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PARKVIEW HEALTH

Background

The COVID-19 pandemic overwhelmed hospital and medical personnel globally. Conserving the use of critical care beds and ventilators was a concern. Subsequently, nurses looked for interventions to decrease or prevent patient deterioration and the need for intubation and transfer to critical care. One intervention identified by nursing staff was prone position for awake, nonintubated patients with COVID-19 in an attempt to improve oxygenation and prevent intubation.
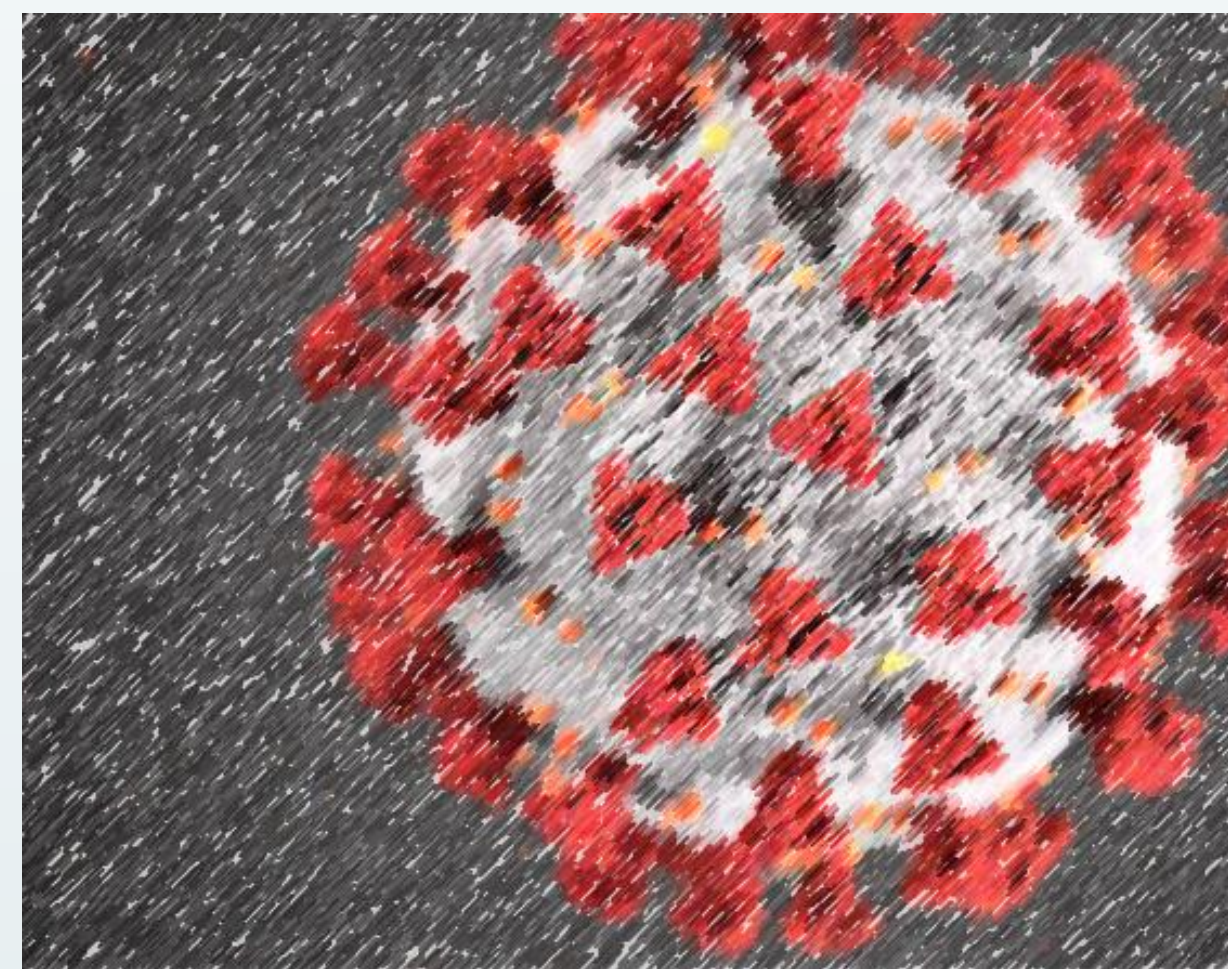
Introduction

Prone positioning improves oxygenation in patients experiencing respiratory distress. It is used to decrease mortality in mechanically ventilated patients diagnosed with acute respiratory distress syndrome. However, very little evidence has addressed use of prone positioning in non-intubated patients.

The purpose of this study was to assess the impact of early self-proning on oxygenation in patients who had or were suspected of having coronavirus disease (COVID-19). The goal was to improve oxygenation to avoid escalation to the intensive care unit (ICU) and the need for invasive mechanical ventilation.

