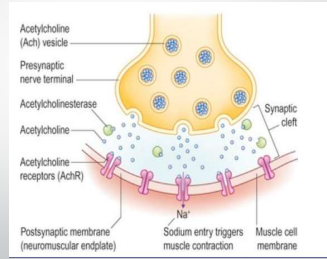


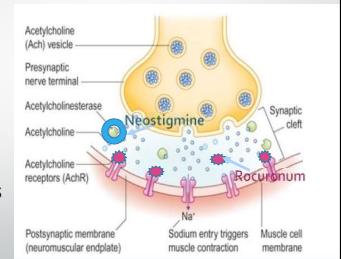
Normal Neuromuscular Function

- Normal transmission of impulses
 - Acetylcholine crosses synapse
 - Attaches to receptor
 - When released, recycled by Acetylcholinesterase



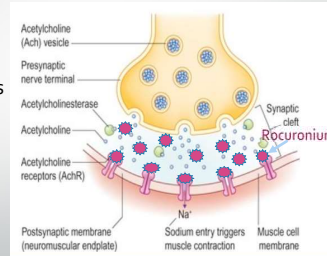
Residual paralysis

- Neostigmine wears off before NMDR
- Neostigmine timing
- Patient abnormalities
 - Renal disease
 - Acid-base imbalances
 - Calcium-magnesium abnormalities



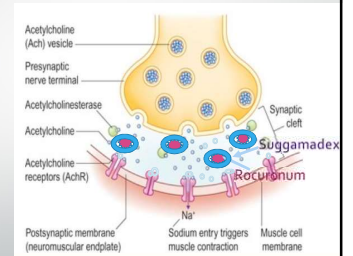
Neuromuscular blocking

- Non-depolarizing neuromuscular relaxants (NDMRs) occupy receptors preventing Acetylcholine from attaching.
- Acetylcholine is recycled without having completed its mission.



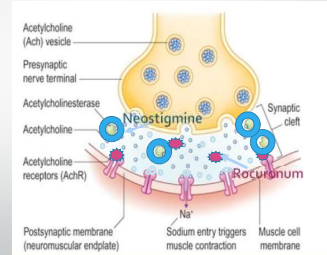
Reversal with Suggamadex

- NDMR is bound
- Acetylcholine is able to occupy receptor sites normally
- NDMR is excreted



Reversal with Neostigmine

- NDMR begins to be eliminated
- Neostigmine binds Acetylcholinesterase
- Available Acetylcholine increases
- Increasing number of receptors transmitting



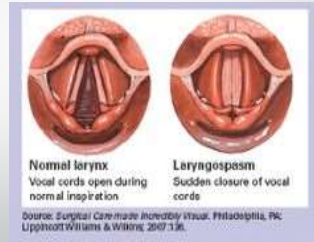
Residual Paralysis Treatment

- Airway support
 - Oxygen
 - BVM if needed
 - Intubation if needed
- Reassurance
- Avoid opioids
- Additional reversal
 - Consider Suggamadex



Laryngospasm

- Spasm of laryngeal muscle
 - Incomplete
 - Stridor
 - Complete
 - Absent breath sounds



Schick, Winkle

Laryngospasm Causes

- Causes
 - Secretions
 - Blood
 - Mucous
 - Saliva
 - Irritants
 - Allergen



Schick, Winkle

Photo from www.getyourthealth.com

Laryngospasm: Treatment

- | | |
|--|---|
| <ul style="list-style-type: none"> • Incomplete <ul style="list-style-type: none"> • Elevate HOB • Humidified O₂ • Racemic epinephrine HHN • Reassure and coach • Prepare for complete | <ul style="list-style-type: none"> • Complete <ul style="list-style-type: none"> • Call for help • Open airway • Larson Maneuver • BVM for positive pressure • Succinylcholine |
|--|---|

Schick, Winkle



Pneumothorax

- Air enters pleural space causing lung collapse
- Diagnostics: CXR



Oiseth, et al.

