
Improved Outcomes of Patients with Inhalation Injury after Implementing a Standard Nebulizer Cocktail

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(Scope of inhalation injury, relevance to trauma)

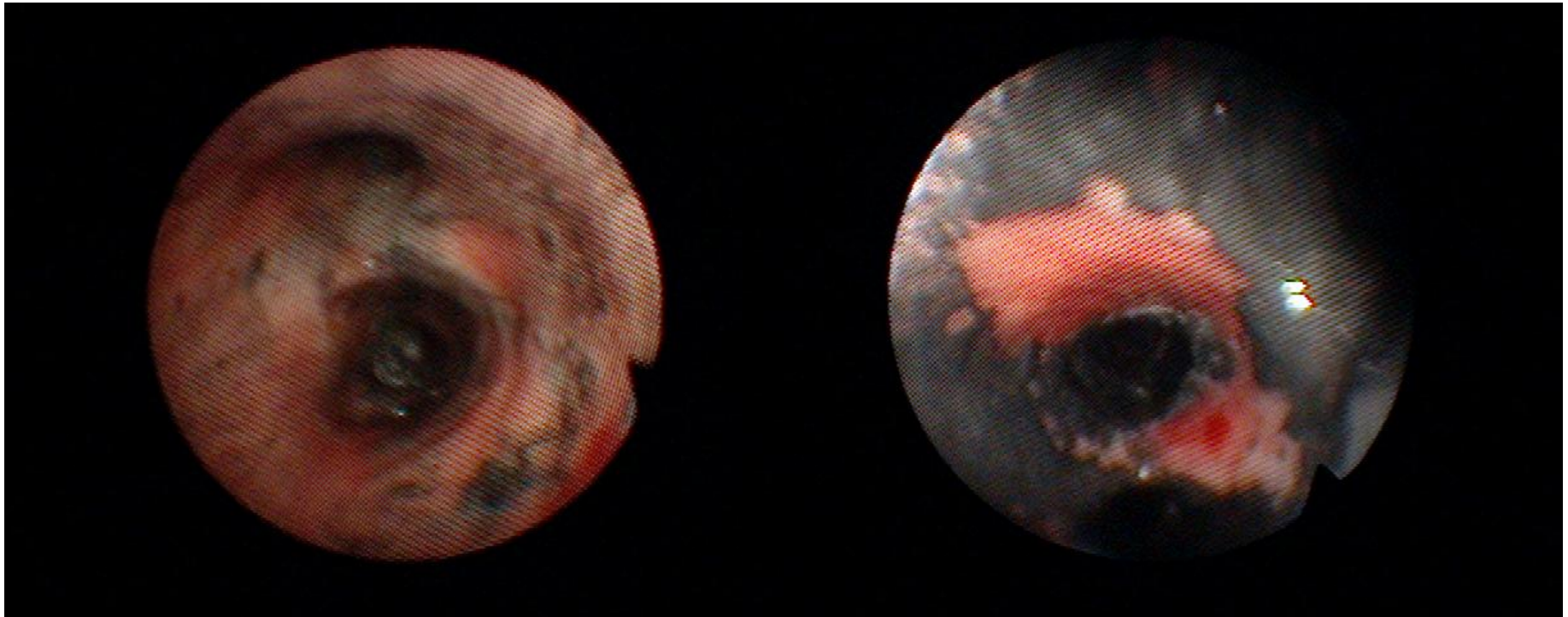


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Scope of inhalation injury, relevance to trauma



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Pathophysys of inhalation injury



