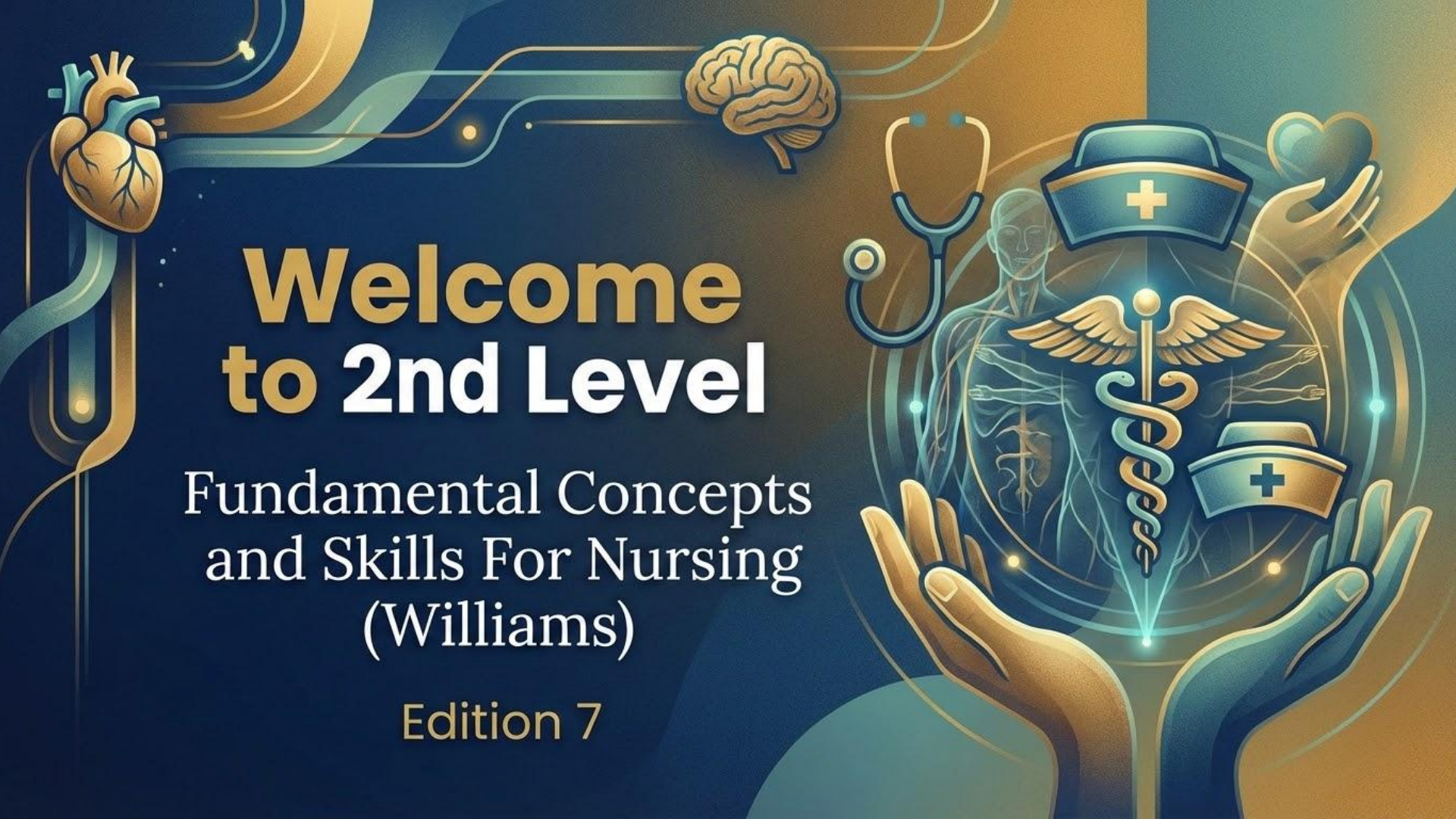

Welcome
to 2nd Level
Fundamental Concepts
and Skills For Nursing
(Williams)
Edition 7

Congratulations on making it to this Amazing Level

Commitment & Format

10hrs/week: Combination of both Theory and Skills Lab.

Expectations & Foundation

Cognitive thinking is expected. Building on your 1st Level knowledge.

