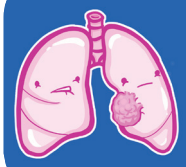

NOTES
SLEEP-RELATED RESPIRATORY DISEASE

GENERALLY, WHAT IS IT?

PATHOLOGY & CAUSES

- Impaired capacity to breathe

SIGNS & SYMPTOMS

- Apneic episodes (variable duration); fatigue; hypoxemia; hypercapnia

DIAGNOSIS

OTHER DIAGNOSTICS

Polysomnography

- Measure sleep patterns, rapid eye movements (REM), tonicity of neck muscles, snoring, airflow, end tidal CO_2, oxygen saturation, cardiac rhythm, body positioning
  - *Electroencephalography:* sleep pattern
  - *Electrooculography:* REM
  - *Electromyography:* neck muscle tonicity
  - *Electrocardiography:* heart rhythm
  - *Video monitoring:* body positioning

TREATMENT

OTHER INTERVENTIONS

- Supportive, lifestyle modification

APNEA OF PREMATURITY

osms.it/apnea-of-prematurity

PATHOLOGY & CAUSES

- Most common cause of apnea in preterm neonates
- Developmental disorder associated with decreased responsiveness to carbon dioxide
- Respiratory pauses of ≥ 20 seconds/shorter pause with bradycardia (< 100/minute), cyanosis, pallor, oxygen desaturation in neonates < 37 weeks gestational age (GA)

CAUSES

- Immaturity of fetal brain areas responsible for breathing
- Incidence increases with degree of prematurity
  - Most neonates < 28 weeks GA
  - > ½ neonates 28–36 weeks GA

SIGNS & SYMPTOMS

- Apneic episodes ≥ 20 seconds in first 72 hours post-birth
  - Frequency increases 14–21 days post-birth

- Bradycardia
- Hypoxemia

DIAGNOSIS

OTHER DIAGNOSTICS

- Monitor premature neonates
  - Cardiorespiratory monitors, pulse oximetry
- Exclude other causes for apnea
  - Metabolic disorders, neurological disorders, infections, antepartum drugs (e.g. opiates)

TREATMENT

- Resolves spontaneously after 37 weeks postmenstrual age
  - Postmenstrual age = postnatal age + GA age

MEDICATIONS

- Methylxanthines
  - Improve sensitivity to carbon dioxide, increase ventilations/minute, decrease periodic breathing events

OTHER INTERVENTIONS

- Nasal CPAP

SLEEP APNEA

osms.it/sleep-apnea

PATHOLOGY & CAUSES

- Irregular breathing patterns, shallow breathing and snoring during sleep.
- *Apnea:* momentary: pause in breathing
- Can last several seconds to several minutes
- More than five episodes an hour must occur
- *Hypopnea:* abnormally shallow breathing event

TYPES

Central sleep apnea

- Sudden failure of brain respiratory center's generation of spontaneous breathing efforts
- Damage to brain respiratory centers→ ↑ respiratory drive → hyperventilation → CO_2 (hypocapnia) → apnea → ↑ ↑ CO_2(hypercapnia) → ↑ respiratory drive → hyperventilation
- Associated with Cheyne–Stokes respiration

Obstructive sleep apnea

- Intermittent airway obstruction → 20–30 second apnea → individual wakes from sleep
- Most common form of sleep apnea; peripheral problem; obstruction at oropharynx

CAUSES

Obstructive sleep apnea

- Obesity (most common)
- Hypertrophic adenoid glands/palatine tonsils
- Micrognathia (small chin, AKA underbite)
- Sedatives (excessive muscle relaxation—alcohol, sleeping pills)
- Allergies
- Hypothyroidism (obesity, less muscle tone)

RISK FACTORS

- More common in individuals who are biologically male
- Incidence increases with age

COMPLICATIONS

Obstructive sleep apnea

- Systemic hypertension
- Diabetes
- Anginal chest pain, arrhythmias, heart failure
- Pulmonary hypertension, cor pulmonale, respiratory failure

SIGNS & SYMPTOMS

- Sleep deprivation, excessive daytime fatigue
- Headache, difficulty concentrating
- Morning headaches

Central sleep apnea

- Nocturia
- Stress-induced insomnia
- Nocturnal anginal chest pain

Obstructive sleep apnea

- Loud snoring
- Hypopnea
- Repeated arousals from sleep
- Decreased libido

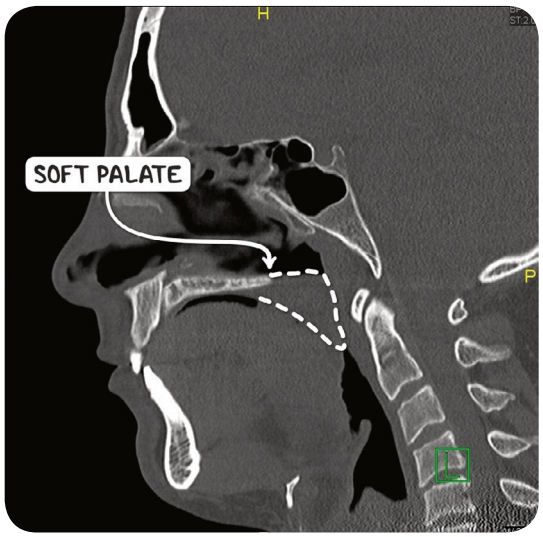

Figure 132.1 A CT scan of the head and neck in the sagittal plane. The soft palate is elongated, thickened and abutts the posterior pharynx, leading to obstructive sleep apnea.

DIAGNOSIS

OTHER DIAGNOSTICS

- Polysomnography

TREATMENT

MEDICATIONS

- *Central sleep apnea:* respiratory stimulants (acetazolamide, theophylline)

SURGERY

- *Obstructive sleep apnea:* micrognathia, hypertrophic adenoids/tonsils

OTHER INTERVENTIONS

- Continuous positive airway pressure (CPAP)
- *Central sleep apnea:* supplemental oxygen during sleep
- *Obstructive sleep apnea:* custom mouthpieces, weight loss