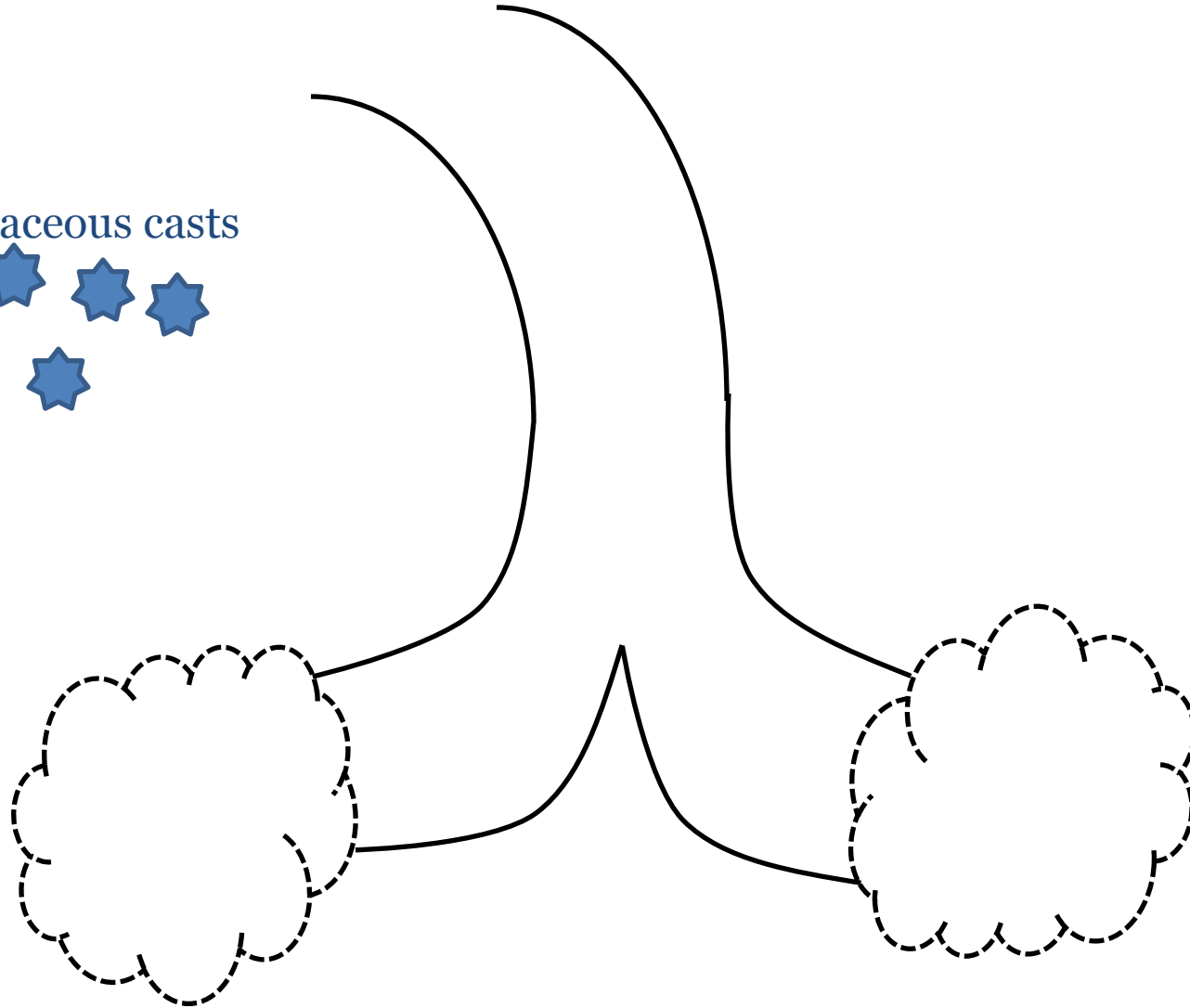
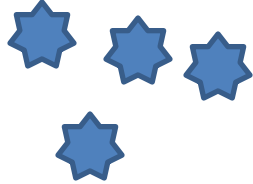
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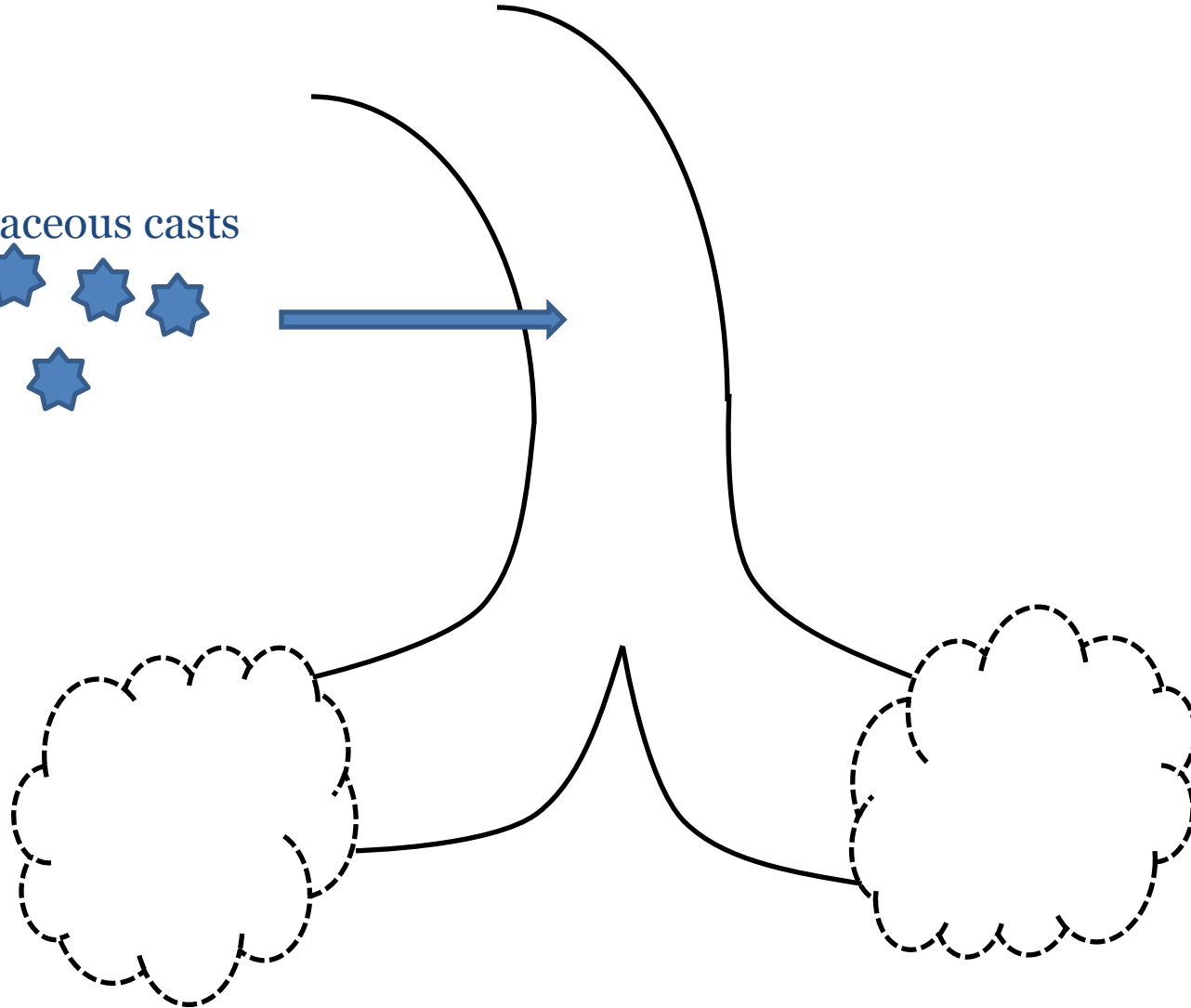
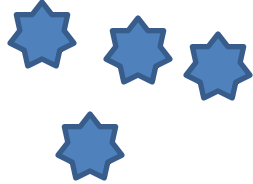
Pathophysiology