Image from www.ezmedlearning.com

Pneumothorax

- Treatment:
 - Supplemental oxygen
 - Elevate HOB
 - Monitor
 - Serial CXR
 - If >20%, chest tube

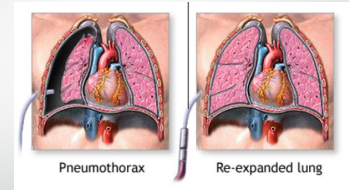


Image from www.mediclineplus.gov

Oiseth, et al.



Pneumothorax

- Causes:
 - High pressure mechanical ventilation
 - Surgical chest procedure
 - Central line placement
 - Nerve block
 - Interscalene
 - Intercostal
 - Brachial plexus

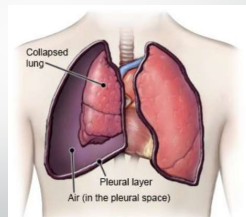


Image from www.drugs.com

Oiseth, et al.

Pneumothorax

- Symptoms:
 - Tachypnea
 - Tachycardia
 - Hypoxia
 - Hypotension
 - Dyspnea
 - Anxiety
 - Sudden sharp chest pain
 - Reduced or absent breath sounds
 - Reduced or uneven chest expansion
 - Advanced: tracheal deviation
 - Subcutaneous emphysema

Oiseth, et al.

Perianesthesia Emergencies: *It's still the ABC's*

Ronda Dyer, MSN, BSPA, RN, CPAN, CAPA, CNE

911

Non-Cardiogenic Pulmonary Edema

- AKA
 - POPE
 - Post Obstructive Pulmonary Edema
 - NPPE
 - Negative Pressure Pulmonary Edema

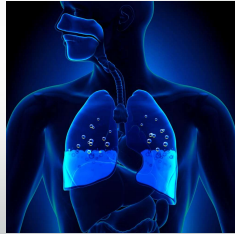


Photo Credit : decade3d - anatomy online/Shutterstock

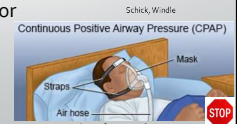
Schick, Windle

Non-Cardiogenic Pulmonary Edema

- Assessment
 - Breath sounds
 - Early wheezes
 - Progress to Crackles
 - Cough
 - Pink frothy sputum
 - CXR
- Treatment
 - Oxygen
 - CPAP or BiPAP
 - Intubate if needed
 - Albumin (osmotic)
 - Diuretics
 - Monitor



Image from radiopedia.org



Schick, Windle

Continuous Positive Airway Pressure (CPAP)

Image from www.drugs.com

Non-Cardiogenic Pulmonary Edema

- Causes:
 - Acute upper airway obstruction
 - Laryngospasm
 - Epiglottitis
 - Foreign body
 - Strangulation
 - Rapid naloxone injection
 - Relief of Chronic Obstruction
 - T&A
 - Hypertrophic Uvula
 - Tumor

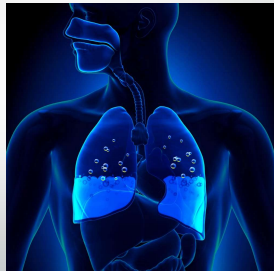


Photo Credit : decade3d - anatomy online/Shutterstock

Schick, Windle

Non-Cardiogenic Pulmonary Edema

- Etiology:
 - Respiratory effort against closed airway
 - Increased negative intrathoracic pressure
 - Fluid pulled into alveoli

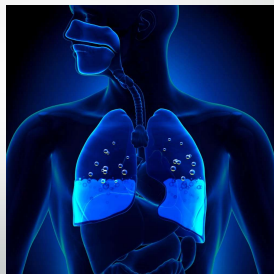
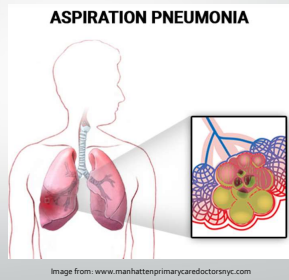


