ICU Teaching Topics
Acute Respiratory Distress Syndrome (ARDS): Adjunct Treatments
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Objectives

1. Review various adjunct treatments for ARDS
2. Recognize clinical scenarios when specific treatments could be utilized
3. Understand the physiologic rationale for various treatments
4. Understand the potential risks of various treatments and how to weigh them against purported benefits

Resources

Essential Resources
1. Farkas, J. Internet Book of Critical Care. ARDS. Website: emcrit.org/ibcc/ards/#top
2. Guérin, C. Et al. Prone Position in ARDS Patients: Why, When, How and for Whom. Intensive Care Med. 2020; 46(12): 2385–2396. ~ PMID: 33169218
3. Mefford, B, et al. To Block or Not: Updates in Neuromuscular Blockade in Acute Respiratory Distress Syndrome. Ann Pharmacother. 2020 Sep;54(9):899-906. ~ PMID: 32111121
4. Hamilton Medical. P/V Tool® Pro User Guide. Website.

Supplemental Resources & Seminal Studies
Reviews
▸ Battaglini, D. Et al. Challenges in ARDS Definition, Management, and Identification of Effective Personalized Therapies. J Cain Med. 2023 Feb 9;12(4):1381. doi: 10.3390/jcm12041381. ~ PMID:36835919
▸ Meyer. Acute respiratory distress syndrome. Lancet 2021:398(10300):622-637 ~ PMID:34217425
Guidelines
▸ ESICM Guidelines on Acute Respiratory Distress Syndrome: Definition, Phenotyping, and Respiratory Support Strategies. (2023) ~ PMID: 37326646
▸ ATS / ESICM / SCCM Practice Guideline: Mechanical Ventilation in Adult Patients with Acute Respiratory Distress Syndrome (2017) ~ PMID: 28459336
▸ American Association for the Surgery of Trauma/American College of Surgeons Committee on Trauma Clinical Protocol for Management of Acute Respiratory Distress Syndrome and Severe Hypoxemia. J Trauma Acute Care Surg. 2023 Oct 1;95(4):592-602. ~ PMID: 37314843
Prone Positioning
▸ PROSEVA (2013) - Proning for ARDS ~ PMID:23688302
▸ PRONECMO (2023) - Proning for ARDS while on ECMO ~ PMID:38038395
Paralysis
▸ ACURASYS (2010) - Early paralysis in ARDS~ PMID:20843245
▸ ROSE (2019) - Early paralysis in ARDS. ~ PMID:31112383
Recruitment Maneuvers
▸ Brower, et al. - Recruitment Maneuvers and High PEEP in ARDS. (2003) ~ PMID:14605529
▸ ART - Recruitment Maneuver in ARDS. (2017) ~ PMID:28973363
▸ PHARLAP - Recruitment Maneuvers in ARDS. (2019) ~ PMID:31356105
▸ Chen, et al - Recruitment-to-Inflation Ratio. 2020. ~ PMID:31577153

Case

A 52-year-old female with a history of DM2 (metformin, semaglutide), 30 pack-year smoking history, HTN (metoprolol, HCTZ) and obesity (BMI=42) underwent an emergent laparoscopic cholecystectomy. Upon induction, she suffered significant aspiration. An emergent bronch was performed and able to suction significant gastric contents; however, she was unable to be extubated at the end of the case due to her oxygenation needs. She was

"The needs of the patient come first."

left intubated with lung protective settings. 17 hours later she remains intubated with the following ventilator settings and labs:
Mode: (S)CMV
VT:370 (6mL/kg)
PEEP:12
Pplat:32
DP:20
RR:26
FiO2:80%.
ABG: 7.18/34/73/13/-13.

Key Questions & Discussion Points

1. Describe the cardiopulmonary changes after placing a patient in a prone position. What changes would you expect to see in lung mechanics and ventilator parameters on the ventilator?
2. What are the various complications that can occur with prone positioning, and how do you mitigate each of them?
3. When and how long should proning be done to maximize its effectiveness while minimizing its risks?
4. What are the purported benefits of paralysis for ARDS management? What do they offer that simply blunting the respiratory drive with increased sedation does not?
5. What medications are available to achieve paralysis and what are the benefits and drawbacks to each? Which agent will you choose, and how will you administer it?
6. What are the physiological benefits of recruiting a lung back to FRC from a diseased, collapsed state?
7. How do you determine if a lung is recruitable?
8. Describe different types of recruitment maneuvers and the arguments for each? Which type would you employ and why?
9. Describe how you obtain a pressure-volume curve on the Hamilton G5? What parameters do you select?
10. You obtain the P/V loop below on your patient. What would be your next step and why?
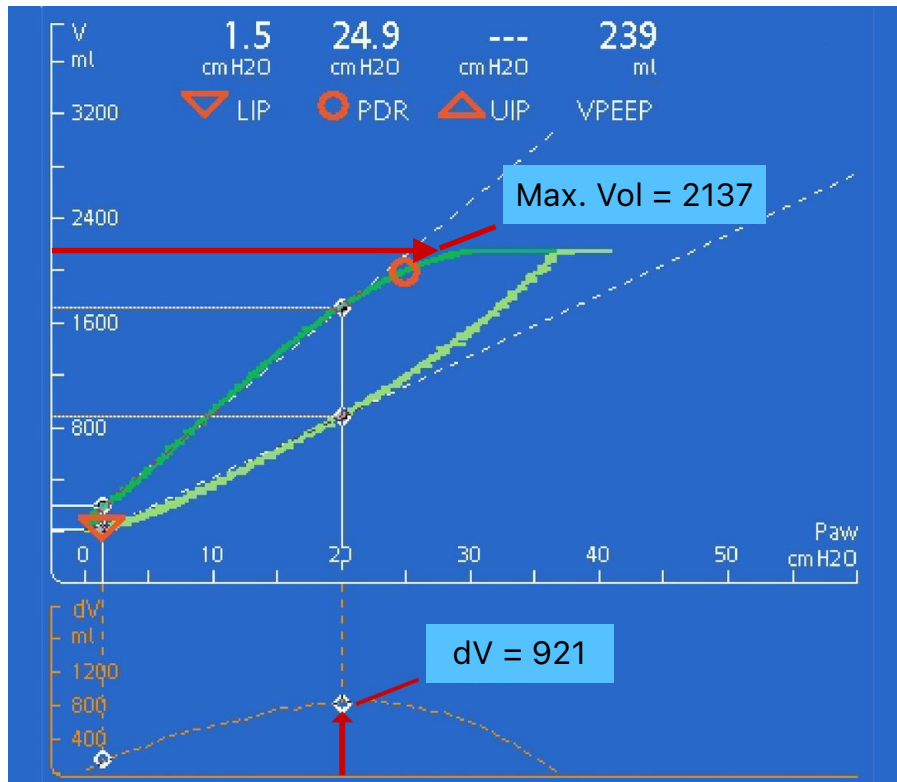
11. What indicates that you successfully recruited lung?
12. What do you monitor during a recruitment maneuver to determine if you are causing harm?

Reflection Questions

1. Describe a specific example of something you learned from this discussion that you probably would not have learned on your own.
2. Describe a specific concept that is still not entirely clear to you. If all concepts are clear, what clinical questions remain unanswered on this topic that warrant further study?
3. Suggest one practical change that would improve this learning experience for you.