Proteinaceous casts



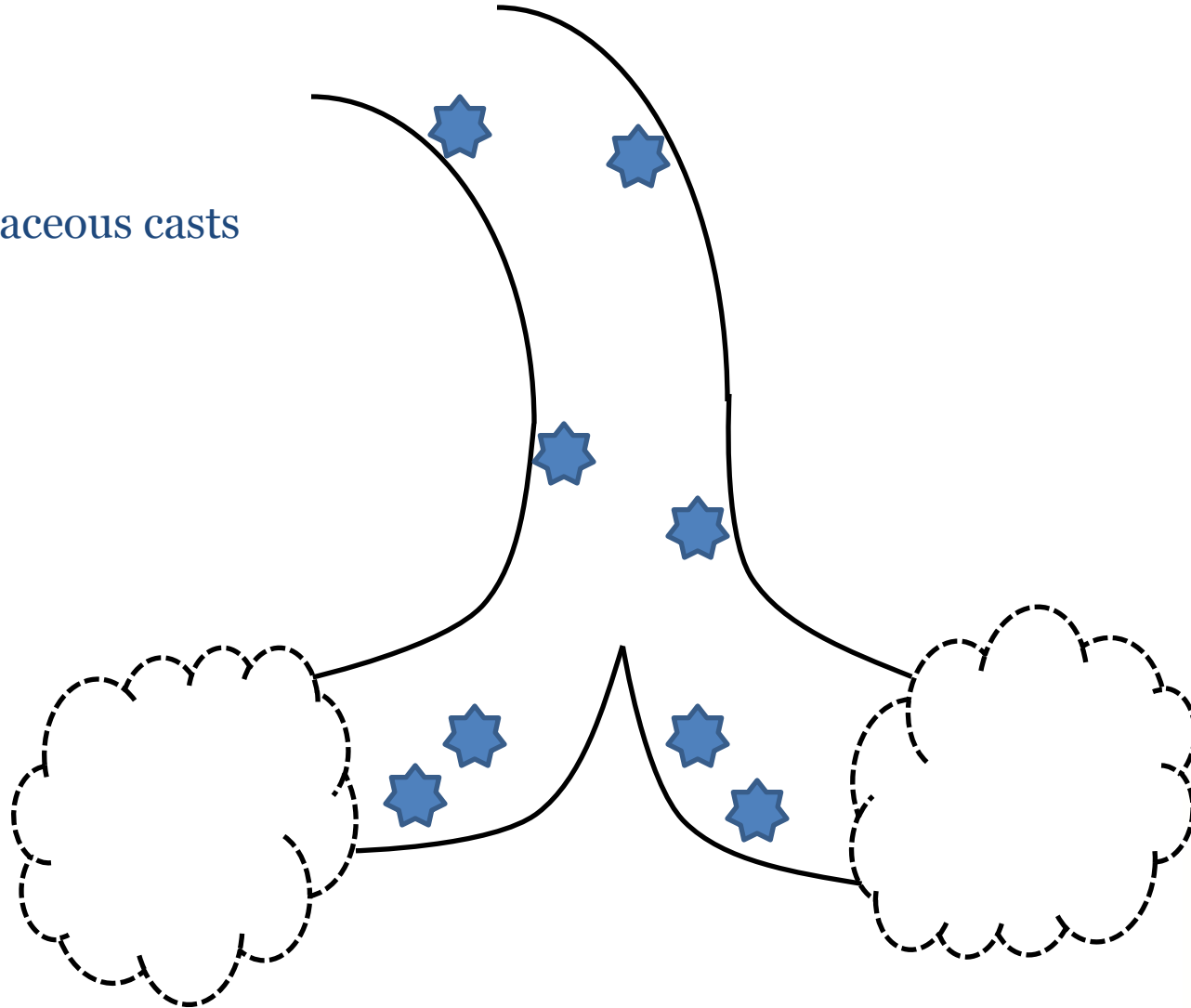
Pathophysiology

Proteinaceous casts



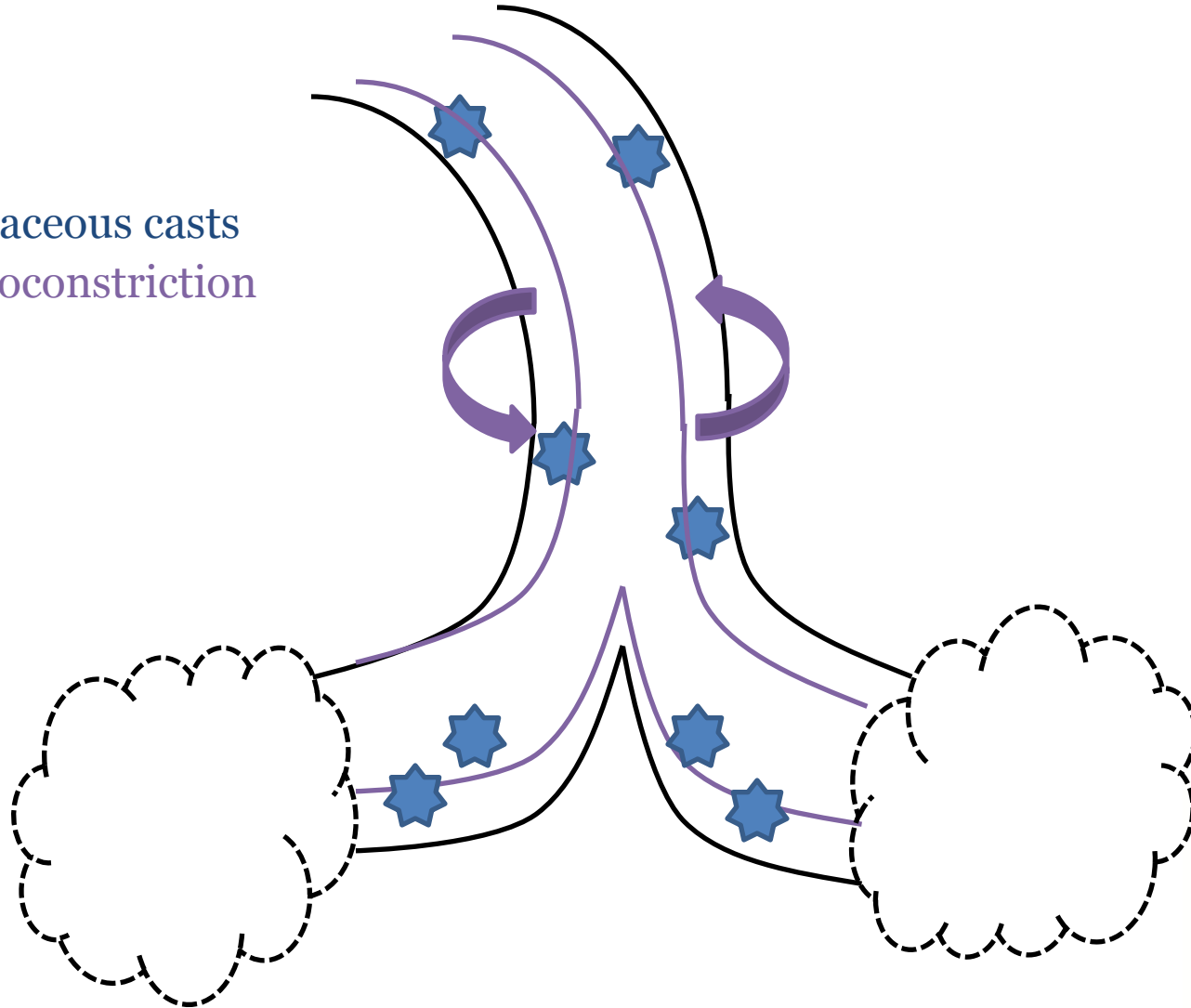
Pathophysiology

Proteinaceous casts



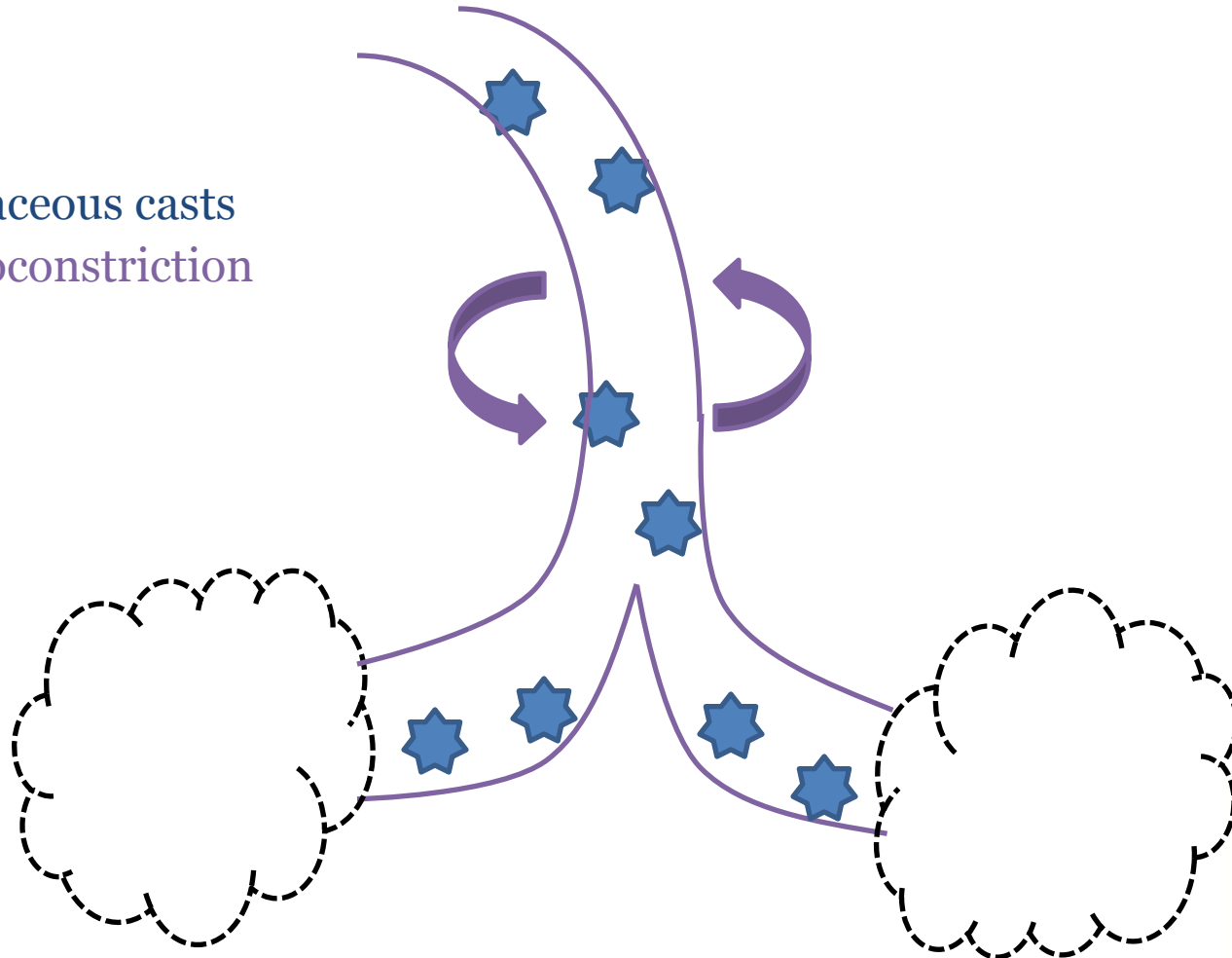
Pathophysiology

