to accept respiratory patients, with the appropriate monitoring needed. In preparation for surging cases of COVID-19, the CNS and educator team assisted multiple units in preparation for admitting COVID-19 patients, ensuring appropriate precaution signs, adequate training for donning and doffing PPE, and treatment for patients. Staff on all units were educated and instructed on the importance of safety and making sure PPE was worn correctly. Recommendations from the CNS and educator team were implemented into a practice change for a COVID-19 rapid response or code blue. The protection of the staff has always been a priority, and measures were put in place, including limiting the amount of staff in the room, using a bag-mask valve only in intubated patients to decrease viral transmission via aerosolized exposure to the team, and implementing the use of a mechanical chest compression device during resuscitation as an option to minimize exposure and potential transmission of COVID-19 during chest compressions.

COVID Education for Women’s and Children’s Services
Women’s and children’s services (WCS) incorporates models of care for a wide array of patients, including prenatal through postpartum women, neonatal care, and pediatric patients up to 21 years old. With the CDC recommending separation of neonates from COVID-19–positive mothers at birth, normal delivery, inpatient care, and discharge processes needed to be
modified. The pediatric intensive care unit (PICU) was selected as the cohort unit for all pediatric COVID patients, including these newborns that would have usually remained with their mother in postpartum or in nursery settings. The CNS and educator team collaborated with other WCS nursing leaders, physicians, social workers, lactation consultants, case managers, and child life specialists to support the educational needs of nursing staff across all these units, as well as the unique COVID-19 discharge needs of the separated mother/baby dyad. These processes included educating PICU staff on state-mandated newborn screenings, creating discharge material, incorporating best practices for breastfeeding while under COVID-19 home isolation guidelines, and supporting maternal/family bonding using technology such as video chats.

THE CENTRALIZED NURSE EDUCATOR

The centralized nurse educators in the department of nursing education provide institution-wide education for continuing, specialty, and needs-based education (Table 2). Nurse educators provided in-unit rounding 7 days per week for COVID-19-related education and developed an online “source of truth” for up-to-date COVID-19 information.

Redeployment efforts took center stage for optimizing staffing needs and avoiding furloughs of nursing staff. One hundred sixteen RNs were redeployed with 64 attending medical-surgical training (performed by centralized nurse educators) and 52 attending intensive care training (unit-based nurse educators). RNs needed to complete 2 days of online training through our learning management system (LMS): PowerPoint, e-Learnings, and WebEx training of our inpatient electronic medical record. RNs redeployed to medical-surgical units attended 2 hours of in-person intravenous (IV) pump training and COVID-related training, whereas RNs redeployed to the ICUs attended an additional 2 hours of in-person training on procedures, and had 1 precepted shift with an ICU nurse before stepping into the team-based role. A post-redeployment evaluation (Table 3) was completed via REDCap with 68 responses (57% overall response rate). Most redeployed RNs were from perioperative areas; 56% were redeployed to medical-surgical areas and 41% redeployed to intensive care areas. Results are shown in Table 3, and redeployment successes and areas for improvement are highlighted in Table 4.

COVID-19 has changed, not only the way nurses care for patients, but also the way that we educate and enhance the professional development of our nursing staff. It has also provided nursing with a unique opportunity to reimagine the best strategies to engage adult learners outside of the traditional didactic and skills-based classroom, when social distancing is required for everyone’s safety. Transferring PowerPoint lectures into a LMS can help meet the need of introducing topics, reviewing institution-specific policies, and other knowledge-based learning activities. The challenge remains in taking didactic learning objectives from the classroom and redesigning how they can be achieved in the virtual setting to improve critical thinking skills. The utility of artificial intelligence is the wave of the future to assess, deliver, and test the professional nurse learner. The goal is to intrigue as well as challenge the learner, both individually and within an interprofessional team, to effectively provide safe, quality care at the top of their licensure. The increased need for virtual and online nursing education is self-evident in a social distancing environment. Challenges to provide an interactive learning environment include: cost, access to technical talent, and connectivity issues (teaching less technical nurses how to use the new software programs, securely log in, and handle wireless connectivity issues). Table 2 lists pre–post COVID-19 learning management delivery methods that are currently being implemented.

NURSING RESEARCH AND PRACTICE IMPROVEMENT IN THE COVID-19 ENVIRONMENT

Despite the COVID-19 pandemic and difficulties associated with it, interprofessional collaboration has ignited innovations to sustain the health and safety of patients and front-line health care providers.

At the forefront of this flurry of new research and inquiry is the nurse scientist, who serves the multiple roles of generating new knowledge, supporting staff nurse curiosity in applying best practices, and testing new interventions. In the creation of new science, the nurse scientist team initiated and supported a number of innovative projects investigating the impact of COVID-19 on the interplay of physiology and psychology of health care providers. A nurse surveillance study was designed to provide point-of-care proteomics monitoring of inflammatory markers. Qualitative methods have been implemented to understanding the lived experience of nurses caring for COVID-19 patients. In addition, a study has been undertaken to investigate the impact of pandemic stressors on DNA function in nurses, physicians, and non-clinical staff.

