Identification of Sleep Disordered Breathing Using Polysomnography

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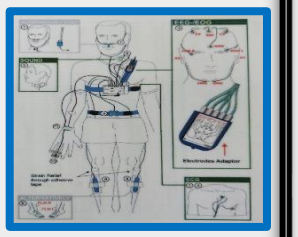
Polysomnography (PSG) is a multi channel recording of multiple parameters of an individuals sleep used as a diagnostic tool in sleep medicine

Parameters recorded include:

- EEG (AASM standard)
- SpO2
- Snoring
- Respiratory Effort (Chest & abdomen)
- Airflow (Thermistor & Canuala)
- ECG
- Body movement and position



Source: Somnoscreen User Manual - Somnomedics

Common Examples of Sleep disordered breathing –

- Obstructive sleep Apnoea (OSA) – severity based on no. of apnoea/hypopnoa events/hour of sleep (AHI)
  - 5-15 – Mild
  - 15-30 – Moderate
  - ≥30 - Severe
- Central sleep apnoea (CSA)
- Cheyne-Stokes Respiration
- Concurrent COPD and OSA
- Hypoventilation related to obesity or neuromuscular disease

Signs and symptoms

- Excessive Daytime Sleepiness (EDS)
- Witnessed apnoeas (usually by bed partner)
- Snoring
- Frequent nocturia
- Waking gasping for breath
- Morning headache
- Poor daytime concentration

Risk Factors

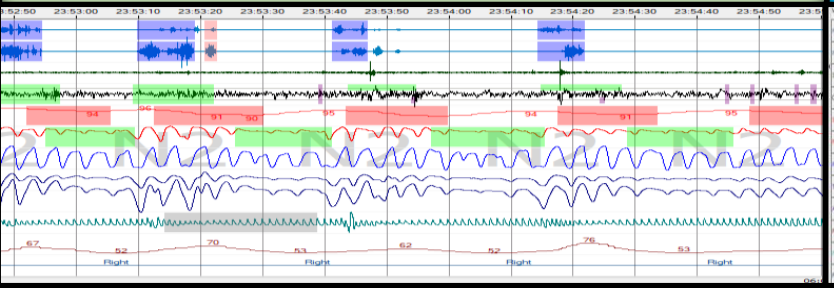
- Increased BMI
- Male
- Large neck circumference
- >40years
- Receding Jaw
- Large tonsils
- Family History
- Hormone conditions
- Use of sedatives

Types of abnormal respiratory events

- Hypopnoea
- Obstructive apnoea
- Central apnoea
- Mixed apnoea
- Respiratory effort related arousal (RERA)
- Cheyne-Stokes Respiration

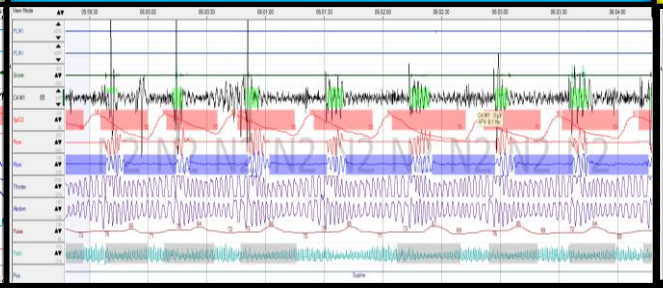
Hypopnoea

- reduction in airflow by ≥30% of pre event baseline
- Event lasts for ≥10 seconds
- Event associated with either a 3% desaturation or an arousal from sleep



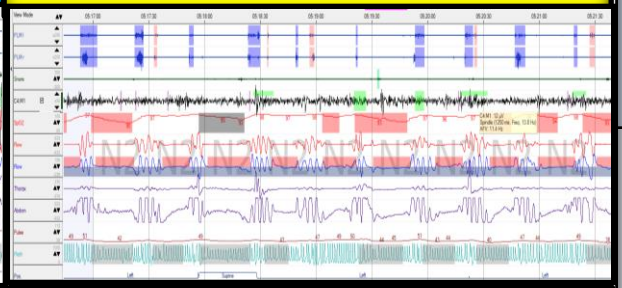
Obstructive apnoea

- Reduction in airflow by ≥90% of pre event baseline
- Event lasts for ≥10 seconds
- Continued respiratory effort throughout the event