Methodology

This descriptive study consisted of a patient cohort from one of four designated COVID-19 medical units at two hospitals (regional medical center, and a high-capacity community hospital). The study was submitted to the hospital's Institutional Review Board and due to low-risk for human subjects, was deemed exempt. A waiver of informed consent also was granted.
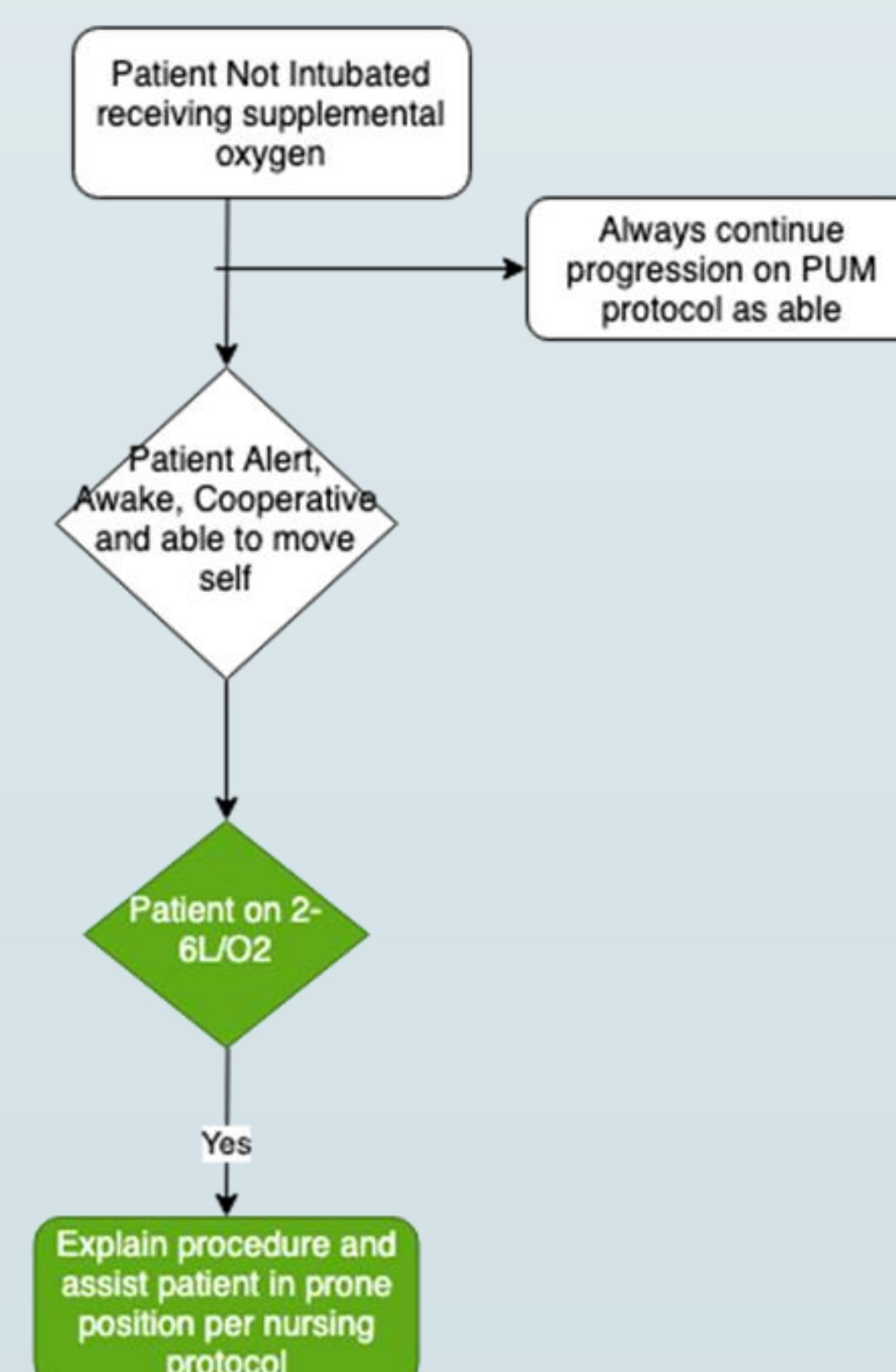
Data collected were limited to medical record reviews. Before the study, patient positioning fields were added to the electronic record to document self-proning.

The main outcome of interest was oxygenation. Other outcomes monitored were length of stay and escalation of care.

Patients diagnosed with COVID-19 or suspected were included in awake proning if greater than 18 years old, alert, awake, cooperative and able to reposition independently (prone/supine).

Patients excluded were unable to reposition independently (prone/supine), documented aspiration risk, nausea/vomiting, confused, combative, morbid obesity, pregnancy- 2nd trimester or more, limited neck range of motion, tracheostomy, laryngectomy, specific surgical and/or trauma precautions.

Data were collected on all patients who had at least one episode of self-proning and were not intubated. Few or no arterial gases were available for the sample. As a result, the key indicator for oxygenation was oxygen saturation (SpO2) using pulse oximetry.

```
Patient Not Intubated
receiving supplemental
oxygen
        |
        |--------> Always continue
        |          progression on PUM
        |          protocol as able
        v
Patient Alert,
Awake, Cooperative
and able to move
self
        |
       Yes
        v
Patient on 2-
6L/O2
        |
       Yes
        v
Explain procedure and
assist patient in prone
position per nursing
protocol
```

Follow Procedure Below For Placing Patient in Prone Position

Results

During the data collection period (April 1-May 31, 2020), there were 46 patients enrolled in this study. The total number of self-proning episodes was 180. The average number of times prone per patient was 4 (1-42). The average time in the prone position was 136 minutes (20-360).

