Management of Hanging and Drowning Victims

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Evidence-Based Lecture with Clinical Guidelines and References

Introduction

- This lecture discusses evidence-based management of hanging and drowning victims, focusing on pathophysiology, resuscitation, complications, and outcomes (WHO, 2023).

Pathophysiology of Hanging

- Hanging leads to cerebral hypoxia from vascular obstruction and airway compromise. Mechanisms include carotid artery compression, jugular venous obstruction, and vagal stimulation (Byard, 2021).

Initial Assessment – Hanging Victims

- Assess airway, breathing, circulation (ABCs). Prioritize cervical spine immobilization. Look for laryngeal trauma, facial petechiae, and neurological deficits (Hsu et al., 2022).

Management of Hanging Victims

- Secure airway early, provide oxygenation, treat hypoxia and acidosis. Intubation may be required. Consider CT angiography for cervical injuries (Kanchan et al., 2020).

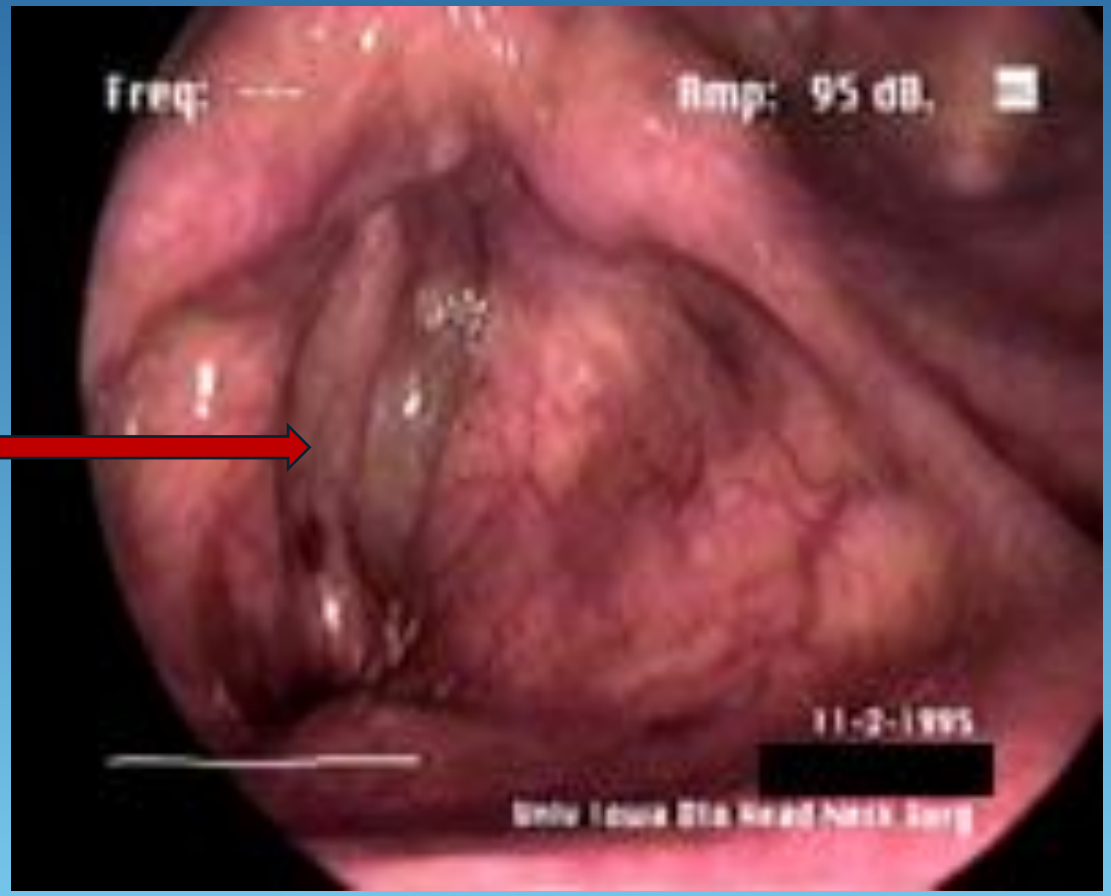
These can be difficult Airways to Mange

- Fracture Hyoid bones
- Unstable neck Fractures
- Laryngeal edema
- Fractures thyroid and criocoid cartilage
- Fractured trachea

- Approach all of these as if they are incredibly difficult intubation

Airway swelling from Hanging

Vocal Cords?



