Objectives

- Identify two conditions that may require the use of oxygen.
- Identify two risks of using oxygen in the home or facility and how to prevent these risks.
- Identify the difference between a Self Filling Oxygen system, Concentrator, LOX oxygen, and Gaseous Tanks.
Oxygen Therapy

- When the body’s cells don’t get enough oxygen, a condition called hypoxia (lack of oxygen at the tissue level) results.
- This condition causes shortness of breath, rapid breathing, and an increased irregular heart rate.
- Treating hypoxia may require the use of supplemental oxygen to return tissue and blood oxygen to normal.

Oxygen Therapy

- Oxygen is a colorless, odorless, and tasteless gas that makes up approximately 21% of the earth’s air (the balance being nitrogen and a few trace elements).
- When used medically, oxygen is a prescription drug and requires a physician’s order for use.
- When the body’s cells don’t get enough oxygen, a condition called hypoxia (lack of oxygen at the tissue level) results.
- This condition causes shortness of breath, rapid breathing, and an increased irregular heart rate.
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Conditions that often require Oxygen

- Lung Diseases (COPD, Emphysema)
- Cancer
- Heart Attack
- CHF
- Pulmonary Fibrosis
- Asthmatics
How does Oxygen help?

- Improves sleep
- Improves mood and energy level
- Decreases the work of breathing
- Improves ability to do ADLs
- Increases and improves mental alertness

Signs and Symptoms of Low Oxygen (Hypoxemia)

- Labored and fast respirations
- Fast pulse (tachycardia)
- Fatigue
- Blurred vision
- Restlessness
- Anxiety
- Change in skin color (pale/blue) nail beds
- Sleepiness

Management of Patients on Oxygen

- Check skin behind ears
- Energy conservation
- Pursed lipped breathing
- Relax … sit down when doing cares
- You must be aware and observant of your patients breathing
- Schedule personal cares in early part of the day
Risks of Oxygen

- Oxygen does not burn or explode (it increases risk of fire)
- Oxygen supports fire (causing it to burn very hot and quick)
- Oxygen tanks and liquid oxygen vessels contain oxygen under pressure (which can explode)

Oxygen is a Necessity for Life

- Plans should be made in case of power failure
- Facilities must have generators
- Facilities should always have extra supply of oxygen tanks

Oxygen Requirements

- Must have a doctors prescription
- Adjustment to liter flow must come from a medical professional
- Keep the oxygen tubing in sight
  - Do not put under furniture, bed covers, carpets or other items
Oxygen Safety

- Make sure there are working fire extinguishers in your facilities
- There should always be working smoke detectors
- No Smoking signs must be visible

Respect Oxygen

- Prevent tanks or vessels from falling
- If falls over - could break, causing the pressurized oxygen to escape rapidly
- This pressure can cause the tank or vessel to fly through the air

Preventing Fires in your Facility

- **DO NOT** allow smoking in your facility
- Have a designated location for smoking (if you must)
- Be firm with family and or friends visiting
- **DO NOT** leave Oxygen on when not in use
- Always monitor residents who are smokers - know your smokers
- When oxygen is on, keep it and the patient at least 5 feet away from fireplaces, stoves, or gas appliances (dryer, hot water heater)
- Static electricity
Preventing Fires in your Facility (continued)

- Avoid flammable products
  - Paint thinner
  - Rubbing alcohol
  - Oil-based products (Vaseline)
  - Always use water-based lubricant (K-Y jelly to moisten lips or nose)
  - Know your guidelines for people who smoke and enforce them

Most Commonly Used Oxygen Systems

- Oxygen (gaseous) tanks
- Concentrator
- Self Filling Oxygen Systems
- Liquid Oxygen (LOX) almost extinct

[Image of a person using oxygen equipment]
Oxygen Cylinders (Tanks)

- Oxygen cylinders or tanks store oxygen under great pressure (usually 2000-2200 PSI).
- Oxygen cylinders come in a large range of sizes to meet the varied needs of the patient.
- The pressure in the cylinder is indicated by the pressure gauge on the oxygen regulator attached to the cylinder.
- 100% purity

Oxygen Cylinders (Tanks)

- A dial on the regulator allows for the adjustment of the oxygen flow rate measured in liters per minute (LPM).
- Patients can change the regulator easily from empty to full tanks allowing the freedom to pursue activities outside the home.
- With the tank valve closed completely, no oxygen is lost between uses.