Keys to Success

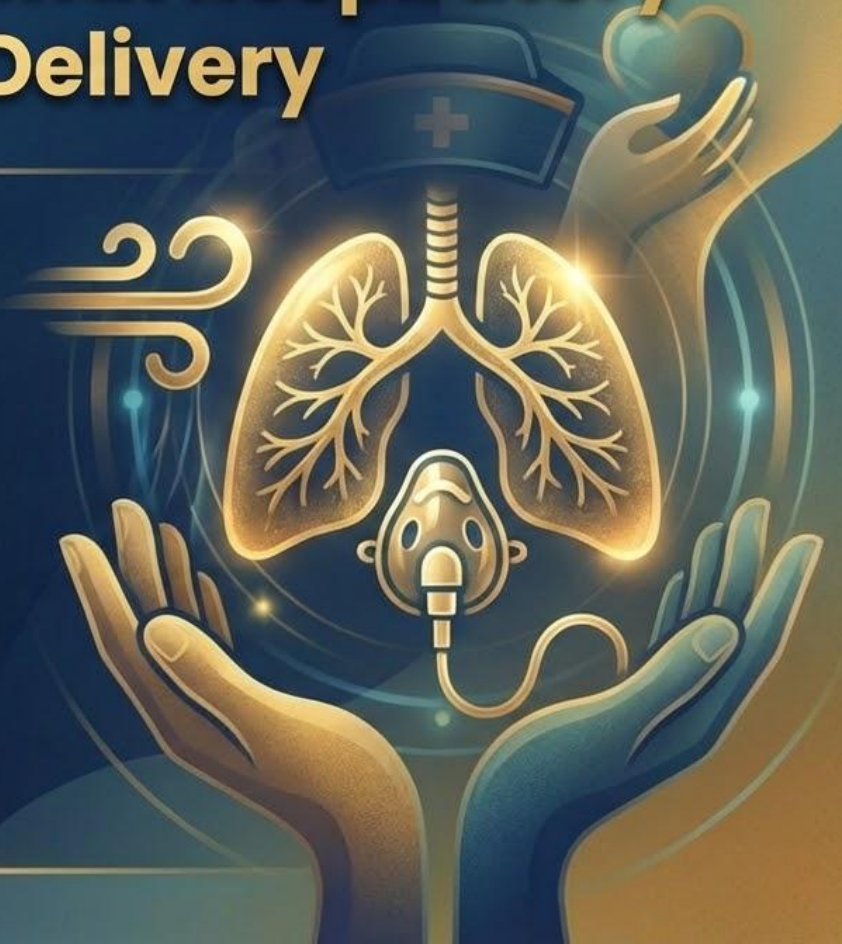
Study Habits & Tutoring are important. Read chapters before EACH class. Organize for 2 days early rise clinicals & 3 days didactic.

Next Steps

Read Advanced Skills Syllabi. Then, receive access to your Advanced Skills Quia page.

Chapter 29 Assisting with Respiratory and Oxygen Delivery

Pg. 257. Note: my powerpoint will not be uploaded to your QUIA page. However, you are able to record my lecture and take extra notes from my powerpoint and elaboration of content.



Upon completing this chapter, you should be able to do the following:

Theory

- Illustrate the functioning of the respiratory system.
- Recall at least three causes of hypoxia.
- Formulate steps to follow in the event of respiratory or cardiac arrest.
- Discuss the various methods used for oxygen delivery.
- List safety precautions to be observed when patients are receiving oxygen therapy.

Clinical Practice

- Prepare to assist patients in clearing the airway via coughing, postural drainage, suctioning, abdominal thrusts (Heimlich maneuver), and inhalation therapy.
- Demonstrate the regulation of oxygen flow and correctly apply an oxygen delivery device.
- Organize care for the tracheostomy patient.
- Manage care for a patient who has a chest tube and drainage system.

Chapter Skills Assessment

Which of these chapter skills will be tested:

Tested Skills Categories

Hands on Skills (HOS): Skill 29.1; Skill 29.4; Skill 29.6

Written Skills (WS): Skill 29.5; Skill 29.7

Theory (Th)

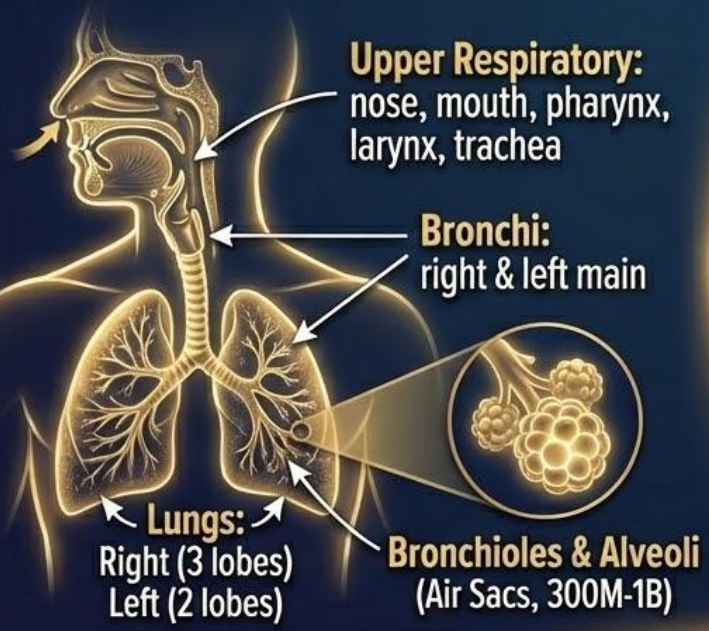
Important Course Notes

- Please be familiar with all key terms for success in written, hands-on, and theory tests.
- Homework grade from Ch. 29 Study Workbook, Pg. 281 - 289.
- Quizzes are given in class; NO make-ups.
- Attendance is extremely important in this and the next level.

Overview of the Structure and Function of the Respiratory System

Learning Objectives: Describe structure & function, including age-related changes. Describe structures.

Respiratory Structures



Breathing Mechanism (Inspiration & Expiration)

Inspiration:
Diaphragm contracts, cavity enlarges, air flows in (negative pressure)

Expiration:
Diaphragm relaxes, cavity decreases, air forced out

What Are the Functions of Respiratory Structures?

Learning Objective: Describe the functions of the respiratory system.

Mechanics & Control

- Chest muscles & diaphragm move air in/out.
- Respiratory muscles depend on nerve impulses from spinal cord.
- Thoracic cage allows muscles to function.

Airway & Defense

- Upper pathways carry, warm, & humidify air.
- Bronchi channel air; Cilia & mucus trap/remove foreign particles.
- Mucus assists cleansing; Cough reflex expels secretions.

Gas Exchange & Transport

- Alveolar macrophages phagocytize foreign particles.
- Oxygen diffuses into blood; CO_2 diffuses into alveoli.
- Blood transports O_2 (hemoglobin) & CO_2 (plasma).