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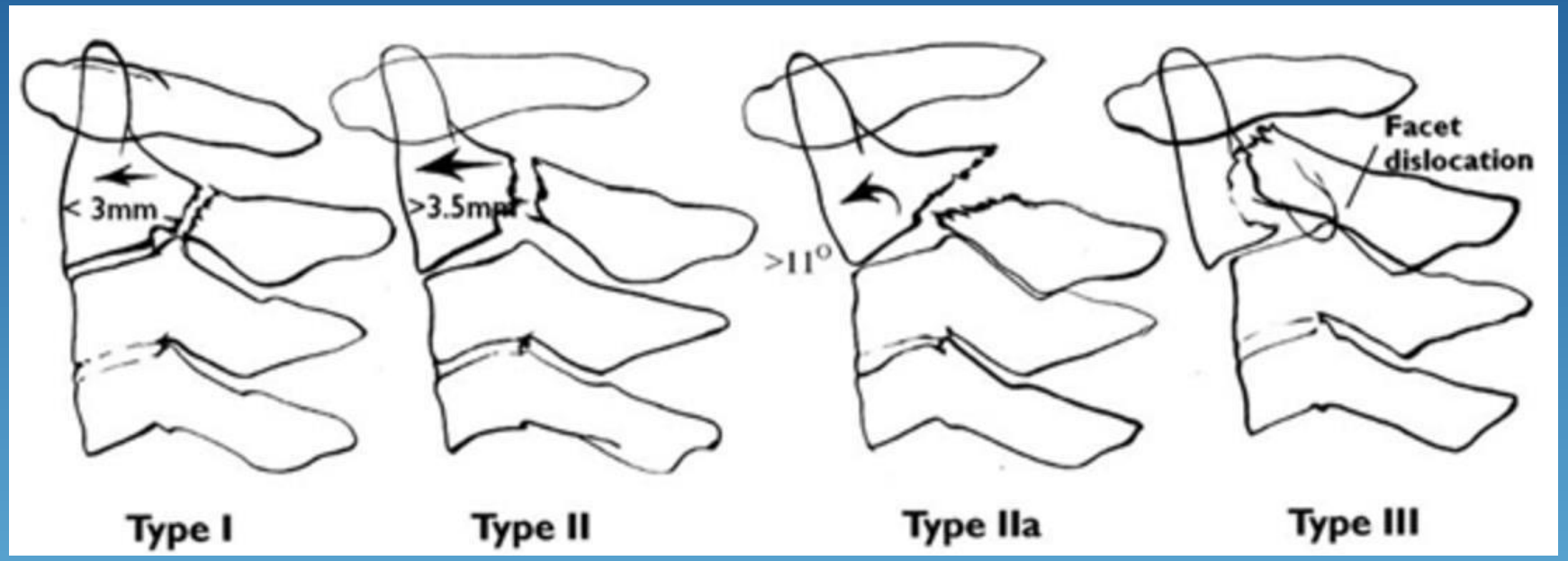
Hangman's Fracture