Care of Oxygen Tanks

- Keep oxygen tanks upright in a cart, rack, or stable base
- Never tip tanks on their side
- Do not use tanks or vessels that have fallen or are damaged
- Store out of direct sunlight and in a well aired space
Oxygen Tank (Cylinder) Storage

- If a facility know your specific storage requirements
- Ask you oxygen supplier to provide ongoing in-services on safety and storage
- Oxygen should not be stored with other flammable gases or liquids

Various Oxygen Systems

- Perfecta 2 (5 Liter)
- Platinum™ (10 Liter)
- HomeFill® System
- XPO2™ POC
- Solo2™ TPOC

Oxygen Concentrators

- An oxygen concentrator is an electrically powered machine that filters and separates the room air into oxygen and nitrogen.
- The oxygen is stored, concentrated, pressurized and delivered to the patient at 90-95% purity.
Oxygen Concentrators

- Oxygen concentrators are a very efficient and economical way to provide oxygen in the home.
- They require very little maintenance, and as a result, they are the primary home oxygen delivery system.
- Patients on oxygen concentrators require a back-up system (usually an oxygen tank) in case of malfunction or power failure.

Concentrator Safety

- Concentrators are electrical devices that should only be plugged into a properly grounded or polarized outlet.
- **DO NOT** use extension cords.
- **DO NOT** use multi-outlet adaptors such as power strips.
- Avoid using power sources that create heat or sparks.
- Use a power supply or electrical circuit that meets or exceeds the amperage requirements of the concentrator.

What's WRONG with this Picture?

- Ensure concentrator is plugged into a properly grounded or polarized outlet.
- Avoid using extension cords or multi-outlet adaptors.
- Avoid using power sources that create heat or sparks.
- Use a power supply or electrical circuit that meets or exceeds the amperage requirements of the concentrator.
What's RIGHT with this Picture?

Self Filling Oxygen System – Home Fill

Home Fill Tanks Fill Times
Freedom and Independence

- Continuous supply of portable oxygen
- No more waiting for oxygen deliveries
- Ease of use for staff to managed
- Patients are more compliant with oxygen usage
- Fosters independence for ambulatory oxygen

User Overview

Dexterity Poor Vision Load Carrying Learning Storage

Liquid Oxygen Systems (LOX)

- Liquid Oxygen Systems consist of a stationary unit (reservoir) which stores a large volume of liquid oxygen and a portable unit that can be refilled from the reservoir.
- To remain in a liquid form, oxygen must be stored at approximately minus 297 degrees F. For this reason the reservoir and the portable unit are actually cryogenic vessels that look and operate like large thermos containers.
### Liquid Oxygen Systems (LOX)

- When the oxygen is turned "on," the liquid warms as it leaves the container, changes to gas, and is supplied at room temperature.
- Some liquid portables also act as conserving devices allowing a patient's greater duration of use at a greatly reduced size and weight.
- Oxygen set-ups and fills are done by skilled drivers/technicians and followed-up by the respiratory therapy department.
- Rarely used – almost extinct
- NEVER TOUCH LIQUID TO AVOID FROST BITE
- If in a facility, never fill LOX in a patient’s room – State Regulation

### Traveling with Oxygen – Rules

- NO SMOKING in the car
- NEVER put oxygen in a hot vehicle
- NEVER put oxygen in the trunk
- Oxygen must always be secured to avoid rolling or banging (seatbelt)
- Air movement in the vehicle
- Upon arrival … remove the oxygen
Traveling Oxygen Systems

- Invacare S0LO2™
  - pulse dose flow (up to 3 l/min)
  - humidifier flow (up to 3 l/min)
  - Battery/AC power source
  - weight 14 lb
  - rolling cart included
  - FAA approved

- Respironics SimplyGo™
  - pulse dose flow (up to 3 l/min)
  - humidifier flow (up to 3 l/min)
  - Battery/AC power source
  - weight 14 lb
  - rolling cart included
  - FAA approved

- SeQual Eclipse™
  - pulse dose flow (up to 3 l/min)
  - humidifier flow (up to 3 l/min)
  - Battery/AC power source
  - weight 14 lb
  - rolling cart included
  - FAA approved

Common Troubleshooting Techniques

- The cannula and a glass of water (watch for bubbling)
- Check oxygen contents on the gauge
- Check flow setting on oxygen source
- Check on/off switch
- Check tubing’s for kinks, connections
- Check washable filter on concentrator for clogging
- Check circuit breaker on back of concentrator

Changing Nasal Cannula Tubing

- It is recommended that you change your cannula every two weeks to avoid possible contamination.
- Tubing from the cannula to the oxygen source should be replaced monthly. If no humidifier is used, the tubing should be changed every three months.
Oxygen Cannulas and Masks

- Nasal cannula – 24-40% O2 at 1-6 LPM
- Simple mask – 35-50% O2 at 5-10 LPM
- Mask with reservoir bags – greater than 60% O2 (must keep reservoir bag inflated)

Oxygen Percentages

- Always make sure you’re following universal precautions – Wash your hands
- Follow the manufacture guidelines or your facilities guidelines for infection control for oxygen supplies
- Most cannulas are changed every two weeks to prevent contamination
- Connective tubing is replaced monthly

Cleaning
References:
- Home Care Institute (2010). Assisting patients with oxygen – Aide-in-service
- Home Care Medical Client Education forms
- National Fire Prevention Association
- Respiratory Home Care – The Essentials
- AARC – Clinical Practice Guidelines