Regulation

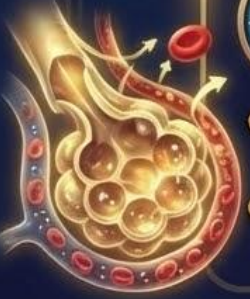
- CNS controls respiration (medulla & brainstem).
- Chemoreceptors sense O_2, CO_2, & pH changes.
- Signals adjust respiratory rate based on blood levels.

What Changes Occur With Aging That Affect Respiration?

Learning Objective: Recall age-related changes affecting respiratory function.

Decreased Elasticity & Volume

- Total body water decreases by 50% after age 70, leading to dry respiratory membranes and thicker mucus.
- After age 70 there is decreased elasticity of the thorax and respiratory tissues.



Reduced Gas Exchange

- Tissue changes cause thickening of the alveolar membrane, decreasing the ease of gas diffusion across the membrane.
- Oxygen saturation decreases, with the partial pressure of oxygen (PaO_2) dropping to 75–80mm Hg from the usual 80–100mm Hg.

Impaired Defense Mechanism

- Airway cilia experience some degree of impairment, decreasing their efficiency in removing mucus and foreign material.

Functional Impact

- There is a loss of elastic recoil during expiration, and respiratory muscles must be used to complete expiration.
- The older adult has less respiratory reserve, making it more difficult for the body to meet increased oxygen demands.

Hypoxemia

Learning Objective: Describe the causes, symptoms, and monitoring of hypoxia.

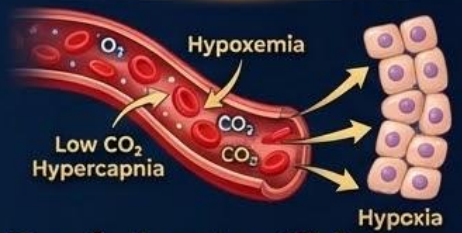
Nursing Priorities & Airway Management

- **Primary responsibility:** Maintain patent airway & adequate ventilation.
- Anoxia (no O2) slows metabolism, leads to cell death.
- Air contains ~21% oxygen.
- Obstruction is a common cause of insufficiency; often reversible (positioning, suctioning).

Oxygen Therapy & Monitoring

- Identify breathing problems promptly.
- Take action to relieve airway obstruction.
- Competently initiate or maintain oxygen therapy as prescribed.

Gas Exchange Disturbances



- **Respiratory Insufficiency:** Inability to meet O2 needs or remove excess CO2.
- **Hypoxemia:** Decreased O2 in bloodstream -> Hypoxia (low cellular O2).
- **Hypercapnia:** Increased CO2 level in the blood.

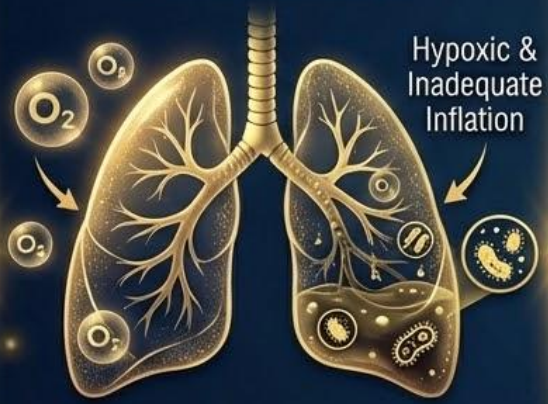
Environmental Causes

- **High altitude** (decreased oxygen in the atmosphere)

Infection Risk in Hypoxic Patients

Mechanism & Prevention

Increased Susceptibility & Mechanism



- Inadequate inflation results in pooling of secretions.
- Provides medium for growth of microorganisms.

Goal: Protection from HAIs

- Essential to protect from hospital-acquired infections.

Action: Restrict Access

- Personnel and visitors with respiratory tract infections must be kept out of the patient's environment.

Think Critically & Pulse Oximetry

How would you know a patient is in respiratory distress? What signs and symptoms might be present?

Learning Objective: Describe the use of pulse oximetry in monitoring patients at risk for hypoxia.

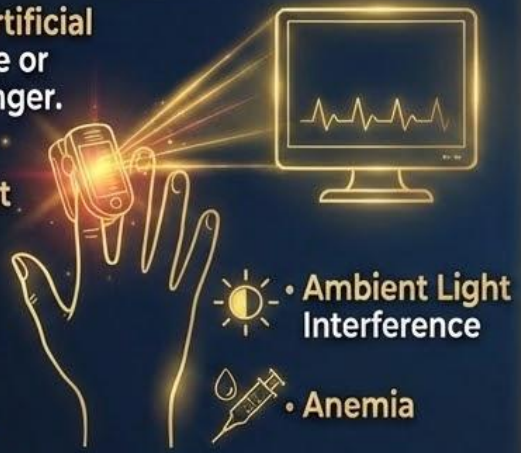
- Used for any patient at risk of hypoxia; monitors changes in arterial oxygen saturation continuously.
- Measures saturation by determining the percentage of hemoglobin bound with oxygen.
- Sensor/probe allows infrared and red light to reach the capillary bed (oxyhemoglobin absorbs more infrared).

Sensor Types & Considerations

- **Adhesive sensors:** Applied to nose or forehead (generally disposable).
- **Clip-on probes:** Used on earlobe, fingertip, toe, or infant's foot (may be reusable).
- **Note:** Pulse oximetry is not recommended in certain situations.

Clinical Goldmine: Pulse Oximetry Accuracy

- Nail Polish/Artificial Nails: Remove or use side of finger.
- Sensor Misplacement
- Cyanosis/ Cold Fingertips/ Reduced Pulses



- Ambient Light Interference
- Anemia
- Invasive Oxygen Saturation: See Chapter 25 for critical care procedures.

