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Prone Versus Supine in Mechanically Ventilated Patients

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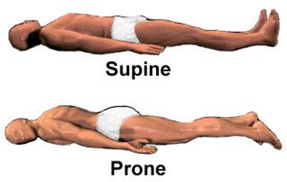
ABSTRACT

The purpose for this project is to determine whether the prone position is the best position for a patient who is being placed on a mechanical ventilator. Our research question is, in mechanically ventilated patients, does the use of the prone position promote better patient outcomes than the supine position? We are comparing recent studies on the benefits and complications that can arise in placing patients in the prone or supine position. We hypothesize that the prone position has greater benefits towards the patient's quality of care. Utilizing the library as a resource, provided us with relevant information related to our research.

INTRODUCTION

- Acute Respiratory Failure (ARF)
  - Accounts fatality for 33 to 37% of patients under MV
  - Age
  - Multiple Organ dysfunction
  - Pulmonary & Non-pulmonary illnesses
  - Acidosis
- Mechanical Ventilation
  - More than 75% of patients



http://www.medtrng.com/posturesdirection.htm

EVALUATION AND ANALYSIS

PRONE POSITION

- Method
  - Single-group clinical trial (Jahani et al., 2018)
    - Pretest & Posttest
    - Patients with ARF under MV in ICU
  - Investigated for three consecutive days
    - Supine position for 2 hours
      - ABG test
    - Prone for 2 hours
  - Improves O2 saturation
    - Days two & three day
- PRISMA
  - Preferred Reporting Items for Systematic Reviews & Meta-analysis(Cao et al., 2020)
  - 2264 Adults were recruited
    - Mortality
      - Reduced by 13%
- Acute Respiratory Distress Syndrome (ARDs)
  - Improves arterial oxygenation
  - Increases resting lung volume
  - Decreases dynamic lung strain
  - Increases lung volumes
  - Increases perfusion

Comparison of average sao2 for the patients before and after intervention during three consecutive

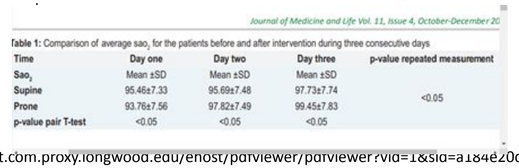


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Table 1: Comparison of average sao_2 for the patients before and after intervention during three consecutive days.

Time	Day one	Day two	Day three	p-value repeated measurement
Sao_2	Mean ±SD	Mean ±SD	Mean ±SD	
Supine	95.46±7.33	95.69±7.48	97.73±7.74	<0.05
Prone	93.76±7.56	97.82±7.49	99.45±7.83	
p-value pair T-test	<0.05	<0.05	<0.05	

http://web.b.ebscohost.com.proxy.longwood.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=a184e20d-3d2b-47b7-932b-8b04d690f373%40sessionmgr103

SUPINE POSITION

- Increased dorsal pleural pressure
- Compression of the lungs from surrounding organs (Proning during Covid-19, 2020).
- Development of atelectasis (Proning during covid-19, 2020).
- Ventilation and Perfusion mismatch (Proning during Covid-19, 2020)).

GUIDELINES TO PRONE POSITIONING

- **Recommended for patients with severe ARDs (AACN,2019)**
- **Criteria**
  - **<48 hours after onset of ARDs**
- **Pre-positioning**
  - **Communication**
  - **Procedure**
  - **Orders**
  - **Time**
- **Side-lying position**
  - **Pause & assess the patient**
- **Monitor Vital Signs**
- **Alternation of positioning**
  - **16 hours daily of PP (Dannette et al., 2018)**
  - **8 hours of SP**

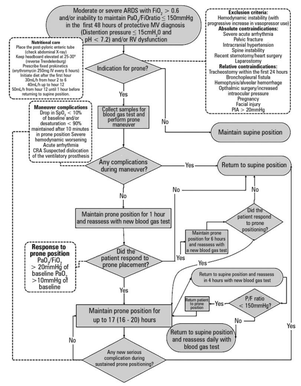

Table 2 showing a diagram of the prone position care rotocol.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5496747/

CONCLUSION

In conclusion, our group identifies that the prone position is the best position for a patient who is on a mechanical ventilator. The prone position is seen to have better patient outcomes with the mortality rate reducing to only 13%. Our group found that the prone position promotes oxygenation and perfusion. Laying the patient on their stomach prohibits gravity from compromising the patient's ability to breathe. Therefore, the prone position is seen to be more beneficial than the supine position for patients on a mechanical ventilator. Based on our findings our hypothesis made prior to conducting this study was correct. Future research could focus on whether the prone position is beneficial for patients who are not on a mechanical ventilator. With seeing the positive effects, the prone position has on mechanically ventilated patients, further research could identify whether this position could help other respiratory disorders and complications.

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