Proteinaceous casts
Bronchoconstriction



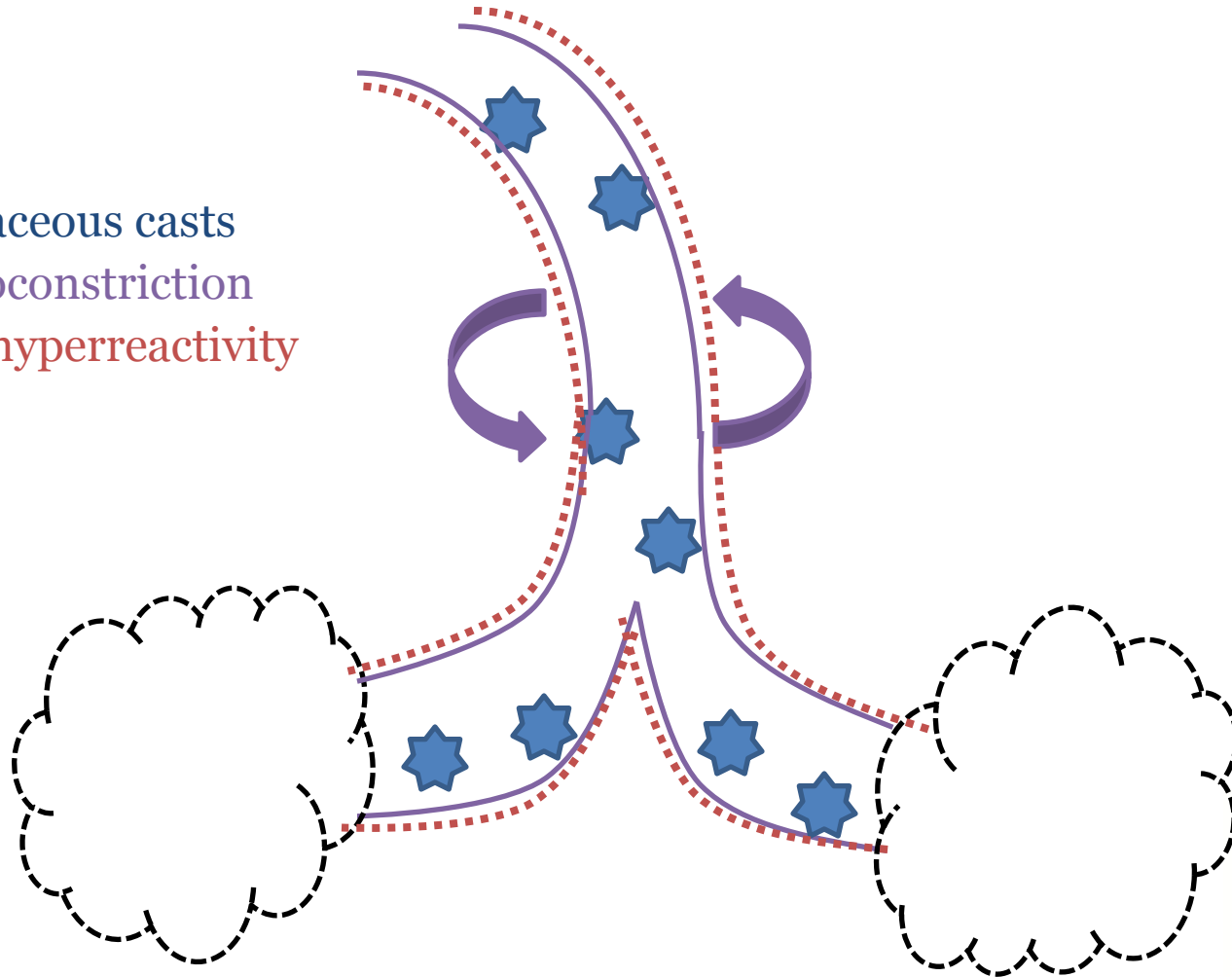
Pathophysiology

Proteinaceous casts
Bronchoconstriction



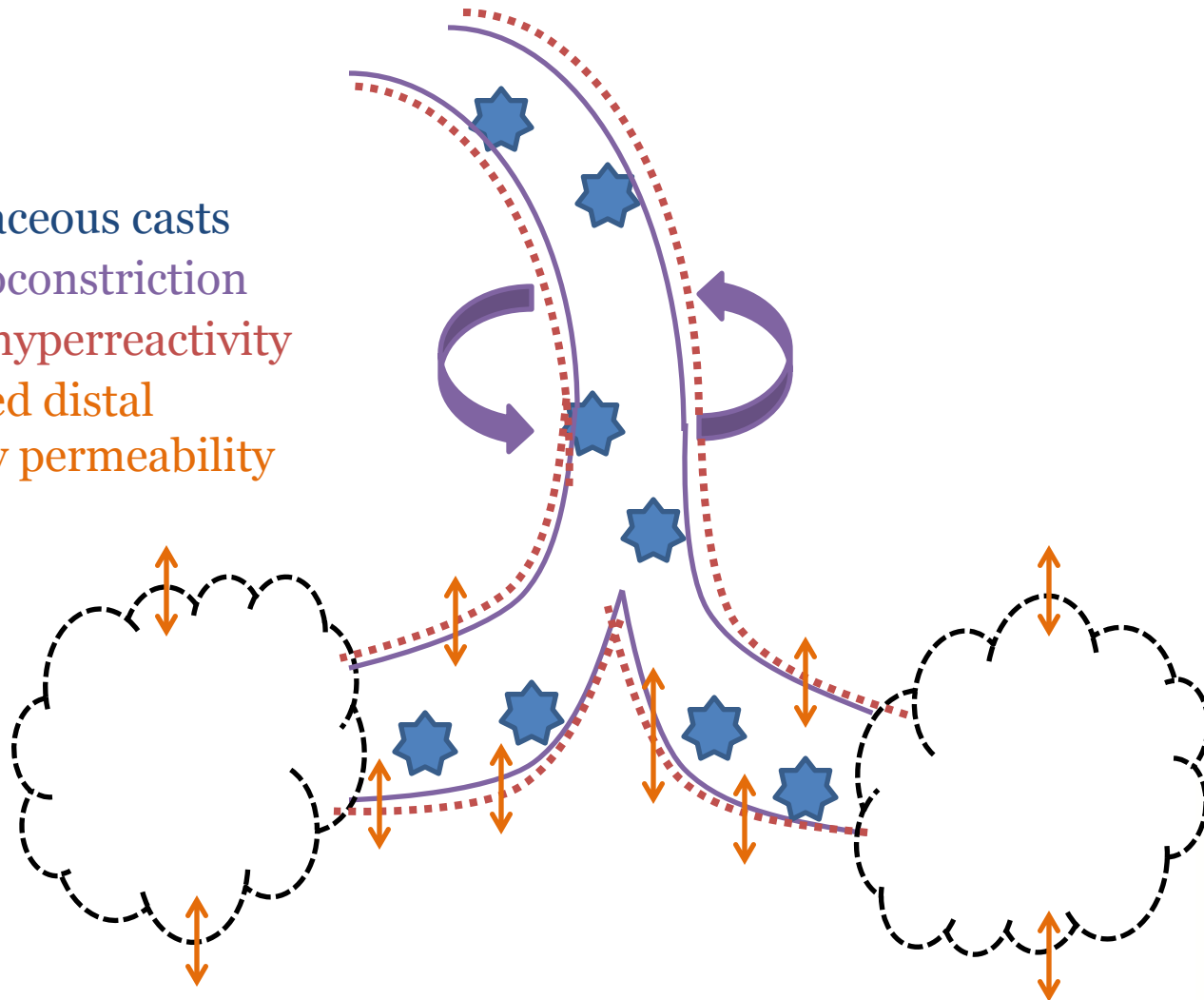
Pathophysiology

Proteinaceous casts
Bronchoconstriction
Airway hyperreactivity



