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UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF NURSING PRACTICE

National Early Warning Score (NEWS) for COVID-19 infected Patients: A Clinical
Guidance Tool

by

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A Doctor of Nursing Practice Portfolio presented to the
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Abstract

Background: Coronavirus 2019 (COVID-19) presents with variable clinical manifestations from asymptomatic to life-threatening organ dysfunction. The National Early Warning Score, also known as NEWS, was initially developed to detect adult inpatient deterioration using existing physiological data and adverse clinical outcomes from 35,585 medical admissions. The NEWS guideline consists of six parameters: respiratory rate, pulse, oxygen saturation, temperature, systolic blood pressure, and level of consciousness.

Purpose: This project implemented NEWS guidelines to identify patients at high risk for deterioration with COVID-19.

Evidence-Based Interventions: The project included retrospective-prospective chart reviews for 100 patients diagnosed with COVID-19 from October 2020 to December 2020. The pre intervention data included an assessment of current practice among the clinic providers with a 1-question survey. The post intervention data with NEWS guidelines consisted of chart reviews for 100 patients from December 2021 to February 2022. Interventions in this project consist of primary care provider education on the NEWS guideline to detect clinical deterioration in acutely ill patients with a standardized approach.

Evaluation/Results: The pre intervention data group had 60 patients who met NEWS guideline criteria, with 51 having low scores. Nine patients met a high score of NEWS (≥ 7) with two Emergency Department (ED) referrals (22% referral rate). The post intervention group had 95 patients who met the NEWS guideline criteria with 82 having low scores; 13 patients met a high score of NEWS (≥ 7) with 13 ED referrals indicating a 100% referral rate. The project resulted in a 78% increase in ED referrals for patients meeting a high score criteria.

Implications: NEWS has the ability to serve as an adjunct in clinical decisions for COVID-19 infected patients in various clinical settings. The standardization of the NEWS guideline brings an opportunity for appropriate clinical intervention to change patient health outcomes.

Keywords: SARs, NEWS, COVID, National Guidelines

National Early Warning Score (NEWS) for COVID-19 infected Patients

COVID-19 is a communicable disease caused by a novel coronavirus, severe acute respiratory syndrome (SARS) CoV-2. The virus was first identified as the cause of an outbreak of respiratory illness in Wuhan Hubei Province, the People's Republic of China in December 2019. The novel virus spread quickly across countries, posing a serious threat to public health on a global scale. On March 11, 2020, the World Health Organization (WHO) declared the virus as a global pandemic. This provoked a massive activation of clinical research internationally. Healthcare systems were placed in unprecedented strain and non-pharmacologic interventions to counteract the spread of the COVID-19 outbreak.

Finding effective treatment strategies for patients and high-risk individuals was needed. The risk for severe illness from COVID-19 increased with age, requiring hospitalization and potentially leading to death (Centers for Disease Control [CDC], 2020). According to the CDC, 8 out of 10 COVID-19 deaths in the United States have been adults age 65 years of age and older. Approximately 80% of patients with COVID-19 have mild symptoms, which is essential to prevent disease progression (Davis et al., 2020).

Patients infected with severe SARS-CoV-2 exhibited symptoms from illness onset with a median duration of 7 days leading to multiple organ failure or acute respiratory distress syndrome (Su et al., 2021). There was also evidence of asymptomatic transmission in which an individual infected with COVID-19 was capable of spreading the virus to others before exhibiting symptoms. Considerable resources were focused on disease containment and inpatient mortality reduction but not addressing the ambulatory patients prior to hospitalization (McCullough et al., 2020).

Older adults and people with severe chronic medical conditions such as heart, lung, or kidney disease were also at higher risk for more severe COVID-19 illnesses. The need for rapid triage and early recognition in high-risk patients to prevent clinical deterioration was essential (Galassi & Schena, 2021). Increased COVID-19 complications commonly occurred with individuals having comorbidities: obesity (49.8%), hypertension (58.9%), diabetes (41.5%), and coronary vascular disease (34.5%; Ferdinand et al., 2020).

NEWS was initially developed to detect adult inpatient deterioration using existing physiological data and adverse clinical outcomes from 35,585 medical admissions (Prytherch et al., 2010). NEWS was based on a simple scoring system of physiological measurements already used in routine practice. The guideline measured six parameters: respiratory rate, pulse, oxygen saturation, temperature, systolic blood pressure, and level of consciousness (Kostakis et al., 2021).

A low score NEWS (1–4) prompted a change in assessment frequency for clinical monitoring or an escalation of clinical care. A RED score referred to a single extreme physiological parameter (e.g., hypoxia, hypotension) escalating the level of care. A medium score NEWS (5–6) or a RED score prompted an urgent review by a skilled clinician to assess for acute illness. A high score NEWS (≥ 7) prompted an emergency assessment by a clinical team, usually transferring the patient to a higher level of care (Smith, n.d.).

COVID-19 disease presented with variable clinical manifestations from asymptomatic to life-threatening organ dysfunction. Similar clinical manifestations with COVID-19 infection included elevated temperature, low systolic blood pressure, and increased respiratory rate, suggesting NEWS was appropriate for clinical screening (Kostakis et al., 2021).

Objectives

This project aimed to implement NEWS guidelines by identifying patients at high risk for deterioration with COVID-19 disease. Interventions comprised primary care provider (PCP) education on the NEWS guideline to detect clinical deterioration in acutely-ill patients with a standardized approach. Twelve providers working in urgent care or outpatient clinical site received this education. Patient screening criteria included ages 18 years and older diagnosed with COVID-19 infection. All providers received a one-on-one education at the beginning of the project. Provider education emphasized adhering to the NEWS guideline to identify clinical deterioration with COVID-19 disease. Education on the use of the guideline was reinforced monthly during staff meetings. All providers received a copy of the guidelines; guidelines were also available at the provider's station.