Patients experienced an increase in oxygen saturation with prone position 97% of the time. The patients that did not experience an increase in O2 saturation, remained the same or decreased 1-2%, never a significant drop.

In only five episodes (3%) of self-proning was there a slight desaturation in oxygenation requiring increased oxygen needs while self-proning. All others either maintained oxygenation or were able to decrease oxygen amount delivered.

Of 46 patients, three (6.5%) were transferred to ICU but only one required intubation and mechanical ventilation after being prone on a medical floor.

Almost all patients were discharged to home (89.1 %), only 4 (8.7%) went to an extended care or rehab facility. One patient died while on the medical floor after the focus of their care was changed to palliative care, this patient was of advanced age.

	Average	Range
Age	57	(26-100)
Number of prone episodes per patient	4	(1-42)
Time in prone position	136 minutes	(20-360)
Oxygen saturation pre	93%	(84-100)
Oxygen saturation post	96%	(90-100)
Length of stay	7.1 days	(2-14)
Mortality	2%	

Conclusion

Even though this observational study had a small sample, the benefits displayed were positive and presented no risk to the patient. Nurses observed how quickly patients with COVID-19 became critically ill. The strength of the study is confirmation of the impact of nursing interventions to prevent further respiratory deterioration in medical patients. In the tradition of Florence Nightingale, during the year of the nurse and midwife, during a global pandemic; nurses raised questions, sought evidence-based intervention and implemented nurse driven interventions to prevent and improve their patients' outcomes. Additionally, due to the need for conservation of resources, nurses were able to utilize the intervention of self-proning with no additional equipment. This study demonstrated that by empowering nurses through evidence-based practice, they were able to provide significant positive outcomes for patients during a pandemic.

Acknowledgements

References

1. Bamford, P., Bentley, A., Dean, J., Whitmore, D., & Wilson-Baig, N. (2020). ICS guidance of the prone positioning for the conscious COVID patient 2020. https:// emcrit.org/wp-content/uploads/2020/04/2020-04-12-Guidance-for-consciousproning.pdf
2. Caputo, N.D., Strayer, R.J., & Levitan, R. (2020). Early self-proning in awake, non-intubated patients in the emergency department: A single ED's experience during the COVID-19 pandemic. Academic Emergency Medicine, 27(5), 375- 378.
3. Despres, C., Brunin, Y., Berthier, F., Pili-Floury, S., & Besch, G. (2020). Prone positioning combined with high-flow nasal or conventional oxygen therapy in severe COVID-19 patients. Critical Care, 24, Article No. 256. https://doi.org/10.1186/ s13054-020-03001-6
4. Ding, L., Wang, L., Wanhong, M., & Hangyong, H. (2020). Efficacy and safety of early prone positioning combined with HFNC or NIV in moderate to severe ARDS: A multi-center prospective cohort study. Critical Care, 24, Article No. 28.
5. Dong, W., Gong, Y., Feng, J., Bai, L., Qing, H., Zhou, B., … Xu, S. (2020). Early awake prone and lateral position in non-intubated severe and critical patients with COVID-19 in Wuhan: A respective cohort study. medRxiv.https://doi.org/10.1101/2020.05.09.20091454
6. Gattinoni, L., Carlesso, E., Taccone, P., Polli, F., Guérin, C., & Mancebo. J. (2010). Prone positioning improves survival in severe ARDS: A pathophysiologic review and individual patient meta-analysis. Minerva Anestesiologica, 76(6), 448-454.
7. Guérin, C., Reignier, J., Richard, JC., Beuret, P., Gacouin, A., Boulain, T., Mercier, E,… Ayzac, L. (2013). Prone positioning in severe acute respiratory distress syndrome. New England Journal of Medicine, 368(23), 2159-2168.
8. Sartini, C., Tresoldi, M., Scarpellini, P., Tettamanti, A., Carcò, F., Landoni, G., &Zangrillo, A. (2020). Respiratory parameters in patients with COVID-19 after using noninvasive ventilation in the prone position outside the intensive care unit. JAMA, 323(22), 2338-2340.
9. Scaravilli, V., Grasselli, G., Castagna, L., Zanella, A., Isgrò, S., Lucchini, A., …Pesenti, A. (2015). Prone positioning improves oxygenation in spontaneously breathing nonintubated patients with hypoxemic acute respiratory failure: A retrospective study. Journal of Critical Care, 30(6), 1390-1394 https://doi.org/10.1016/j.jcrc.2015.07.008
10. Sun, Q., Haibo, Q., Huang, M., & Yang, Y. (2020). Lower mortality of COVID-19 by early recognition and intervention: experience from Jiangsu Province. Annals of Intensive Care 10, Article No. 33. https://doi.org/10.1186/s13613-020-00650-2