



RESPIRATORY CARE

Tests, Concepts, and Procedures

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Include:

- Electrocardiogram (EKG or ECG)
- Pulmonary Function Test (PFT)
- Oxygen Saturation
- Arterial Blood Gases (ABG)
- Oxygen Therapy
- Incentive Spirometry
- Medicated Aerosol Therapy
- Hyperinflation Therapy

Electrocardiogram

- In some facilities the respiratory staff is responsible for performing EKG's.
- What does EKG stand for?
- What is an EKG?



Pulmonary Function Test

- Detect the presence or absence of lung disease
- Measure the effect of a known disease on lung function
- Measure the effects of occupational & environmental exposure
- Determine the effects of therapy
- Assess the risk for surgery
- Evaluate disability or impairment
- (2:46)

<https://www.youtube.com/watch?v=hs8VPlyIr7Y>



Oxygen Saturation

- Measures the level of oxygen-carrying capabilities in the blood
- Measured with a pulse oximeter
- Pulse ox measures how saturated the RBCs are with O₂
- Normal adult SpO₂ should be >95%
- If SpO₂ is <95%, pt may need additional O₂



Arterial Blood Gases

- AKA ABG
- Blood test from arterial blood sample
- Assess levels of O₂, CO₂, and other elements in the bloodstream
- What type of vessel must be used to draw an arterial blood gas?



Oxygen Therapy

- Room air is 21% O₂
- Supplemental O₂ is considered a drug & has to be ordered by MD
- Reasons pts need O₂:
 - 1) Hypoxemia=low levels of O₂ in the blood
 - 2) Work demands of breathing=pts who are SOB consume more O₂ by working the respiratory muscles hard & can be evidenced by: increased RR, use of accessory muscles, cyanosis
 - 3) Work of the heart=relieve the work of the heart so it is not further stressed trying to pump harder and faster to get more O₂ to tissues

Oxygen Therapy

- 2 devices used to deliver O₂=nasal cannula & simple mask

Nasal cannula:

- Provides low-flow O₂ of 1-6 liters per minute
- Lightweight & easy to use
- Pts can eat & speak comfortably when it is in use
- Can be used for long-term therapy (COPD)



Oxygen Therapy

Simple mask:

- Fits over pt's nose & mouth
- Delivers 35-50% O₂
- Used for emergencies & short-term therapies



Oxygen Therapy

Respiratory therapists are responsible for determining whether O₂ therapy is working by watching for the following improvements:

1. Pt should think more clearly, become less restless & agitated because more O₂ is reaching the brain
2. SOB will decrease as evidenced by: pt will breathe easier; color of skin, nail beds, and mucous membranes will improve
3. VS will come closer to normal as HR & RR decrease
4. ABG O₂ will rise to more normal level

Oxygen Therapy

Hazards of O₂ therapy:

1) **O₂ toxicity**=Too much O₂ delivered for too long a period of time

Can happen if normal person breathes 100% O₂ for longer than 12-24 hours

Symptoms=sore throat, dyspnea, cough, chest discomfort

Lung tissue can be damaged by excessive amounts of O₂

2) **Retinopathy of prematurity (ROP)**=Caused by high O₂ levels in infants

May lead to blindness

3) **Atelectasis**=Lung collapse

Occurs when high concentrations of O₂ reduce the amount of nitrogen in the lungs

Hyperinflation Therapy

- AKA lung expansion therapy
- Treatments designed to prevent or treat partial or full lung atelectasis (lung collapse)
- Atelectasis usually results of a blockage of the airway
- Caused by tumors, large amount of mucus in airways, pt consistently breathing in small amounts of air & not fully expanding their lungs

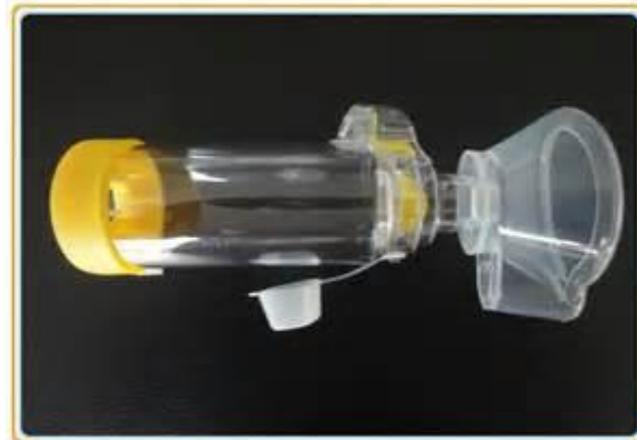
Incentive Spirometry

- Most common hyperinflation therapy
- Prevents or treats atelectasis
- Pts prone to atelectasis:
 - Have had upper abd surgery
 - Have had thoracic surgery
 - Have COPD & are undergoing surgery
 - Have been bedridden for extended period of time
 - Are heavy smokers & are undergoing surgery



Medicated Aerosol Therapy

- Can deliver medication directly into the lungs in the form of an aerosol or mist that can be inhaled directly into the lungs



Medicated Aerosol Therapy

Advantages:

- Meds are delivered directly & quickly to the site where it is needed
- Smaller doses can be used since it is inhaled directly into lungs
- Meds act quickly due to rich blood supply of lungs
- Few side effects
- Convenient, easy, painless
- Can be used at home

Disadvantages:

- Difficult to administer the correct dose each time because many factors influence how much of the med reaches the airway
- Difficult to teach pts how to use it correctly
- HCW may not know how to properly use or instruct the pt on proper technique

Medicated Aerosol Therapy

Drugs that can be delivered by aerosolized medications:

- **Nasal Decongestants**=vasoconstrict vessels of the nose to decrease blood flow and allow nasal passages to open up & air to flow easier
- **Brochodilators**=increase the diameter of the lung airways to make breathing easier; used for asthma attacks to open airways up
- **Antiasthmatics**=reduce allergic response, prevent asthma attacks or decrease the number of attacks for pt's that have allergic asthma
- **Corticosteroids**=used for anti-inflammatory maintenance therapy for moderate to severe persistent asthma when airways are swollen
- **Mucolytics**=break down secretions so they can be expectorated (coughed) out
- **Antimicrobials**=aerosolized antibiotics

Medicated Aerosol Therapy

- Pts must be taught proper technique for using aerosol device to maximize the amount of medication that gets into the lungs
- Metered dose inhaler (MDI) is most frequently used aerosol device
- MDI=small, portable pressurized device that delivers med to lungs
- When inverted it administers med in form of an aerosol through the mouthpiece
- Spacer, holding chamber, or extension device can be used with MDI to make it easier to use & more effective