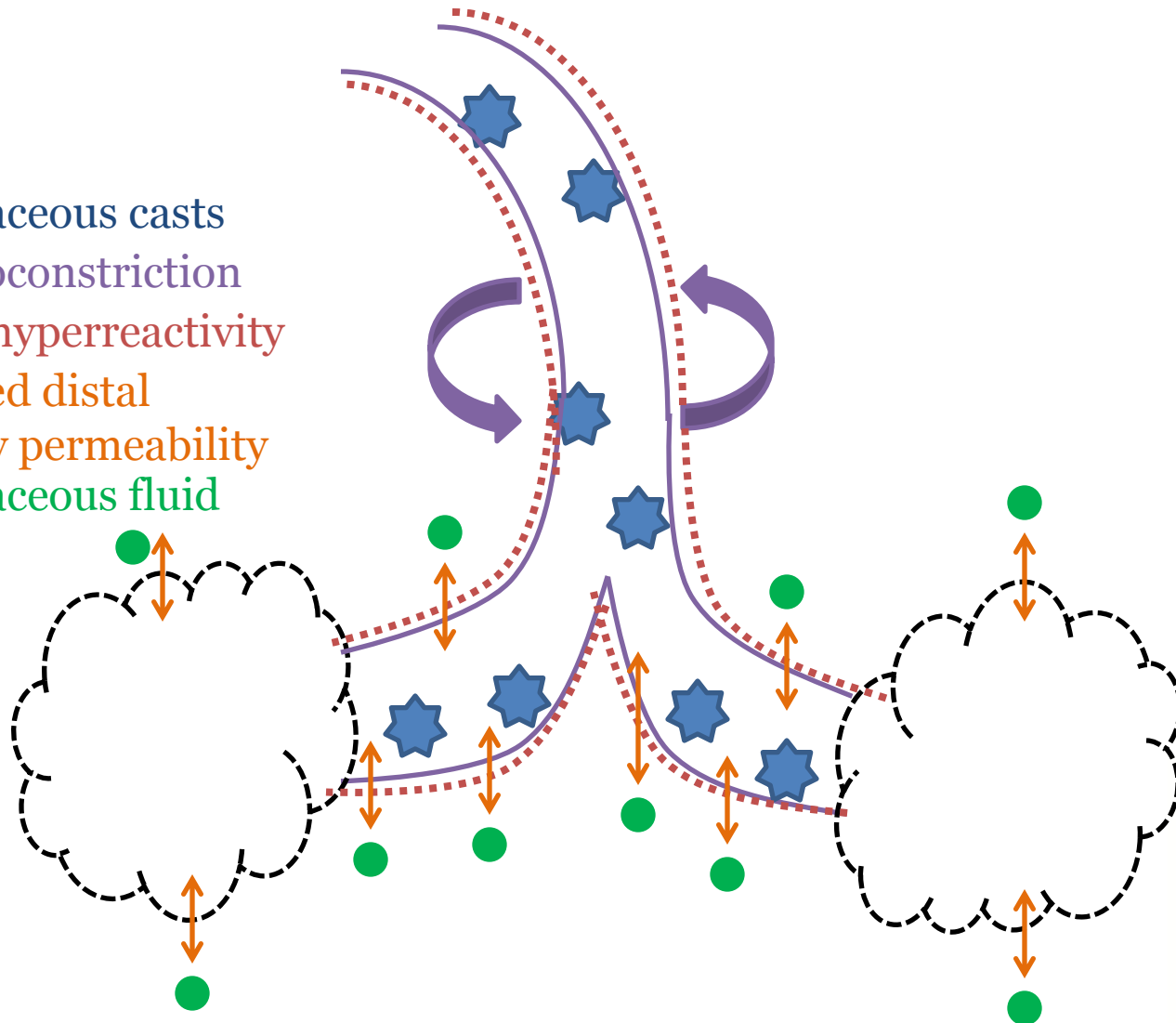
Pathophysiology

Proteinaceous casts
Bronchoconstriction
Airway hyperreactivity
Increased distal
capillary permeability



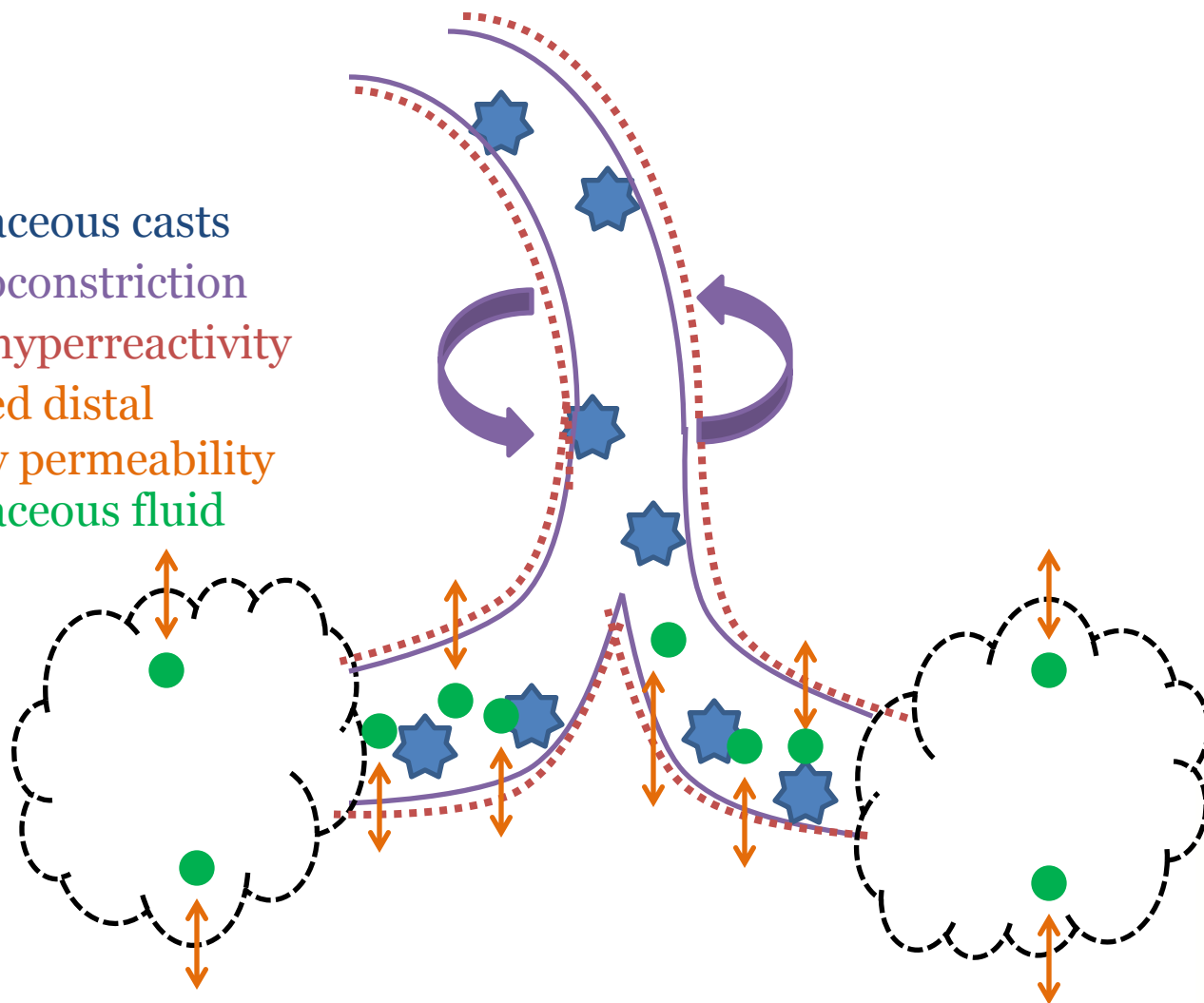
Pathophysiology

Proteinaceous casts
Bronchoconstriction
Airway hyperreactivity
Increased distal
capillary permeability
Proteinaceous fluid



Pathophysiology

Proteinaceous casts
Bronchoconstriction
Airway hyperreactivity
Increased distal
capillary permeability
Proteinaceous fluid