Airway Obstruction & Respiratory Arrest

- Choking Interventions: Heimlich Maneuver (Adults/Children >1 yr), Back Slaps/Chest Thrusts (Infants <1 yr).

- Cardiopulmonary Resuscitation (CPR)
  - Adult CPR (30 compressions: 2 breaths)
  - Hands-Only CPR: Push hard & fast (center of chest).
  - Training Kiosks: www.cpr.heart.org/en/kiosks

Clearing Respiratory Secretions & & The Effective Cough

Learning Objectives: Describe interventions for clearing secretions.
Describe patient teaching for deep breathing, coughing, and sputum collection.

The Problem & General Interventions

- **Mucus/secretions** obstruct free passage of air.
- **Deep breathing & coughing** are standard measures to clear secretions and prevent hypoxia.
- **Deep breathing** increases oxygenation, opens alveoli, and may precipitate coughing.

The Effective Cough Technique
(Patient Teaching)

1. **Sitting position** is most effective for forceful exhalation.
2. Take **two deep breaths**, inhale deeply again.
3. **Rapidly** and **forcefully exhale** with mouth open.
4. **Repeat** to move secretions up bronchial tree for easier expulsion.

⚠ • **Warning:** Ineffective coughing spasms can cause hypoxia, ruptured alveoli, or airway collapse.

Postural Drainage

Learning Objective: Summarize the use of postural drainage for clearing respiratory secretions.

Overview & Mechanism

- Clears secretions by using gravity to drain lung segments.
- Secretions move to bronchi for effective coughing & expectoration.

- **Inpatient:** Respiratory Therapist performs.
- **Community/Home:** Nurse teaches patient.

Procedure & Best Practices

Preparation: Nebulizer with bronchodilator/liquefying meds.

Auscultate lungs **BEFORE & AFTER.**

Duration: Maintain each position for 5–15 mins, 2–4 times daily as tolerated.

- **Optimal Timing:** Best results in the **MORNING.**
- Perform 45–60 minutes **BEFORE** a meal to prevent aspiration.

Post-Drainage Care & Percussion

Ensuring patient comfort and effective secretion clearance.

Mouth Care & Patient Comfort

- Offer mouth care **IMMEDIATELY** after postural drainage.
- Prevents appetite loss caused by bad taste from coughing up secretions.

- Prevents appetite loss caused by bad taste from coughing up secretions.

Percussion Technique & Assistance

Percussion: Rhythmic clapping with cupped hands over the thoracic area to loosen secretions and mucus plugs.

AVOID percussion over the spine or sternum.

AFTER percussion and drainage, assist patient to cough effectively and expectorate loosened secretions.

Why Postural Drainage & Percussion Should Be Avoided Around Meals?

Understanding the risks and ensuring patient safety and comfort.

Risk of Aspiration & Vomiting

- Full stomach increases risk of regurgitation.
- Positions and coughing can cause aspiration of stomach contents.

Reduced Effectiveness & Comfort

- Full stomach causes discomfort during procedures.
- Digestion draws blood flow away, potentially reducing clearance efficiency.

Optimal Timing: Wait at least **1-2 hours AFTER** a meal.
Perform **45-60 minutes BEFORE** a meal.

Oxygen Administration

Learning Objective: Discuss oxygen administration, including safety considerations and equipment use.

Purpose & Methods

Supplemental oxygen is ordered when the patient cannot maintain sufficient oxygen.

Administration methods include cannula, mask, tent, Croupette, or catheter.

Nurse's Role & Skill 29.4

Respiratory therapists usually set up and supervise equipment.

Nurses often **initiate therapy** or supervise its use on a PRN basis **(Skill 29.4).**

Oxygen Administration: Fundamentals & Safety

The Basics: Oxygen as a Drug

- Colorless, odorless gas.
- Requires prescribed order: flow rate, frequency, route.
- Monitor patient and wean quickly when not needed.

Critical Safety Risks

- **Supports Combustion:** High fire risk! Great caution required.
- **Dries Respiratory Tissues:** Can lead to cracking & infection (use humidifier).
- **Overuse Hazard:** Can create damaging free radicals or physiologic changes.

Equipment & Flow Rates

- **Key Equipment:** Source, Flowmeter (regulates amount), Humidifier (adds moisture), Tubing, Appliance.
- **Flow Rate:** Prescribed by provider (range 2-12 L/min; common 4-6 L/min).
- Adjust flow to prescribe level indicated on gauge.

Refer to Clinical Practice Guidelines (Table 29.3) for detailed protocols.

Safety Alert: Oxygen Therapy Safety

Fire & Combustion Risks

- Place **"No Smoking: Oxygen in Use"** signs clearly.
- **Prohibit smoking** by patients and visitors near oxygen.
- Check **electrical devices** for frayed wires; prevent sparks.
- **Avoid flammable materials**: oils, grease, alcohol, ether.

Environmental & Handling Precautions

- Use **cotton fabrics**; avoid materials that generate static.
- **Handle cylinders with care**; strap securely in stands.
- Position cylinders **away from heat** and heavy traffic.

Patient Monitoring

- **Monitor** for skin irritation from delivery devices.
- **Assess** for **dry mucous** membranes.
- Ensure **humidification** to prevent tissue breakdown & infection risk.

Vigilance and strict adherence to safety protocols are crucial for patient well-being.

Safe Oxygen Flow Rates

Obstructive Lung Disease Protocol

- Administer only **2–3L/minute.**
- Higher concentrations may **reduce respiratory rate.**
- Drive to breathe comes from **lower oxygen levels,** not higher carbon dioxide.
  (Patients often have chronically high CO_2 levels.)

