On this episode: Dr. Jed Wolpaw

In this episode, episode 90, I discuss best practices for preoperative management of adults with Obstructive Sleep Apnea (OSA).

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Prevalence
- Prevalence 10% to 18% in adults
- Prevalence 70% in bariatric surgery

Apnea Hypopnea Index
- Apnea hypopnea index (AHI) is used for diagnosis of OSA and grading of severity → number of apnea and hypopnea episodes per hour
  - < 5 is normal
  - 5 to 14 is mild
  - 15 to 29 is moderate
  - ≥ 30 is severe
- Hypopnea = respiratory flow drop of ≥ 30% or saturation drop ≥ 4% compared to baseline for at least 10 seconds
- Apnea = respiratory flow drop of ≥ 90% compared to baseline for at least 10 seconds

STOP-Bang Score
- STOP-Bang score for screening most widely used and validated → yes = 1 point
  - S = snore loudly
  - T = tired
  - O = observed → observed stopping breathing or chocking/gasping during sleep
  - P = pressure → high blood pressure
  - B = BMI > 35
  - A = age > 50
  - N = neck circumference > 43cm in men and 41cm in women
  - G = male gender
- Chung and colleagues first published score in 2016, used cut off of 3 for mild OSA
  - Sensitivity 83.6%; specificity 56.4%
- Most places use cut-off of 4 to balance sensitivity and specificity
- No modifications are well validated

Comorbidities
- Obesity
- Hypertension
- History of stroke
- History of myocardial infarction
- Diabetes
- Downs syndrome
- Neuromuscular diseases
- Associated with difficult airway management

Screening
- Ideal is polysomnography (sleep study; gold standard for screening) at clinic
- History:
  - Look at past records
  - Ask STOP-Bang score
Ask about morning headaches which are associated with OSA

- Physical exam:
  - Craniofacial abnormalities
  - Airway
  - Anatomical nasal obstruction
  - Neck circumference
  - Tonsil size
  - Tongue size

Pediatric Associated Risk Factors
- Intermittent vocalization at night
- Restless sleep
- Night terror
- Sleeping in unusual positions
- New onset enuresis
- Daytime somnolence
- Falling asleep when not stimulated eg. sitting in car
- Easily distracted
- Overly aggressive
- Irritable
- Difficult concentrating
- Difficult to arouse

Management
- In-patient vs. out-patient surgery → discuss with surgeon; depends on:
  - Severity of OSA
  - Intensity of surgery
  - How much post-op opioid required
- Avoid opioids with multimodal analgesia (eg. regional blocks, IV lidocaine, IV ketamine, IV magnesium, Tylenol, NSAIDs, pre-operative gabapentin)
  - If have to use opioids, try to use short-acting opioids (eg. remifentanil)
- Careful with heavy sedation → secure airway if using deep sedation
- Use mandibular advancement device or CPAP if they use it at home and not intubated
- If using neuromuscular blockade, ensure fully reversed
- Extubate awake
- When waking, have patient in lateral or semi-upright position
- Higher risk for being at difficult airway with mask ventilation and intubation → have back-up plan (eg. Glidescope or C-MAC in room)
- Higher risk for coronary events → careful monitoring of blood pressure
- Consider doing surgery in semi-upright position or on RAMP
  - RAMP prevents pharyngeal closure, increases total lung volume, better visualization during intubation

Post-operative Management
- Consider keeping patient on monitoring for longer post-operatively because higher risk for post-operative respiratory complications
Higher risk post-operative respiratory depression
- Opioids, sedatives, invasiveness of procedure increases potential of apnea on post-op day 3 and 4 → higher risk of obstruction during REM sleep
  - REM rebound on post-op day 3 and 4
- Post-operative use of home CPAP → CPAP splints open airway, decreases inflammation and edema in airway
  - Shown to have ↓perioperative cardiac morbidity and ↓admission to ICU
- Have patient sleep prone, lateral, or sitting
- Stay on O₂ in monitored setting until patient able to maintain baseline saturation on room air

Summary
- OSA has high prevalence
- Lots of comorbidities and associated risks
- Screen patients with STOP-Bang
- Intra-operatively do multimodal analgesia to avoid opioids
- Secure airway in patients with deep sedation
- Limit opioids post-operatively
- Consider prolonged monitoring

References