Photo Credit : decade3d - anatomy online/Shutterstock

Schick, Windle

Aspiration

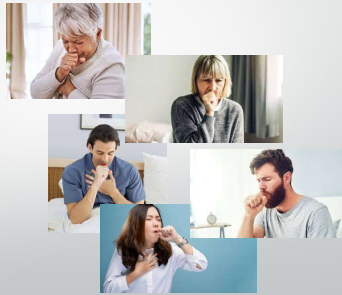
- Risk factors:
 - Emergent procedures
 - Known full stomach
 - History of GERD
 - Age over 65
 - Obese
 - Pregnant patients
 - Diabetic with gastroparesis



Shick, Windle

Aspiration

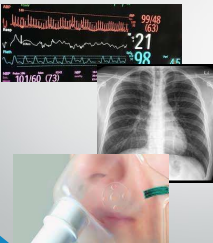
- Symptoms
 - Cough
 - Wheeze
 - Hypoxia
 - Hypercarbia
 - Tachypnea
 - Bronchospasm
 - Tachycardia



Finkie, et al

Aspiration

- Treatment
 - Ensure airway patency
 - Oxygen
 - CXR (likely inconclusive)
 - Bronchoscopy if foreign body (ie: teeth)
 - Monitor
 - Prophylactic antibiotics or steroids not recommended



Finkie, et al



Obstructive Sleep Apnea

- 20% of US adults²
- 90% undiagnosed²
- Associated Morbidity
 - Hypertension
 - CVA
 - Pulmonary vascular disease
 - Heart disease
 - CHF
 - Fatigue
 - Increased MVA

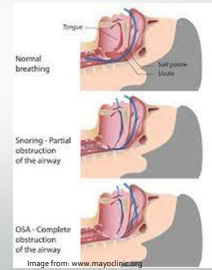


Source: <http://classicalartwork.com/old-man-snoring-accident-17101010>

Finkle, et al.

Treatment Modification

- Reduce sedation
 - Consider spinal or regional
 - Multimodal analgesia
- Position
 - Elevate HOB
- Observation (prolonged)
 - Pulse oximetry
 - ETCO₂
- Oxygen
- CPAP or BiPAP



Finkle, et al.

Obstructive Sleep Apnea

- PeriAnesthesia Risks
 - Hypoxia
 - Acute respiratory failure
 - Cardiac events
 - Unplanned admission



Finkle, et al.

Image from: www.EMS1.com

Education

- Encourage follow up if undiagnosed
- Instruct to avoid sedating medications at home
- Avoid alcohol
- Recommend recliner or elevated HOB
- If patient has CPAP, instruct to use when home from surgery



Image from: www.ehdc.org

Finkle, et al.

Forewarned is Forearmed

- Preop Screening
- STOP/BANG questionnaire

STOP			
S	So you snore loudly (louder than talking)?	Yes	No
T	Do you often feel tired, fatigued or sleepy during the daytime?	Yes	No
O	Has anyone observed you stop breathing or choking or gasping during your sleep?	Yes	No
P	Do you have or are you being treated for high blood pressure?	Yes	No

Bang			
B	BMI more than 35?	Yes	No
a	Age - over 50 years old?	Yes	No
n	Neck circumference - is it greater than 17" if you are a male or 16" if you are a female?	Yes	No
g	Gender - are you a male?	Yes	No

Score your yes tally:

- 0 - 2 Low risk
- 3 - 4 Intermediate risk
- 5 - 8 High risk

Finkle, et al.

References

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2. Finkel, Kevin J., et al. "Prevalence of undiagnosed obstructive sleep apnea among adult surgical patients in an academic medical center." *Sleep medicine* 10.7 (2009): 753-758.
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4. Oiseth, S., Jones, L., Maza, E. (2021). *Pneumothorax*. www.lecturio.com.
5. Schick, L., & Windle, P. E. (2021). *Perianesthesia nursing core curriculum: preprocedure, phase I and phase II, PACU nursing*. St. Louis, MO: Elsevier.
6. Vijayan, Vannan Kandi. "Morbidity associated with obstructive sleep apnea." *Expert review of respiratory medicine* 6.5 (2012): 557-566.