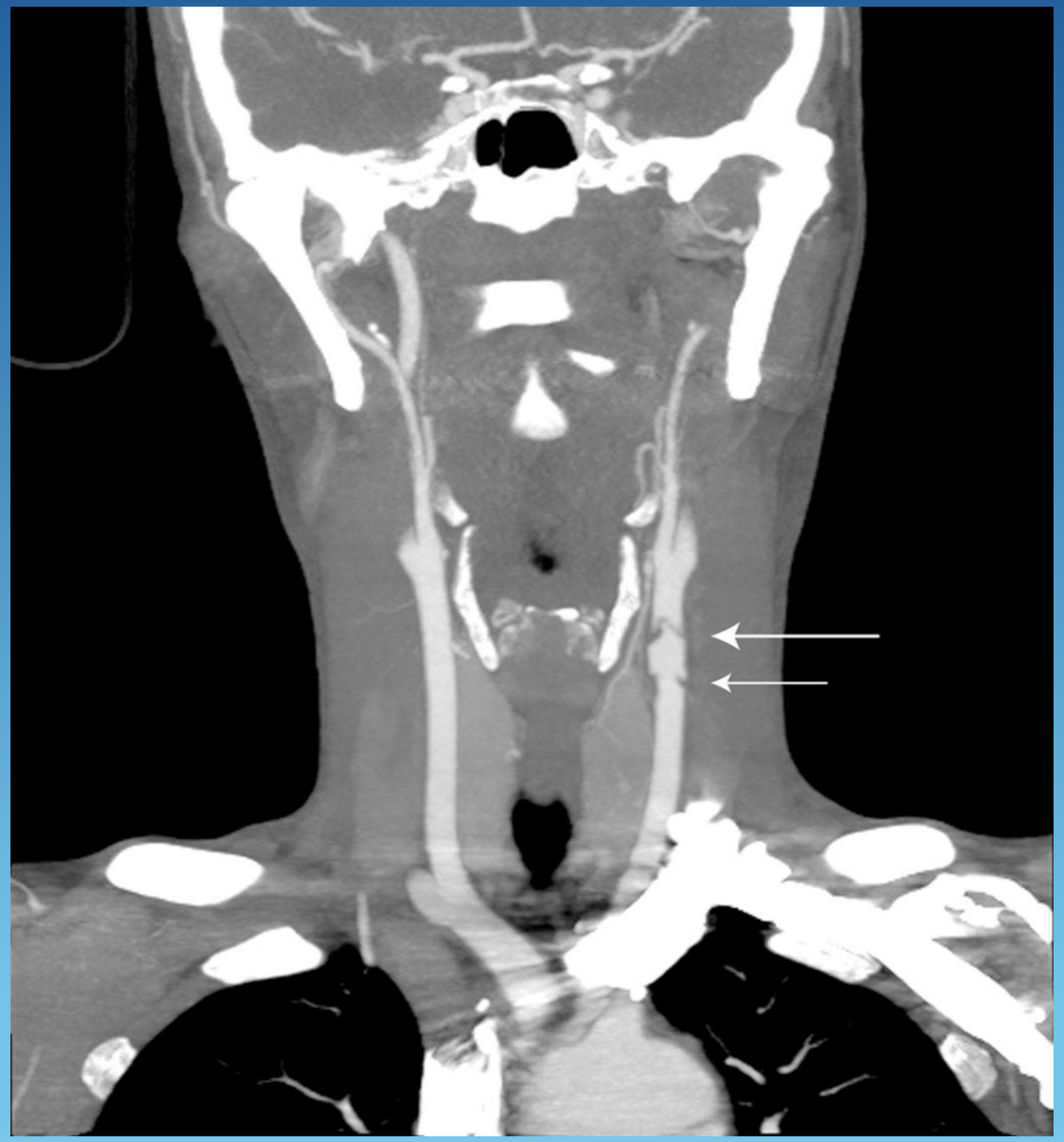


A "hangman's fracture" is a bilateral fracture of the C2 vertebra that can cause death by damaging the spinal cord, which may paralyze the respiratory muscles. While it is often associated with judicial hanging, the actual cause of death in many hangings is from other injuries like cerebral ischemia due to carotid artery compression or rupture. A hangman's fracture is often the result of a sudden, forceful hyperextension of the neck, which can occur in motor vehicle accidents, falls, or sports, as well as in hangings

Complications of Hanging

- Post-hanging cerebral edema, ARDS, and anoxic brain injury are common. Prognosis depends on downtime and neurologic status at arrival (Sauvageau & Boghossian, 2019).