Critical Verification

- **Carefully check** oxygen orders.
- **Always verify high flow rates** with the prescribing care provider.

Vigilance and strict adherence to safety protocols are crucial for patient well-being.

toxygen Delivery Systems & Mobility and travel for people who require

Humidifier Function & Maintenance

- **Attached to flowmeter;** moisturizes oxygen with water.
- **Check fluid level** periodically during the day.
- **Notify respiratory care** if fluid is low for refill/replacement.

Portable Oxygen Tanks

- Used in **home settings.**
- Essential for transporting **oxygen-dependent patients** within the hospital.

Oxygen Concentrators (Stationary & POCs)

- **Concentrates oxygen** from room air for storage/use.
- **Stationary** units require electrical outlet.
- **Portable** (POCs) are battery-operated for mobility & travel.
- **POCs vary in size** (coffee maker to carry-on luggage).

Ensuring proper equipment function and enabling patient mobility are key aspects of oxygen therapy.

Nasal Cannula

Description & Fit

- Plastic tube with **curved prongs** (¼ to ½ inch into nostrils).
- Held by **looping over ears**, cinched **under chin.**
- Easily **adjustable** for comfort.
- Optional **Velcro holder** for head to prevent ear pressure.

Nursing Considerations & Advantages

- **Check nares** for obstruction and skin irritation.
- **Monitor ears** for pressure injuries.
- Useful for patients requiring oxygen during meals.

The nasal cannula is a common, comfortable, and practical oxygen delivery device, especially during daily activities like eating.

Delegation to your Team Detecting Skin Irritation

Ask the assistive personnel (AP) to check the backs of the ears and the nares for tissue irritation when they assist the patient with morning care.

This is especially important for older adults, who have thin, easily damaged skin.

Proactive checks by the team are crucial for preventing pressure injuries in vulnerable patients.

Masks

Learning Objective: Recall the use, advantages, disadvantages, and nursing considerations of masks.

Various types of masks are available for the administration of oxygen in concentrations ranging from 24% to 55% at flow rates of 3–7L/minute (Fig. 29.8). Oxygen concentrations above 60% are rarely used because of the danger of oxygen toxicity.

Some patients dislike this method of oxygen administration because the mask must be placed over the face, and they feel claustrophobic.

Table 29.4 lists advantages and disadvantages. Oxygen tents, halos, Oxyhoods, or Croupettes are used for infants and small children.

Think Critically

How would you explain to a patient who has oxygen ordered by cannula PRN (as needed) when to use the oxygen?

Focus on patient understanding, symptom recognition, and safe usage.

Artificial Airways

Complications: Endotracheal Tubes

An endotracheal tube may cause a mucosal ulcer after 5–7 days of use, depending on cuff pressures or the type of cuff used.

Artificial Airways

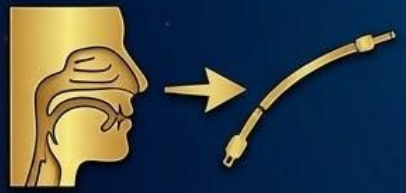
Complications: Endotracheal Tubes

To control the amount of pressure for suctioning, place the thumb over the suction port of the catheter or the open end of a Y connector between the tubing and the catheter.

Suctioning: Preventing Pathogen Introduction

Asepsis and Clean Technique

Upper Airway
(Clean Technique)



Clean technique and thorough hand hygiene are essential for pharyngeal suctioning of the oral and nasal cavities. Numerous microorganisms are present, making sterility nearly impossible.

Trachea
(Aseptic Technique - Mandatory)

Aseptic technique is mandatory for suctioning the trachea to prevent the introduction of pathogens into the lower airways. It is best to use aseptic technique for all suctioning of the airway structures.

Disposable Sets & Contamination Rule

Disposable sterile suctioning sets are widely used. Never reuse a catheter that has been used in the mouth for nasopharyngeal or tracheobronchial suctioning. Once the catheter has been in the mouth, it is contaminated.

Tracheobronchial Suctioning

Learning Objective: Purpose, Steps, and Considerations

- **Purpose:** Stimulates cough reflex, removes secretions from trachea & bronchi.
- **Indications:** Intubation or Tracheostomy (Skill 29.6).

- **Methods:** Open or Closed Suction System.

- **Sterile Technique:** MANDATORY for deep suctioning & intubated patients.

- **Procedure:** Use sterile saline/water to wet catheter.
- **Safety:** DO NOT suction for >10 seconds. Preoxygenate before.

CLINICAL GOLDMINE: Timing Suction. Hold your own breath or count '1–1000, 2–1000...' to '10–1000' to gauge the 10-second limit.

Tracheostomy

Learning Objective: Summarize use & nursing responsibilities.

Overview & Purpose

- **Surgical airway:** Incision & tube insertion to aerate lungs.

- **Indications:** Apnea, respiratory obstruction, prolonged ventilation.

- **Purpose:** Prevent aspiration, provide lower airway access.

Cuff Management & Safety

- **Cuffed tubes:** Inflate to seal trachea, prevent aspiration, ensure ventilation.

- **Procedure:** Check cuff pressure q8h. Suction pharynx **BEFORE** deflating.

- **Leak Check:** After reinflation, check for air leak (hand test).

CRITICAL SAFETY ALERT: Never leave patient alone when the cuff is deflated due to aspiration risk.

Chest Drainage Tubes

Learning Objective: Describe the use & nursing considerations of chest drainage tubes.

