Pronation Therapy in Covid-19 Patients
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Abstract: The Covid-19 pandemic has caused nearly 6 million deaths worldwide, and stressed healthcare facilities to their limits. As new information regarding Covid-19 is gained, healthcare professionals continue to implement new evidence-based techniques to improve morbidity and mortality of patients with severe disease. One such intervention this presentation will discuss is the use of pronation for Covid-19 patients who develop, or are at risk for developing ARDS. Pronation is a therapeutic intervention where the patient is placed down onto their abdomen in a face down position. The prone position increases oxygenation by improving the ventilation/perfusion mismatch and more evenly distributed pressure on the lungs. This presentation will elaborate on what pronation therapy is and how it helps, how and when healthcare professionals implement pronation therapy, what the current literature says about the implementation and benefits of pronation for Covid-19 patients, and the implications for future research.

What is COVID-19?
A very contagious disease caused by the SARS-CoV-2 virus. Covid-19 causes respiratory symptoms similar to a cold, a flu, or pneumonia (CDC, 2021). COVID-19 spreads quickly through droplets from your mouth or nose when you breathe, cough, sneeze, or speak (CDC, 2021). Some may have mild symptoms, and some can have severe symptoms. People with underlying medical conditions and the older population are at increased risk of severe illness from COVID-19 (CDC, 2021).

What is ARDS?
Acute Respiratory Distress Syndrome (ARDS) is “a serious lung condition that causes low blood oxygen” and is usually due to another disease or a major injury (NHLB, 2022). In ARDS, fluid builds up inside the tiny air sacs of the lungs (alveoli) and surfactant breaks down, preventing the lungs from properly filling with air and moving enough oxygen into the bloodstream and throughout the body resulting in scarring of lung tissue (NHLB, 2002). Symptoms of ARDS include shortness of breath, low blood oxygen, rapid breathing, and clicking, bubbling, or rattling sounds in the lungs (NHLB, 2022). ARDS is a major cause of death in patients with COVID-19 (PennMedicine, 2020).

What is Proning?
Proning is “placing patients in respiratory distress on their stomachs”, which was commonly used during the onset of the COVID-19 pandemic in March 2020 (PennMedicine, 2020). The prone position affects the distribution and volume of air in the lungs and can have a direct effect on the expansion or collapse of the alveoli (PennMedicine, 2020).

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What Does the Literature Say?
Findings & Conclusions
• One study found the need for intubation was significantly reduced in non-intubated Covid-19 patients (Beran et al., 2022)
• The study by Beran et al. (2022) found that mortality rates were significantly reduced for patients that used awake-proning (17.9% mortality) compared to patients that did not (25.7% mortality)
• A study compiling data on the use of awake-proning found there was a significant improvement in oxygenation, but these improvements did not translate to decreased rates of mortality and intubation (Pavlov et al., 2022)
• Adoesta et al. (2021) stated that mortality and intubation rates likely didn’t decrease with increased oxygenation because most ARDS deaths are related to multi-organ failure, not refractory oxygenation

Limitations
• Lack of large scale trials (Beran et al., 2022)
• Unpredictability of Covid-19: knowledge is constantly changing what is known about the virus, and how Covid-19 is treated (Adoesta et al. (2021)
• Lack of knowledge on the use of prone positioning on Covid-19 patients; patients with non-Covid-19 related ARDS are placed in the prone position for a significantly shorter period of time than Covid-19 patients (Adoesta et al. 2021)

Recommendations for Future Research
Implementation of repeated trials conducted on Covid-19 patients
• Conduct randomized control trials so results can be generalized to a broader population
• Conduct trials for Covid-19 patients with different disease severities
• Studies focused on how secondary complications can be prevented when implementing the prone position for Covid-19 patients

Prone Position for Intubated and Non-intubated Patients
• The prone position can be beneficial for both intubated and non-intubated patients
• Proning can be implemented for Covid-19 patients that have a high risk of intubation
• Non-intubated patients are able to self-prone, and change from a prone to supine position every 2 hours
• Intubated patients are more complex; requiring education, practice, and teamwork to reposition patients without causing injury
• Intubated patients typically stay in a prone position for 16-24 hours (Quan Le et al., 2020)

Criteria for Implementing the Prone Position for Covid-19 and ARDS Patients
• Severe ARDS (P/F ratio of <150,FiO2 > 60 on 5+ cm PEEP) (Bell, 2020)
• Awake-proning is indicated for Covid-19 patients in the presence of dorsal consolidation (a buildup of fluid in the lungs) (Chen, 2022)
• Covid-19 patients with a FiO2 ≥28% or requiring basic respiratory support to achieve a SaO2 of 92–96%, 88–92% for at risk for hypercapnic failure (Chen, 2022)

Benefits and Risks of the Prone Position for Covid-19 Patients
• Use of the prone position could relieve the shortage of ventilators and lessen the burden on the ICU during the pandemic (Chen, 2022)
• Secondary complications could occur while using the prone position (Airway obstruction, dislodgment of endotracheal tube, pressure-related skin injuries) (McCabe, 2020)
• Complications can be avoided by slowly alternating positions, and pressure relief interventions (McCabe, 2020)

References
PennMedicine. (2020). The Process of proning: the patient is placed on a flat bed,-face down (supine), the patient is then gently rolled from a supine to prone position (Chen & Quan Le, 2020).