Carotid Dissection

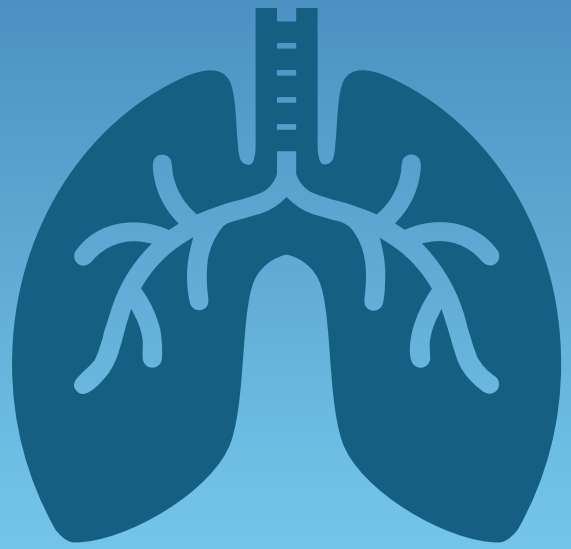


Best Practices: Hanging Victims

Title: Best Practices – Hanging Victims
Content (bullets):

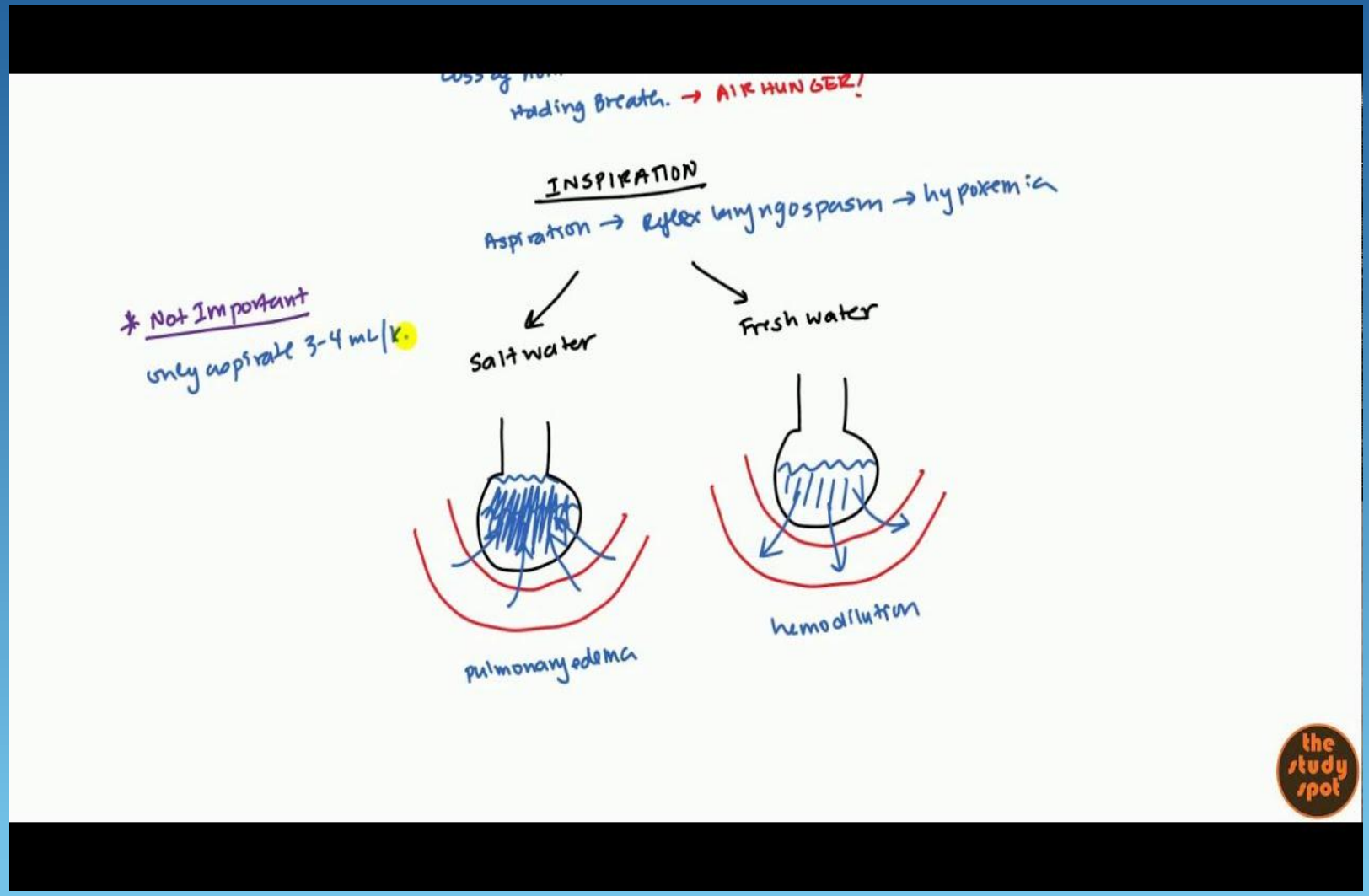
- ✅ Ensure **scene safety** and **rescue the patient** promptly (StatPearls, 2023).
- ✅ **Immediate assessment of airway, breathing, and circulation (ABC)**; start CPR if pulseless.
- ✅ **Cervical spine protection**: use collar if trauma suspected.
- ✅ **Airway management**: early oxygenation; consider intubation or cricothyrotomy if laryngeal trauma is severe (Hsu et al., 2022).
- ✅ Rapid transport to hospital with **pre-notification of ED**; provide clear handover of mechanism and interventions performed.