Purpose & Indications

- **Purpose:** Drain air/fluid from pleural space, prevent backflow, re-expand lung.

- **Indications:** Pneumothorax, hemothorax, pleural effusion, post-thoracic surgery.

Drainage Systems & Components

- **Types:** Disposable (water seal or waterless), mobile (for discharge), autotransfusion.

- **Key Components:** Collection chamber, water seal (prevents air entry, check for bubbling), suction control.

Removal & Nursing Care

- **Removal Criteria:** Lung reinflated (CXR confirms), drainage decreased. Removed by physician/RN.

- **Procedure:** Suture removal, Valsalva maneuver, apply occlusive dressing.
- **Comfort:** Premedicate with analgesic before removal for patient comfort.

Maintaining a Disposable Water Seal Chest Drainage System

Review and carry out Standard Steps in Appendix A. Ensure unit function.

1. System Setup & Positioning

1. Position unit BELOW chest level. Tubing straight, no loops.
   (Ensures gravity drainage.)
2. Fill water seal chamber to correct level with sterile water.
   (Creates one-way valve, prevents air entry.)
3. Attach to wall suction, set to ordered amount (e.g., 20cm H2O). Check for mild bubbling.
   (Bubbling indicates suction is working; excess pressure damages lungs.)

2. Tubing Patency & Safety

4. Tape all connections.
   (Prevents accidental disconnection.)
5. Ensure NO kinks in tubing.
   (Kinks block drainage, cause fluid pooling.)
6. Frequently lift tubing to drain stagnant blood.
   (Maintains patency, prevents clots.)
7. DO NOT milk or strip tubing unless ordered. (Increases negative pressure; not needed with continuous suction.)

3. Monitoring & Patient Care

8. Mark & record drainage output each shift. Report >100mL/hr.
   (Monitors blood loss/fluid accumulation.)
9. Encourage deep breathing, coughing, and position changes.
   (Assists lung re-expansion.)
10. Assess pain level and medicate as ordered.
    (Improves deep breathing efficacy; chest tubes are uncomfortable.)

Application of the Nursing Process: Clinical Judgment & Respiratory Care

Learning Objectives: Apply nursing process in respiratory care. Summarize focused respiratory assessment.

Assessment (Data Collection): Recognize Cues

- **Basic Respiratory Assessment (Chap 23):** Auscultate lungs each shift. Assess all respiratory parameters.
- **Documentation:** Carefully document findings for trend analysis and early detection of deterioration.

- **Cardiac Connection:** Respiratory and cardiac functions are intertwined. Impaired heart function affects oxygen delivery.

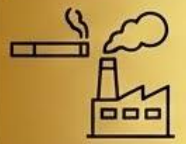
- **Equipment Check:** Verify respiratory equipment settings and function at least once per shift.

Focused Assessment: Interviewing the Patient With a Respiratory Problem

Ask these questions for any patient with respiratory problems or diagnoses.

1. History & Symptoms

- When did the problem begin? Exposed to infection? Symptoms? Shortness of breath?
- What type of cough? When does it occur? Productive? Sputum color?
- When does shortness of breath occur? Is there wheezing?



2. Habits & Exposures

- Do you smoke? Packs/day? Years?
- Exposure to industrial air pollutants? Tuberculosis?
- Allergies? Sinusitis? Asthma? Emphysema? Chronic bronchitis? Exposure to dust/irritants?

3. Management & Related Conditions

- What measures ease breathing or cough? Medications?
- How much fluid are you drinking?
- Do you have any heart problems?

Developing Skill in Detecting Breath Sound Abnormalities

Key Strategies for Skill Acquisition & Mastery

1. Frequent Auscultation & Practice

- Listen to a wide variety of patients. Build a mental library of normal vs. abnormal sounds.
- Compare findings with patient history and clinical picture.

2. Utilize Simulation & Audio Resources

- Use high-fidelity mannequins and lung sound simulators.
- Access validated online audio databases and training modules for targeted practice.

3. Seek Expert Validation & Mentorship

- Review findings with experienced preceptors or instructors.
- Receive feedback on technique and interpretation to refine skills.

Data Analysis/Problem Identification

Learning Objective: Describe patient problem statements and expected outcomes for patients with respiratory problems.

Analyze Cues and Prioritize Hypotheses: Common problem statements

- Alteration in airway clearance related to muscle weakness and impaired cough, decreased level of consciousness, or thick secretions.
- Altered gas exchange related to retained respiratory secretions.

Potential Risks

- Potential for infection related to alteration in airway (tracheostomy).
- Potential for injury related to improper safety precautions when using oxygen.

Knowledge & Safety

- Insufficient knowledge related to use of oxygen equipment, tracheostomy, ventilator, or incentive spirometer.

Planning: Sample Goal & Expected Outcome

- Patient demonstrates proper safety techniques when using oxygen.

Focused Respiratory Assessment

- Assess respirations: rate, depth, and character.

- Auscultate the lungs to assess the patency of the airways.

- Assess for subtle signs of hypoxemia.

- Assess the mucous membranes and nail beds for signs of cyanosis.

- Assess the character of the cough, if present.

- Assess the amount and character of sputum and times when it is produced effectively.

- Assess for factors that restrict respiratory effort.

Planning

Learning Objective: Describe the elements of a nursing care plan for a patient with altered gas exchange.

Generate Solutions: Sample goals or expected outcomes:

Patient demonstrates effective cough.

Lungs are free of secretions.

Patient demonstrates proper suctioning of the tracheostomy with aseptic technique.

Area of left lobe atelectasis (collapsed area of the lung) is resolved.

Patient demonstrates proper safety techniques when using oxygen.

