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Oxygenation and Respiratory Care

Nursing Foundation

Oxygen therapy, oxygen delivery devices, nebulisation, suctioning, deep breathing exercises, coughing techniques, chest physiotherapy and respiratory nursing care.

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CHAPTER 15

CHAPTER 15 Oxygenation and Respiratory Care

B.Sc. Nursing | Nursing Foundation I & II

Meaning and assessment

Oxygenation provides oxygen to blood and tissues. Ventilation moves air, diffusion exchanges gases, perfusion supplies blood and oxygen transport delivers oxygen to cells. Causes of impairment include airway obstruction, respiratory/cardiac disease, anaemia, immobility and neuromuscular weakness. Assess respiratory rate, effort, breath sounds, SpO2, mental status and work of breathing. Cyanosis may be a late sign; escalate acute distress immediately.

Oxygen therapy and devices

Oxygen is administered to an individualized target, under authorized orders or emergency protocol. Typical adult devices:

Device	Usual flow and delivery
Nasal cannula	1-6 L/min; variable approximately 24-44% oxygen.
Simple mask	5-10 L/min; variable concentration; do not use below device minimum.
Venturi mask	Manufacturer-specific flow; selected fixed oxygen concentration.
Non-rebreather mask	Often 10-15 L/min; high variable concentration, keep reservoir inflated.
High-flow nasal cannula	Specialized heated humidified system; prescribed settings.

BTS guidance commonly targets 94-98% in many acutely ill adults and 88-92% in those at risk of hypercapnic respiratory failure pending assessment. Local/individual targets take precedence. Verify supply and device, explain, apply correctly, titrate within authorized protocol, monitor saturation and response, inspect pressure areas and record settings. Oxygen supports combustion: no smoking/flames, secure cylinders and use compatible products.

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CHAPTER 15

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Nebulization

Converts prescribed medication into aerosol. Verify medicine, dose and device, assess breathing, position upright if possible, administer per manufacturer/order, monitor response/adverse effects and clean or dispose of equipment correctly. Follow infection precautions for aerosol-generating procedures where indicated.

Suctioning

Removes secretions when cough is inadequate. Routes include oral, nasopharyngeal, endotracheal and tracheostomy. Perform only when indicated and trained; assess oxygenation, use appropriate catheter and suction settings, sterile technique for open artificial-airway suction, preoxygenate when indicated, minimize pass duration (generally no more than 15 seconds for artificial-airway suction in adults), monitor heart rate/SpO2 and stop if deterioration. Do not routinely instill saline into artificial airways.

Breathing, coughing and chest physiotherapy

Encourage controlled deep breaths, effective cough/huff cough and rest; support incision when appropriate. Incentive spirometry may be used when prescribed, combined with mobilization and analgesia. Chest physiotherapy includes selected postural drainage, percussion, vibration and breathing techniques; assess indications and contraindications with physiotherapy/clinical team.

Nursing responsibilities and exam revision

Maintain airway, assess changes, support positioning/clearance, administer authorized treatment, prevent infection and escalate deterioration. Document device, flow, target and response.

1. 1. Describe oxygen delivery devices and oxygen safety.
2. 2. Explain nebulization, suctioning and airway clearance.
3. 3. Discuss respiratory assessment and nursing responsibilities.

Reference

British Thoracic Society. Guideline for oxygen use in adults. https://thorax.bmj.com/content/72/Suppl_1/ii1

Educational notes. Clinical skills require supervision, authorized orders and current facility protocols.

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Quick Revision

- Ventilation moves air, diffusion exchanges gases, perfusion supplies blood and transport delivers oxygen to cells.

- Respiratory assessment includes rate, effort, sounds, SpO2, mental status and work of breathing.

- Oxygen is given to an individualized target under authorized orders or emergency protocols.

- Venturi masks provide selected fixed concentrations; other standard devices have variable delivery.

- Oxygen supports combustion: exclude flames and smoking, secure cylinders and use compatible products.

- Suction only when indicated and trained, monitor response and avoid routine saline instillation into artificial airways.

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Practice questions

Choose one best answer. The answer key and explanations follow the questions.

1. Which process moves air into and out of the respiratory system?

A. Perfusion

B. Diffusion

C. Ventilation

D. Oxygen transport

2. Which device provides a selected fixed oxygen concentration?

A. Simple mask

B. Venturi mask

C. Standard nasal cannula

D. Non-rebreather mask

3. What does nebulization do?

A. Removes pleural fluid

B. Measures lung volume

C. Samples sputum

D. Converts prescribed medication into aerosol

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Answer key and explanations

1. C - Ventilation

Ventilation is the movement of air.

2. B - Venturi mask

A Venturi mask supplies a selected fixed concentration using manufacturer-specific flow.

3. D - Converts prescribed medication into aerosol

Nebulization converts medicine to an aerosol for administration.

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