Pathophysiology of Drowning



- Drowning is respiratory impairment from submersion in liquid. Freshwater leads to hypotonic fluid absorption, while saltwater causes hypertonic pulmonary edema (Szpilman et al., 2018).

Saltwater vs fresh water



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Initial Management – Drowning

- Rescue breathing at the scene, remove from water, initiate CPR if no pulse. Avoid Heimlich maneuver. Focus on airway clearance and oxygenation (Tipton & Golden, 2021).

Hospital Management – Drowning

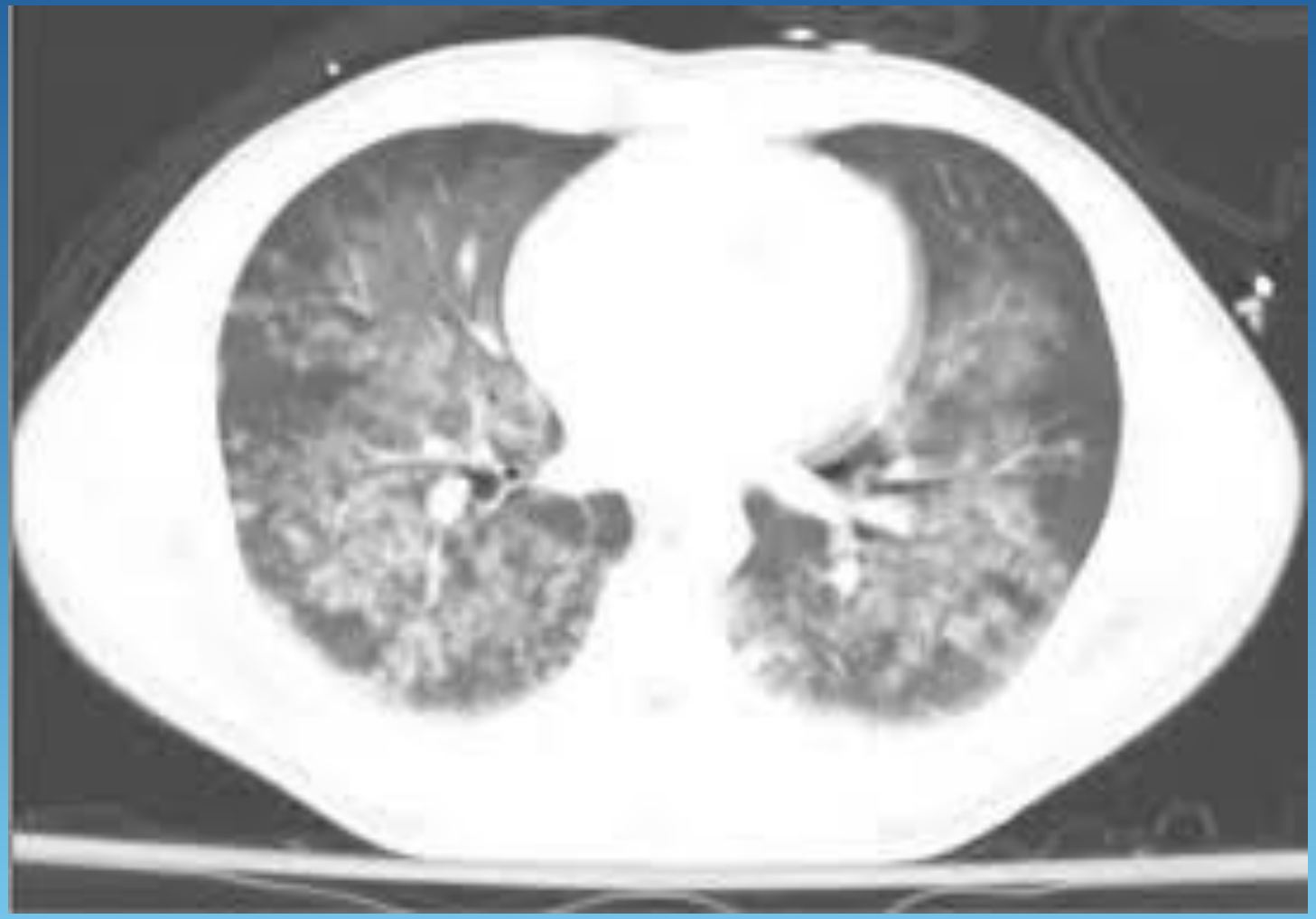
- Monitor for ARDS, aspiration pneumonia, and hypoxic brain injury. Use warmed humidified oxygen, mechanical ventilation, and targeted temperature management (Peden et al., 2023).