Methods

Pre intervention data included an assessment of current practice among the clinic providers with a survey. Questions included, *Do you follow a specific guideline for detecting clinical deterioration and potentially respiratory failure for COVID-19 infected patients? If so, which guideline?* The pre intervention included chart reviews analyzing 100 patients diagnosed with COVID-19 infection from October 2020 to December 2020.

Data collection included patient demographics (e.g., age, sex), NEWS criteria rating, patient referral to an emergency room, and diagnostic review (e.g., rapid COVID test, polymerase chain reaction [PCR], chest x-ray [CXR]). Post intervention data included the same questions and patient information from a chart review for 100 patients diagnosed with COVID-19 from December 2021 to February 2022.

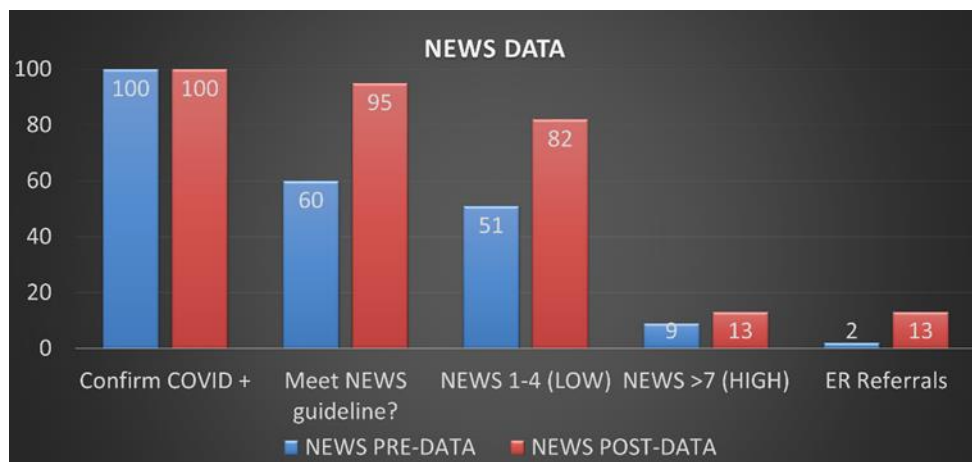
This project aimed to standardize the NEWS guideline for assessing clinical deterioration among COVID-19 infected patients to improve clinical guidance. The NEWS was intended to serve as an adjunct in clinical decisions in various clinical conditions and settings. Outcomes were improved provider adherence to the NEWS guidelines among all providers in an outpatient or urgent care setting.

Results

Figure 1 illustrates 200 pre-post patients confirmed with COVID-19 infection. Patients had an average age of 52 years (46 male, 54 female). A total of 60 patients met NEWS guideline criteria, 51 low scores (1–4) and 9 patients with a high score (≥ 7) with two ED referrals (22% referral rate). NEWS post intervention data consisted of 100 patients for three months. This group had an average of 59 years of age (49 male, 51 female). A total of 95 patients met NEWS guideline criteria, 82 with low scores, 13 with high scores, and 13 ED referrals (100% referral rate). This represented a 78% increase in ED referrals for patients meeting the criteria for a high NEWS score.

Figure 1

COVID-19 infection NEWS project data



Additional Results

The pre intervention group did not have monoclonal antibodies infusion treatments and COVID-19 vaccine access available. A total of 98 patients in this group received nutraceuticals and empiric multidrug treatments depending on the duration and intensity of symptoms. There was a total of 46 CXRs conducted with 34 abnormal results. In the post intervention group, 40 patients received at least one COVID-19 vaccine injection, 69 received monoclonal antibody infusion, and 87 patients received nutraceuticals and empiric multidrug treatments depending on the duration and intensity of symptoms. The post intervention group also had 26 CXRs conducted with 14 abnormal results.

Potential Cost-Benefit Analysis

There was no associated cost to provide education on the use of NEWS guidelines. The economic savings was the reduction of unnecessary testing in the urgent care and prompt ER referral for patients with a high NEWS score. Clinic cost savings per patient included a COVID-19 PCR test (\$100 each), a portable chest x-ray (\$35 each), for a total of \$135 per patient. The clinic could save \$13,500 for every 100 patients adequately referred to a higher level of care as assessed by the NEWS ≥ 7 criteria. Medi-Cal and other contracted insurance groups provided a flat-rate fee; some extra services are not reimbursed under flat-rate contracts.

Implications for Practice

NEWS has the ability to serve as an adjunct in clinical decisions for COVID-19 infected patients in various clinical settings. Providers in this project improved clinical outcomes by preventing patient deterioration and transferring patients to a higher level of care. Measurements of extreme value physiological parameters brought a change in practice resulting in significant

patient benefit. The standardization of the NEWS guideline offered an opportunity for appropriate clinical intervention to change patient health outcomes.

Conclusion

The pandemic forced a redesign of healthcare services with consequences on routine outpatient management. COVID-19 had a wide range of clinical severity from asymptomatic to fatal. This project demonstrated improved provider adherence to the NEWS guideline among all providers in the urgent care setting. In addition, providers improved clinical guidance for appropriate ED referral preventing clinical deterioration in patients and was a crucial element of patient safety and patient outcomes.

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