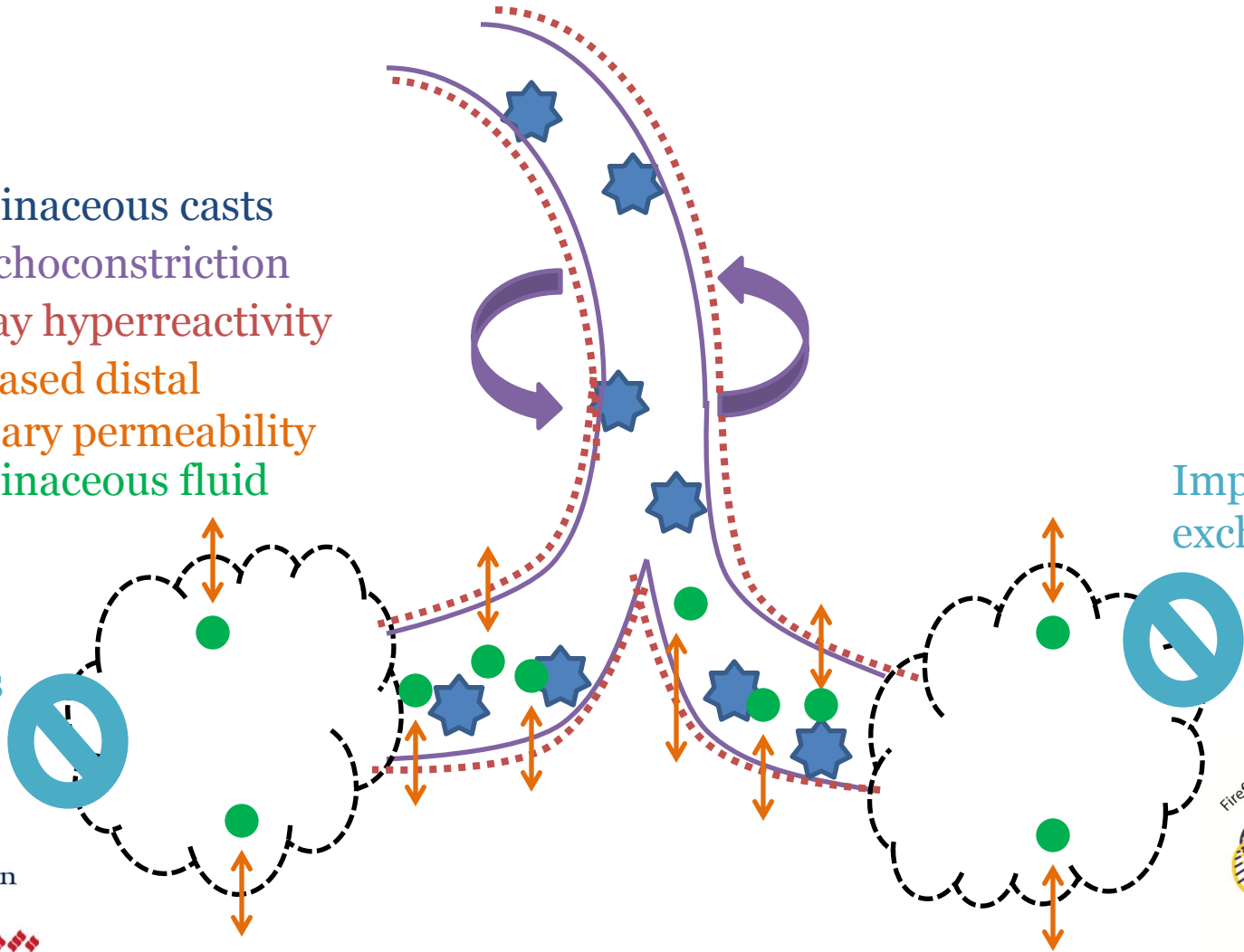


Pathophysiology

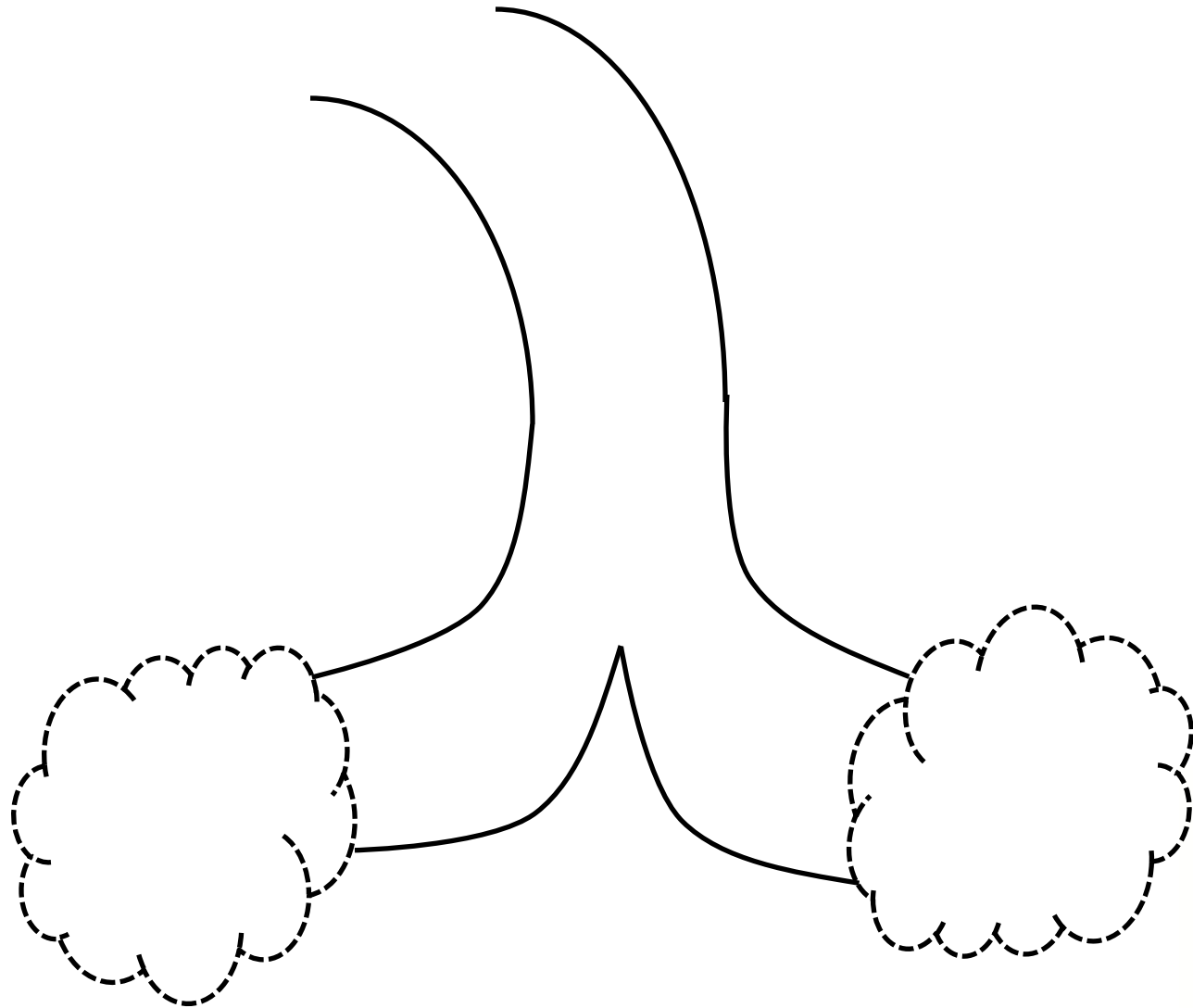
Proteinaceous casts
Bronchoconstriction
Airway hyperreactivity
Increased distal
capillary permeability
Proteinaceous fluid