Differences Between Freshwater and Saltwater Drowning

- Freshwater absorption causes hemodilution and hyporkalemia; hemolysis and lysis from the hypotonic water

- Saltwater causes fluid shifts into alveoli, leading to hypovolemia and pulmonary edema (Claesson et al., 2021).

Pulmonary Edema from Drowning



Post-Resuscitation Care

- Targeted temperature management, seizure control, and management of cerebral edema are key. Use neuroprognostic tools to guide outcomes (Lindner et al., 2022).

Respiratory failure leads to cardiac arrest in children

Immediate signs of cardiac arrest

- **Unconsciousness:** The child is not awake or responsive.
- **No pulse or breathing:** You cannot feel a pulse or see/hear any normal breathing.
- **Sudden collapse:** The child suddenly falls or becomes limp.
- **Shortness of breath or gasping:** The child is unable to breathe properly or is only gasping.
- **Dizziness or lightheadedness:** The child appears unsteady or faint.

Complications and Prognosis

- Complications: ARDS, cardiac arrhythmias, anoxic brain injury. Prognosis depends on submersion time, initial GCS, and ROSC duration (Quan & Bierens, 2022).

Public Health and Prevention

- Prevention involves education, swimming lessons, supervision, and water safety regulations. Hanging prevention focuses on mental health support (WHO, 2023).

Summary

- Both hanging and drowning share hypoxic-ischemic injury as the final common pathway. Early resuscitation, targeted management, and neuroprotection improve survival.

Best Practices Drowning

- **Best Practices: Drowning Victims**
- **Title:** Best Practices – Drowning Victims
  Content (bullets):
- ✅ **Immediate rescue and removal from water**; ensure rescuer safety (AHA/ERC, 2024).
- ✅ **Rescue breaths first** for apneic victims; start CPR if pulseless.
- ✅ Administer **high-flow oxygen**; provide ventilatory support as needed (Szpilman et al., 2018).
- ✅ Assess for **hypothermia**; initiate active or passive warming.
- ✅ Rapid transport to hospital; **notify ED for potential ICU care** if severe hypoxia or cardiac arrest occurred.

References

- 1. WHO. Drowning Prevention, 2023.
- 2. Byard RW, 2021.
- 3. Hsu et al., 2022.
- 4. Kanchan et al., 2020.
- 5. Sauvageau & Boghossian, 2019.
- 6. Szpilman et al., 2018.
- 7. Tipton & Golden, 2021.
- 8. Peden et al., 2023.
- 9. Claesson et al., 2021.
- 10. Lindner et al., 2022.
- 11. Quan & Bierens, 2022.

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