Planning Respiratory Care in Daily Workflow

Learning Objective: Describe the elements of a nursing care plan for a patient with altered gas exchange.

Daily Routine & Documentation

- Fit appropriate care into the daily work plan.

- Turn, Cough, and Deep Breathe (TC&DB) every 2 hours.

- Note TC&DB times on the shift work organization sheet.

Procedures & Resource Management

- Schedule procedures such as postural drainage or tracheostomy care.

- Plan time for frequent suctioning for copious secretions.

- Ensure necessary respiratory supplies are at the bedside.

Implementation

Learning Objective: Determine nursing interventions for patients with various respiratory problems.

Nurse's Active Role & Infection Prevention

- Help patient perform respiratory exercises & teach respiratory care.

- Maintain patient safety & offer encouragement.

- Prevent complications & hospital-acquired infections to assist recovery.

Airway Maintenance & Secretion Management

- Encourage effective coughing, turning, & deep breathing.

- Splint incisions with a small pillow for effective coughing.

- Encourage fluid intake (1500–2000mL/day) to thin secretions.

- Use aseptic suction for copious secretions or unconscious patients.

Advanced Airway & Oxygenation Support

- Use oral or nasal airway for unconscious/comatose patients.

- Use manual resuscitator bag if oxygenation is inadequate.

- Proper positioning & frequent turning.

- Encourage yawns, sighs, & use of incentive spirometer to open alveoli.

Respiratory Complications & Nursing Interventions

Learning Objective: Identify early signs of hypoxia and manage postoperative older adults, confusion often is seen as oxygen levels fall. Observe patients with respiratory problems closely for these early symptoms.

Patients who have undergone abdominal or chest surgery may avoid using muscles in the affected areas because deep breathing and coughing can cause pain.

Signs of Hypoxia

- **Restlessness** and **irritability:** First signs.
- **Confusion:** Often seen in older adults as oxygen levels fall.
- Observe closely for these early symptoms.

Postoperative Breathing & Coughing

- Patients avoid deep breathing/coughing due to pain.
- Muscles are necessary to clear secretions.
- Medicate adequately for pain to facilitate coughing.
- Splint incisions to reduce discomfort.

Risks of Inadequate Ventilation

- **Hypoxia, Pneumonitis, Atelectasis:** Prolong hospitalization.
- **Atelectasis:** Alveoli collapse, fail to fill with air.
- Can be acute or chronic, involving part or all of lung.

Prevention of Respiratory Complications

Learning Objective: Determine nursing interventions for patients with various respiratory problems.

Splinting for Comfort

- Make a small ‘pillow’ with a large towel in a pillowcase.
- Help patient splint incision during deep breathing or coughing.
- Reduces pain & makes efforts more successful.

Alveolar Reinflation

- Prevent complications by reinflating alveoli.
- Sustained maximum inspiration: Deep breath, hold for ≥3 seconds.
- Yawning or sighing also produces this effect.

Secretion Clearance

- Remove secretions to prevent complications.
- Flutter device assists in gently vibrating airways.
- Loosens mucous from bronchial walls to improve airflow.

Prevention of Respiratory Complications

Incentive Spirometry & Deep Breathing

- Encourages sustained maximum inspiration exercises.
- Visual feedback (ball/volume) motivates patient.
- Hold breath for 3–5 seconds to reinflate alveoli.
- Recommended: 10 slow, deep breaths every hour while awake.

Positioning & Relaxation Techniques

- Optimizes respiratory exchange, reduces energy expenditure.
- Helps anxious/dyspneic patients relax tense muscles.
- High Fowler’s position for bed patients; support arms.
- Orthopneic position for obstructive diseases (e.g., emphysema).
- Turn patients to prevent secretion pooling; assist with postural drainage.

Oxygen Therapy & Activity Management

Oxygen Therapy & Care

- Administer ordered amount of oxygen.
- Perform oral hygiene every 3–4 hours (drying effect).
- Inspect skin around nose/mouth for irritation.
- Change equipment per agency policy to prevent infection.
- Use tympanic, temporal, or rectal temperature measurement.

Activity & Mobilization

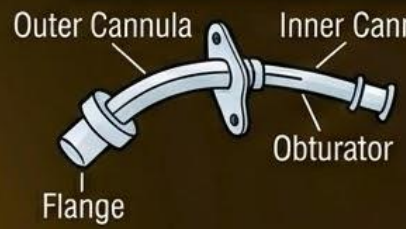
- Monitor for shortness of breath (SOB), dizziness, or chest pain.
- Space activities with sufficient rest periods.
- For PRN oxygen: Do not discontinue immediately before activity.
- Allow time to adjust to room air before increasing activity.

Relief for Shortness of Breath: Orthopneic Position

Position the person who is very short of breath in the orthopneic position, using pillows on the over-the-bed table and in a chair.

Tracheostomy Tubes & Care

Tracheostomy Tube Overview



- Curved, hollow cannula (plastic or metal).
- Some have removable inner cannula for cleaning.
- Obturator facilitates tube insertion, then removed.
- Keep extra tube and obturator at bedside for emergencies.

Daily Tracheostomy Care

- Daily care required for temporary or permanent tracheostomies.
- Includes suctioning, cleaning stoma skin, and changing dressing.
- Clean inner cannula (if present) and replace soiled ties.
- Perform every 8 hours or PRN to prevent secretion buildup and airway blockage (Skill 29.7).

Communication & Safety for Tracheostomy Patients

Alternative Communication Methods

- Tracheostomy prevents natural speech.
- Provide paper & pencil, magic slate, communication board, or electronic devices.
- Facilitate effective expression of needs.