Impaired gas
exchange

Impaired gas
exchange



Pathophysys of inhalation injury



The Burn Center at WHC

- 7 ICU beds
- 13 Acute care beds
- 61 yearly ICU admissions*
- 378 yearly non-ICU admissions*
- 32 yearly inhalation injuries*

*July 2011-2012


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Inhalation Injury Order Set

Time	22. Ventilator Orders: Mode: _____ Respiratory Rate: _____ FiO2: _____ Tidal Volume: _____ PEEP: _____
Date	23. If inhalation injury [<i>Consider only after discussion with the attending</i>]: <input type="checkbox"/> Sodium bicarbonate 4% 5 mL by nebulization every 6 hours x 48 hours <input type="checkbox"/> Albuterol 0.83% 3 ml by nebulization every 6 hours x 48 hours <input type="checkbox"/> Heparin 5000 units by nebulization every 6 hours x 48 hours <input type="checkbox"/> Acetylcysteine 10% 4 ml by nebulization every 6 hours x 48 hours
Time	24. Wound Care: Check all orders to be done: <input type="checkbox"/> 1% silver sulfadiazine cream burn dressing twice daily <input type="checkbox"/> Patch with 1% silver sulfadiazine cream dressings prn dressing removed or saturated <input type="checkbox"/> Other: _____
Date	25. If circumferential burn to limb, check peripheral pulses (Doppler, if necessary) q 1 hour x 24 hours
Time	26. NG tube to low continuous suction
Date	27. Diet: _____
Time	28. Urinary drainage catheter to gravity drainage
Date	29. Fluid Resuscitation: a. 4 ml x _____ % TBSA Burn x _____ weight (Kg) = _____ ml/24 hours b. Start Ringers Lactate intravenously at a rate of _____ ml/hour c. Titrate IV rate to keep urine output _____ ml/hour d. Notify Burn Attending of: <input type="checkbox"/> Urine output < _____ ml/hour <input type="checkbox"/> IV rate > _____ ml/hour <input type="checkbox"/> IV rate > 1000 ml/hour after the first 24 hours of resuscitation <input type="checkbox"/> Need to increase hourly fluid rate by > _____ ml/hr. <input type="checkbox"/> Other: _____
Time	<input type="checkbox"/> VERBAL/TELEPHONE ORDER "READ BACK" TO PRESCRIBER <input type="checkbox"/> RN SIGNATURE
Date	PRESCRIBER SIGNATURE _____ DATE / TIME _____ PRINT PRESCRIBER NAME _____ PAGER / PHONE _____

PREPRINTED PRESCRIBER'S ORDER

FORM 1168 rev12/01/10


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Inhalation Injury Order Set

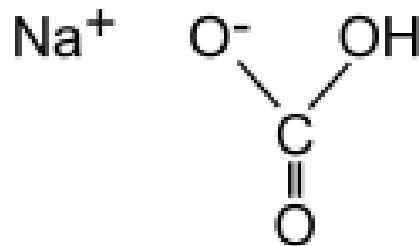
23. If inhalation injury [*Consider only after discussion with the attending*]:
- Sodium bicarbonate 4% 5 mL by nebulization every 6 hours x 48 hours
 - Albuterol 0.83% 3 ml by nebulization every 6 hours x 48 hours
 - Heparin 5000 units by nebulization every 6 hours x 48 hours
 - Acetylcysteine 10% 4 ml by nebulization every 6 hours x 48 hours


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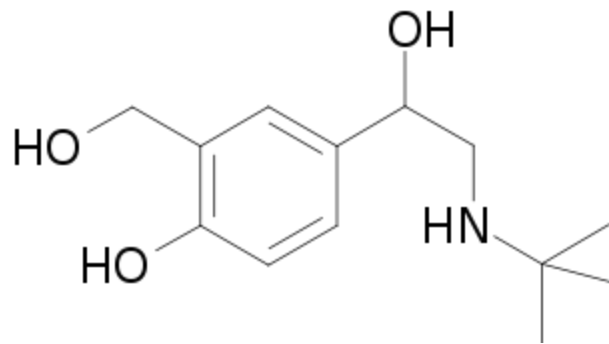


Sodium bicarbonate 4%, 5ml



Albuterol 0.83%, 3ml

- B₂-agonist
- Acts on airways and lung tissue
- Combats the bronchoconstriction component of inhalation injury

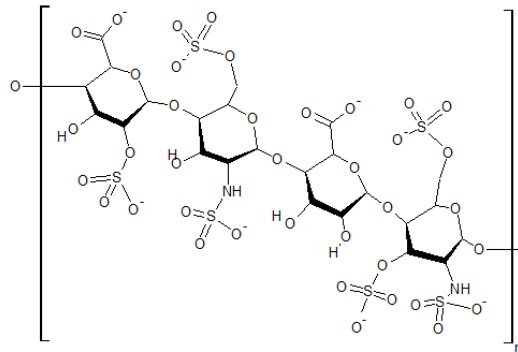



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Heparin sulfate, 5000U

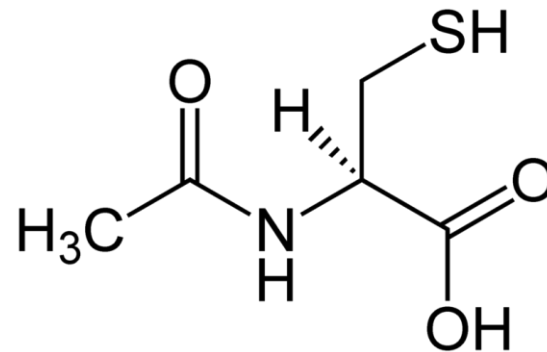


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Acetylcysteine 10%, 4ml




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Study design

Treatment Group

- 27 patients
- 2007-2009
- Average age: 44.96
- Average TBSA: 29.46%
- Average admission P:F ratio: 371.60
- Average admission COHb: 6.64(unit)

Historical Control

- 27 patients
- 2001-2003
- Average age: 47
- Average TBSA: 34.75%
- Average admission P:F ratio: 376.85
- Average admission COHb: 6.4(unit)


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results

Treatment Group

- 5 deaths
- 27.3 ICU days
- 22.9 Ventilator days
- 6.7 Days without a positive sputum culture
- 6.64 admission COHb

Historical Control

- 10 deaths
- 35.7 ICU days
- 30.5 Ventilator days
- 5.3 Days without a positive sputum culture
- 6.44 admission COHb

results

- GRAPHS

implications

weaknesses

- Historical study

Further directions

- Warrants prospective randomized study?


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References

Thanks

- Jeff Shupp, MD
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- Daniel Jo


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Thanks



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