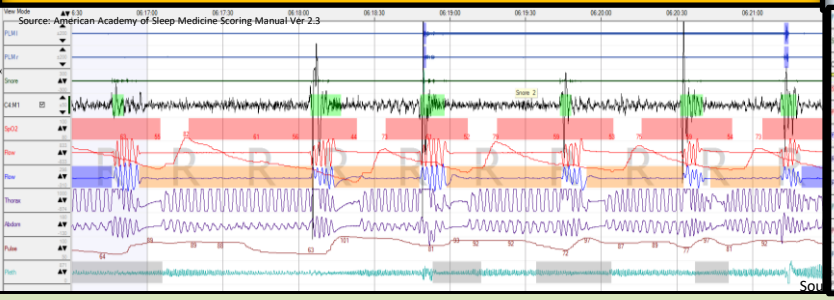
Central apnoea

- Reduction in airflow by ≥90% of pre event baseline
- Event lasts for ≥10 seconds
- **Absence** of continued respiratory effort throughout the event



Mixed apnoea

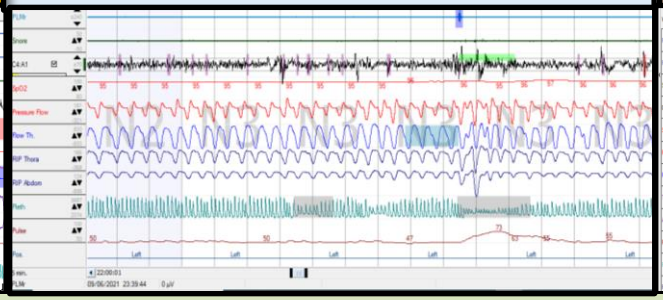
- Reduction in airflow by ≥90% of pre event baseline
- Event lasts for ≥10 seconds
- Absence of respiratory effort in the initial portion of the event with resumption of respiratory effort in the secondary portion of the event



Source: American Academy of Sleep Medicine Scoring Manual Ver 2.3

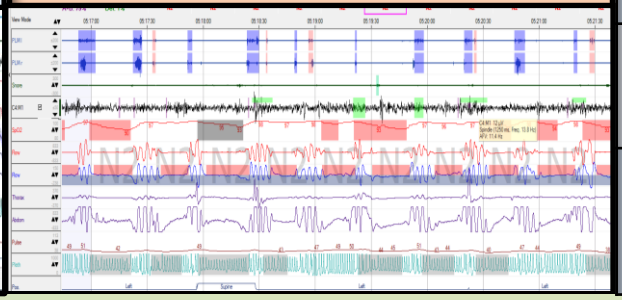
RERA

- Sequence of breaths lasting ≥10 seconds characterised by increasing respiratory effort or flattening of the inspiratory portion of waveform
- Associated with an arousal from sleep
- Sequence of breaths does not meet criteria for apnoea or hypopnoea



Cheyne-Stokes Respiration

- ≥3 consecutive central apnoeas separated by crescendo/decrescendo change in breathing amplitude
- ≥5 central apnoeas or hypopnoeas per hour of sleep associated with the crescendo/decrescendo change in breathing pattern over ≥2 hours of monitoring



Condition	Treatment Option
Mild OSA	Weight loss, mandibular advancement devices, positional training, positive airway pressure (CPAP)
Moderate /Severe OSA	CPAP, positional training, weight loss
CSA / Cheyne Stokes respiration	Address other medical disorders/medications contributing to CSA. CPAP in first instance, if unsuccessful BiPAP (Bilevel positive airway pressure) or ASV (adaptive servo ventilation). Supplemental O2 may be considered
OSA w/COPD	CPAP/BiPAP ± supplemental O2 if required
Obesity hypoventilation	Weight loss CPAP (if OSA) BiPAP(if not OSA)
Hypoventilation in neuromuscular disease	BiPAP