Call Light Accessibility & Safety

- Vital to have call light at hand at all times.
- Inability to call for help is frightening.
- Check on the patient frequently to ensure safety and comfort.

Tracheostomy Care: Suctioning & Cleaning

Tracheostomy Suctioning

- Critical for airway patency; patients cannot cough effectively.
- Assess respirations and lung sounds before suctioning.
- Frequency varies; new tracheostomies may need q15–30 min.
- Indications: audible respirations, visible secretions, increased resistance, dyspnea (Skill 29.6).
- Use strict aseptic technique; separate catheters for nasopharyngeal and tracheal.
- Limit suction to 10 seconds; preoxygenate to prevent hypoxemia.

Inner Cannula Care

- Clean as needed to remove tenacious secretions and crusts (Skill 29.7).
- Use aseptic technique for wound and inner cannula.
- Work calmly; tracheostomy is traumatic for the patient.
- Always suction the nasopharynx before deflating the cuff.

Chest Tube Care

Routine Assessment & Monitoring

- Auscultate lungs frequently to assess re-expansion.
- Observe tube and drainage level on every room entry (see Steps 29.1).

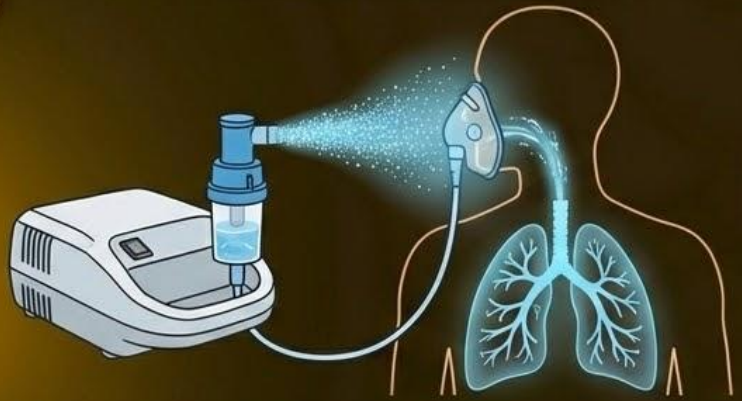
Drainage Management & Critical Alert

- Measure drainage every 1, 2, 4, or 8 hours.
- Mark level and time on the container.

Immediately report drainage of > 100mL/hour.

Nebulizer Treatments

Mechanism of Action



Medication is changed from a liquid into a mist for easy absorption through lung tissue.

Indications & Administration

- Used for difficulty bringing up trapped mucous secretions.
- Delivers bronchodilators to relieve bronchospasm.
- Often administered by nurses in clinics and medical offices (Fig. 29.20).

Patient Education

Because many respiratory patients have chronic problems, patient education for self-care is important for them to achieve independence.

Permanent Tracheostomy Care

- Teach to suction properly in an aseptic manner.
- Care for the tube, the stoma, and the skin.

Respiratory Health Practices

- Teach all patients to deep breathe effectively.
- Teach effective coughing techniques.

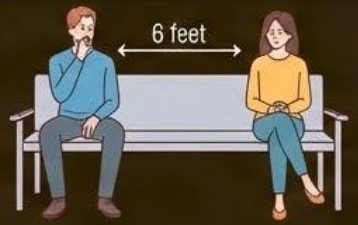
Preventing Respiratory Tract Infection

Remind patients with respiratory problems to:

Avoid Crowds

- Avoid crowded places (theaters, malls) with flu or infection risk.
- Close contact with people places compromised respiration at risk.

Maintain Distance



- Sit a good distance (6 feet or more) away from anyone who is coughing or sneezing.

Reduce Home Pollutants

- Teach home care patients to reduce air pollutants in the home and avoid them elsewhere.

Suctioning at Home

Home Suctioning Guidelines

- Teach caregiver and family members aseptic suctioning technique and signs indicating need.
- Some patients can learn self-suctioning, but it's uncomfortable and may not be fully effective.
- After suctioning, wait ~10 minutes if secretions remain to allow reoxygenation before resuming.
- Note date and time on covered catheter container; change catheter every 8 hours.

Cleaning & Storage

- Teach patient and caregiver to clean suction equipment with hydrogen peroxide, gentle soap and water, or household bleach solution (depending on equipment type); rinse with sterile water; and store in a clean container until next use.

Evaluation

Evaluation

- **Learning Objective:** Determine whether patient outcomes related to respiratory problems were met using the evaluation step of the nursing process.

It is vitally important to evaluate the patient's respiratory status continually when the patient is suffering from a respiratory disorder. Evaluate the lungs at least once per shift. Evaluate the success of respiratory treatments and medications daily. Sample evaluation statements are:

- Effectively coughing up secretions.

- PaO_2 increased to 88mm Hg.

- $PaCO_2$ (partial pressure of carbon dioxide) decreased to 38mm Hg.

- Patient able to ambulate length of hall without SOB.

- Lungs clear, no sign of respiratory infection.

- Patient turns off oxygen when not using it.

- Atelectasis cleared as evidenced by x-ray.

Documentation

Documentation should include:

- Data from the respiratory assessment 
- Oxygen flow rate and method of delivery 
- Amount of time PRN oxygen is used 
- Time and location of the blood gas sampling 
- Location of the oxymetry probe and range of oxygen saturation 
- Description of the sputum expectorated 
- Times the patient deep breathes and coughs 
- Time and result of any respiratory treatments 

Constantly evaluate suction technique, considering ways to improve in delivering respiratory care. It takes considerable practice to suction efficiently.

Understanding the Key points

At the end of the Chapter
Will help you be successful
In learning the content and get you NCLEX ready!