Beyond designing research studies, nurse scientists have supported staff in innovative COVID-19 patient care improvement projects. With collaboration from pharmacy and IV team members, nursing teams have developed extended intravenous tubing, allowing for expedient changes in IV flows without the need to don and doff PPE, preserving scarce resources. As continuous use of PPE is expected as a viral spread mediation, wound ostomy and continence nurses
| Educational Area                          | Pre COVID-19 Learning Environment                                                                 | Post COVID-19 Learning Environment                                                                 |
|------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| **New-employee RN orientation**          | 6 days of in-person didactic lecture on hospital specific policies, procedures and practices, plus additional online modules to satisfy regulatory requirements | 3 days of online modules through our LMS, and just-in-time training on the floors for SPHM equipment training  
Next goal: Create online pre-recorded lectures for knowledge-based learning and introduction to topics, updated institution-specific policies and procedures with pre-and post-knowledge assessments-built in. |
| **New-graduate RN residency program**    | In-person didactic classroom lectures with hands-on simulation and skill application of scenario based-learning | Using a web-based conferencing platform to transition in-person lectures to interactive learning with breakout group activities built in. In-person skills are done by virtually reviewing the skills and setting up an office hours approach for those nurses that need 1-on-1 practice and clarification in a safe environment.  
Next goal: Creation of interactive online lectures for critical thinking development and assessment. These are shorter in length (no more than 20 minutes, using adaptive learning technology to assess knowledge, by creating clinical scenarios with Q&A pop-up boxes that drive clinical decision making). Live stream panel discussions and pro–con debates. Pre-recorded skills demonstration videos using a 360° camera in a simulated clinical setting. |
| **Nursing professional development programs (i.e., preceptor workshop)** | 8-hour day of in-person lecture with group activities to apply content in real-world situations | 4 hours of didactic content review through our LMS, followed by 4 hours of virtual group activities through a web-based conferencing platform to apply the content and enhance situational based learning and critical thinking.  
Next goal: Online knowledge assessment that allows for nurses to test out of certain knowledge-based didactic learning, and pre–post evaluation. |
| **Basic, pediatric, advanced cardiac life support training** | 4 to 8 hours of in-person training using AHA’s classroom content of practice while watching video approach, team dynamics, skill validation, and knowledge assessment of the overall content | 3 to 6 hours of online blended learning with interactive scenarios to improve clinical decision-making skills and knowledge assessments, followed by hands-on skills validation using ARC. Uses adaptive learning technology for learners to test out of certain content and tailor the learning based on their needs. |

*AHA, American Heart Association; ARC, American Red Cross; SPHM, safe patient handling and movement.*
contribute to national guidelines and made recommendations to prevent de novo skin injury in patients in the prone position.

The central and unit-based nurse educator teams have created and implemented several staff trainings to ensure patient safety in the prone positioning for intubated patients, as well as educating staff on self-proning for ambulatory patients known as “tummy time.” By validating a pediatric shortness of breath tool (Figure 2), nurses are empowering their COVID-19 patients by teaching them to complete 3 hours of tummy time every 8 hours. For those patients who are nonambulatory, patients are performing hourly incentive spirometry with programmed reminders utilizing the Alexa device and self-log by using a bar-code to access and document their incentive spirometry scores in REDCap.

Since the COVID-19 pandemic began, a race to find answers has been underway. The necessity of conducting research must be balanced with the burden

### Table 3. Redeployment Post-Evaluation Results

| Were the skills/competencies you possessed prior to redeployment useful in transitioning to team nursing in the inpatient units? | Medical-Surgical | Intensive Care Unit |
|---|---|---|
| Very useful | 34% | 25% |
| Useful/somewhat useful | 51% | 50% |
| Not useful | 3% | 0% |

| Did the redeployment training adequately prepare you to perform team nursing in the inpatient units? | Medical-Surgical | Intensive Care Unit |
|---|---|---|
| Well/very well | 46% | 43% |
| Somewhat well | 21% | 34% |
| Not at all | 4% | 9% |

| Was the training you received, while on the inpatient units, helpful in your ability to perform team nursing in those respective areas? | Medical-Surgical | Intensive Care Unit |
|---|---|---|
| Very helpful | 29% | 26% |
| Somewhat helpful/helpful | 34% | 54% |
| Not helpful | 8% | 17% |

### Table 4. Redeployment Successes and Areas for Improvement

| Areas of success in redeployment of team nursing model | Medical-Surgical | Intensive Care Unit |
|---|---|---|
| Education content | | |
| Access to online HS modules | | |
| Supportive educators | | |
| Grateful they were able to continue working by being redeployed | | |

| Future areas for improvement in redeployment of team nursing model | Medical-Surgical | Intensive Care Unit |
|---|---|---|
| Clearer communication about the redeployment process and expectations | | |
| More training about team nursing for the redeployed RN and the redeployment units | | |
| Collaboration between resource bank, nursing resources, and managers to improve communication to the redeployed RNs | | |
| More time for hands-on training prior to redeployment and on the inpatient units | | |
| Tailor training (HS and hands on training) to the redeployed RNs experience and background | | |
| Provide RNs with important resources such as policies, unit expectations, phone numbers, etc. | | |

*HS, HealthStream.*
of managing patient load for the frontline nurses. It is imperative that clinical research is well organized, thoughtfully coordinated, with ample support for both operational and clinical research activities. Nurse scientists play a key role in assisting non nurse investigators in the construction of studies with nurses as intended subjects.

