



Development of Pressure Injuries with the Prone Patient

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Problem

Background:

- Prone Positioning is a gold treatment for moderate to severe acute respiratory-distress syndrome (ARDS)
- A complication of prone position is the development of pressure injuries to bony prominences to the face, chest, and feet

Purpose: Evaluate the need for interventional care when placing a patient in prone position to help decrease exposure to pressure

PICO Question: Would utilizing a preventative intervention help to decrease a hospital acquired pressure injury (HAPI) to the ARDS/COVID patient in prone position?

Methods

Systemic search was carried out by CINHL, MEDLINE, and COCHRANE. The following search terms were used:

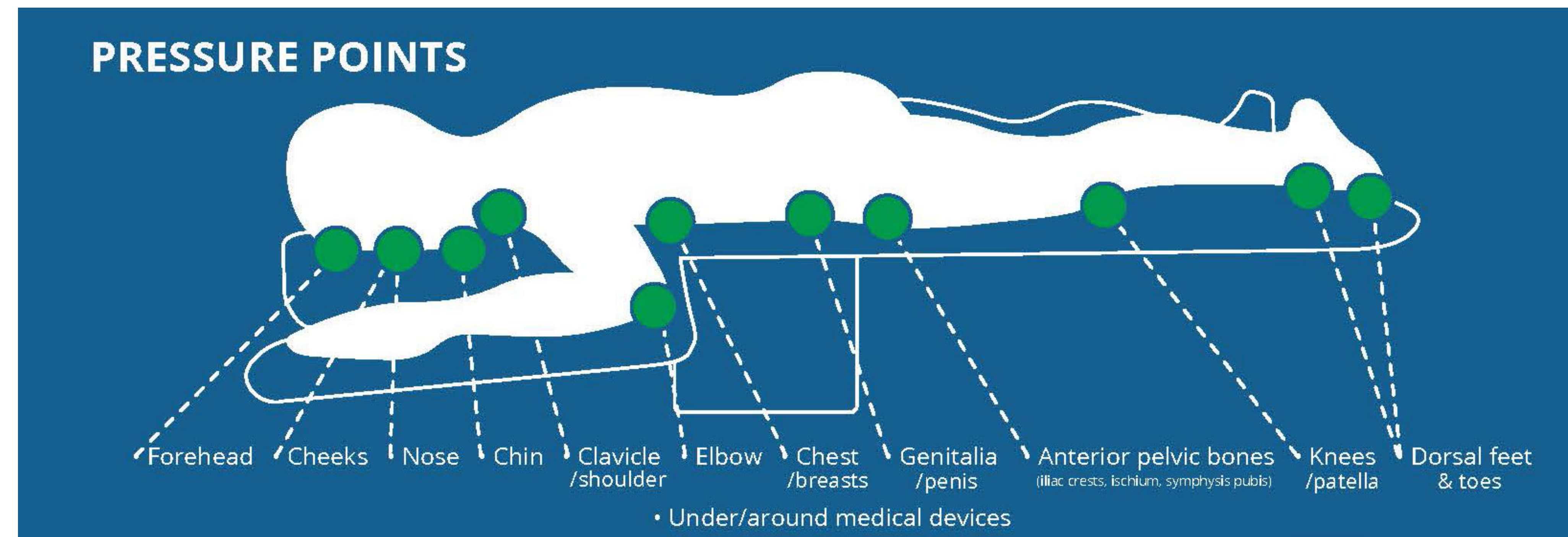
- pressure injury and ARDS
- pressure injury and prevention and ARDS
- pressure injury and COVID
- pressure injury and prone
- pressure injury and prone and COVID

Inclusion: peer reviewed journals published from 2019 to the present. English language only

Current Evidence

- HAPIs represent a global burden; with increased risk of prolonged hospitalization, costs, risk of sepsis, and risk of death
- Pronation occurs when rotating a patients body to lay face down; this therapy is a recommended intervention for severally ill patients with ARDS/COVID
- Patients may remain in prone position for up to 16 hours per day (Scholten et al., 2017)
- Prone positioning can increase the risk of HAPIs
- The average cost of a HAPI can average up to \$78,000 per patient per injury
- Use of a standardized policy/procedure can help to decrease HAPIs in the ICU setting
- Utilizing interventions such as dressings, offloading devices, and mattresses can help to decrease exposed pressure
- Use of a Certified Wound Nurse (CWN) can help to build policies, provide education, and assess patients with continuity of care

Exposed Pressure Points upon Prone Positioning



Recommendations/Implications

Practice Recommendation:

- Implementation of an evidenced based pressure injury prevention guideline/policy for the prone positioning of ARDS/COVID patients within the ICU

Research implications:

- Further investigation would be needed regarding type of foam/dressing as well as use of low-air loss mattress versus gel cushion

Nursing implications:

- Increased education for staff (starting with basic pressure injury Curriculum review)
- Use of certified wound nurse to help initiate Guidelines/policy
- Development of pressure injury prevention team to follow through with unit education and leadership

Appraisal Method

| Article | Level of Evidence | Aspects of Article |
|------------------------|-------------------|--|
| (Patton et al., 2021) | Level 1 | To evaluate the effects of prone positioning in relation to the development of pressure injuries in the ICU via meta-review |
| (Yu et al., 2021) | Level 1 | To summarize the pressure injuries related to COVID and the utilized preventative measures and treatments utilizing 16 studies via a systemic review |
| (Morata et al., 2021) | Level 3 | To evaluate outcomes associated with automatic versus manual prone positioning in 37 ARDS patients |
| (Johnson et al., 2022) | Level 4 | To determine if the use of a Certified Wound Nurse can help to decrease pressure injuries in ARDS/COVID patient with use of protocol and interventions |
| (Ryan et al., 2021) | Level 5 | To create a standardized protocol for the utilization of a manual prone positioning device for patients to decrease pressure injuries in ARDS patients |
| (Tacia et al., 2021) | Level 7 | To create a pressure injury packet to be used on prone positioning COVID patients to decrease development of pressure injuries |

Limitations

- Publication time was limited; COVID arrival to the U.S. in December 2019 to present
- Sample size was limited due to isolation precautions and shortage of precaution supplies
- Staging, measuring, and documentation was found to be inconsistent due to lack of wound education of the bedside nurse



References

- Alhazzani, W., Moller, MH., & Arabi, YM. (2019). Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease. *Intensive Care Med*, 46(5). Doi:10.1007/s00134-020-06055-5
- Johnson, C., Giordano, N. A., Patel, L., Book, K. A., Mac, J., Viscomi, J., Em, A., Westrick, A., Koganti, M., Tanpiengco, M., Sylvester, K., & Mastro, K. A. (2022). Pressure Injury Outcomes of a Prone-Positioning Protocol in Patients with COVID and ARDS. *American Journal of Critical Care: An Official Publication, American Association of Critical-Care Nurses*, 31(1), 34–41. <https://doi-org.unh.idm.oclc.org/10.4037/ajcc2022242>
- Morata, L., Sole, M. L., Guido-Sanz, F., Ogilvie, C., & Rich, R. (2021). Manual vs Automatic Prone Positioning and Patient Outcomes in Acute Respiratory Distress Syndrome. *American Journal of Critical Care*, 30(2), 104–112. <https://doi-org.unh.idm.oclc.org/10.4037/ajcc2021674>
- Patton, D., Latimer, S., Avsar, P., Walker, R. M., Moore, Z., Gillespie, B. M., O'Connor, T., Nugent, L., Budri, A., Brien, N. O., & Chaboyer, W. (2021). The Effect of Prone Positioning on Pressure Injury Incidence in Adult Intensive Care Unit Patients: A Meta-Review of Systematic Reviews. *Australian Critical Care: Official Journal of the Confederation of Australian Critical Care Nurses*, S1036-7314(21)00161-2. Advance online publication. <https://doi.org/10.1016/j.aucc.2021.10.003>
- Ryan, P., Fine, C., & DeForge, C. (2021). An Evidence-Based Protocol for Manual Prone Positioning of Patients with ARDS. *Critical Care Nurse*, 41(6), 55–60. <https://doi-org.unh.idm.oclc.org/10.4037/ccn2021900>
- Scholten, EL., Beitle, JR., Prisk, GK., & Malhotra, A. (2017). Treatment of ARDS with Prone Positioning. *Chest*, 151(1):215-224. doi: 10.1016/j.chest.2016.06.032.
- Tacia, L. L., Foster, M., Rice, J., & Elswick, D. (2021). Pressure Injury Prevention Packets for Prone Positioning. *Critical Care Nurse*, 41(3), 74–76. <https://doi-org.unh.idm.oclc.org/10.4037/ccn2021785>
- Team, V., Team, L., Jones, A., Teede, H., & Weller, C. D. (2021). Pressure Injury Prevention in COVID-19 Patients with Acute Respiratory Distress Syndrome. *Frontiers in medicine*, 7, 558696. <https://doi.org/10.3389/fmed.2020.558696>
- Yu, J. N., Wu, B. B., Feng, L. P., & Chen, H. L. (2021). COVID-19 Related Pressure Injuries in Patients and Personnel: A Systematic Review. *Journal of Tissue Viability*, 30(3), 283–290. <https://doi.org/10.1016/j.jtv.2021.04.002>