SUMMARY AND CONCLUSIONS
During an unprecedented time, nurses have risen to the forefront across the United States and the world. RNs are on the frontline, redployed into unfamiliar practice environments; advanced practice nurses improve screening, diagnosis, and treatment, and work with nurse educators to ensure nurses remain updated on ever-changing patient care. Nurse scientists generate new knowledge, support staff nurse curiosity in applying best practices, and test new interventions. Future implications for nursing education as a result of the COVID-19 pandemic will be felt for years to come. The message is consistent: nurses are leading the way in 2020 to a better, healthier tomorrow.

REFERENCES
1. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020;395(10223):507-513.
2. Singh AK, Gupta R, Ghosh A, Misra A. Diabetes in COVID-19: prevalence, pathophysiology, prognosis and practical considerations. Diabetes Metab Syndr. 2020;14(4):303-310.
3. Simonnet A, Chetboun M, Poissy J, et al. High prevalence of obesity in severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) requiring invasive mechanical ventilation. Obesity (Silver Spring). 2020;28(7):1195-1199.
4. Kalligeros M, Shehadeh F, Mylona EK, et al. Association of obesity with disease severity among patients with coronavirus disease 2019. Obesity (Silver Spring). 2020;28(7):1200-1204.
5. Chowienczyk M, Reed Jr AL. Racial health disparities and Covid-19: caution and context. N Engl J Med. 2020;383(3):201-203.
6. Johns Hopkins University of Medicine. COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). Johns Hopkins Coronavirus Resource Center. 2020. Available at: https://coronavirus.jhu.edu/map.html. Accessed March 19, 2020.
7. World Health Organization. Global Surveillance for COVID-19 Caused by Human Infection With COVID-19 Virus: Interim Guidance. 2020. Available at: https://www.who.int/docs/default-source/coronaviruse/global-surveillance-for-covid-v-19-final200321-rev.pdf. Accessed April 4, 2020.
8. World Health Organization. WHO Coronavirus Disease (COVID-19) Dashboard. 2020. Available at: https://covid19.who.int/. Accessed March 19, 2020.
9. King A, Long L, Lisy K. Effectiveness of team nursing compared with total patient care on staff wellbeing when organizing nursing work in acute care wards: a systematic review. JBI Database System Rev Implement Rep. 2015;13(11):128-168.
10. Centers for Disease Control and Prevention. Non-pharmaceutical Interventions (NPIs). 2019. Available at: https://www.cdc.gov/nonpharmaceutical-interventions/index.html. Accessed March 28.
11. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395(10223):497-506.
12. Guo YR, Cao QD, Hong ZS, et al. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak: an update on the status. Mil Med Res. 2020;7(1):11.
13. Centers for Disease Control and Prevention. Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens for COVID-19. 2019. Available at: https://www.cdc.gov/
coronavirus/2019-nCoV/lab/guidelines-clinical-specimens.html. Accessed May 8, 2020.

14. Centers for Disease Control and Prevention. Information for Healthcare Professionals About Coronavirus (COVID-19). 2020. Available at: https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html#CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhealth-care-facilities%2Findex.html. Accessed April 4, 2020.

15. Alhazzani W, Moller MH, Arabi YM, et al. Surviving Sepsis Campaign: guidelines on the management of critically ill adults with coronavirus disease 2019 (COVID-19). Crit Care Med. 2020;48(5):854-887.

16. Grein J, Ohmagari N, Shin D, et al. Compassionate use of remdesivir for patients with severe Covid-19. N Engl J Med. 2020;382(24):2327-2336.

17. Horby P, Lim WS, Emberson J, et al. Effect of dexamethasone in hospitalized patients with COVID-19: preliminary report. medRxiv. 2020. Available at: https://www.medrxiv.org/content/10.1101/2020.06.22.20137273v1. Accessed May 8, 2020.

18. Law SY, Ooi SW, Rusli KDB, Lau TC, Tam WWS, Chua WL. Nurse-physician communication team training in virtual reality versus live simulations: randomized controlled trial on team communication and teamwork attitudes. J Med Internet Res. 2020;22(4);e17279.

19. Sheffield L, Sheppard B, Romero J, Krom Z, Chavez J, Johnson H. Pronation Therapy Training Video. 2020. Available at: https://www.youtube.com/watch?v=yb1ppe8Y-70. Accessed April 10, 2020.

20. Khan Fl, Reddy RC, Baptist AP. Pediatric dyspnea scale for use in hospitalized patients with asthma. J Allergy Clin Immunol. 2009;123(3):660-664.

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