The fourth edition of the Core Curriculum for Medical-Surgical Nursing presents a comprehensive body of knowledge to support the Academy of Medical-Surgical Nurses’ vision of leadership for medical-surgical nursing practice. Designed for new and experienced nurses caring for adult patients with one or more disease processes in a broad spectrum of settings, this edition of the Core Curriculum for Medical-Surgical Nursing has been reorganized and expanded in response to requests from the readers.

New features in the fourth edition include:

- New chapters to address the management of patients with mental health issues in the medical-surgical setting as well as the domains of professional nursing practice.
- The integration of key regulatory requirements and evidence-based practice standards.
- Revised chapter formats to assist readers with finding information.
- Increased emphasis on the needs of special populations, such as older adults and bariatric patients.

Authors for each chapter were selected based on their expertise, and their work was critically reviewed by practice experts to ensure it meets the needs of the practicing nurse. However, with the rapidity of change experienced within health care, no single reference can adequately address all topics. Readers are encouraged to review the references provided as additional readings, participate in continuing education activities, and review current literature to enhance their knowledge base.

The fourth edition of the Core Curriculum for Medical-Surgical Nursing maintains the longstanding tradition of providing the practitioner with:

- A foundation for practice in the area of adult health nursing.
- A reference for review of particular areas of practice within medical-surgical nursing.
- A guideline to prepare for the medical-surgical certification examinations, particularly the exam offered by the Medical-Surgical Nursing Certification Board leading to the Certified Medical-Surgical Registered Nurse (CMSRN) credential.
- A template for organization of review courses that focus on adult health nursing.
- A resource for obtaining continuing nursing education (CNE) contact hours in medical-surgical nursing practice.

Without the efforts of the authors and the dedication of the reviewers in producing a publication that is comprehensive, organized, and reflects current nursing practice, this edition would not be possible. In addition, I would like to express my deep gratitude to the AMSN Board of Directors and to the staff of Anthony J. Jannetti, Inc., especially Kathleen Thomas and Linda Alexander, for their patient, supportive advice and assistance.

Heather Craven, MS, RN, CMSRN
Editor
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Objectives

Study of the information presented in this chapter will enable the learner to:
• Apply the principles of the nursing process to patient education.
• Create a teaching plan incorporating principles of adult learning.
• Adapt a teaching plan to accommodate the unique needs and abilities of the patient.
• State methods to evaluate learning.

Key Points

• It is important to develop an education plan based on an assessment of the patient’s learning needs and potential barriers to learning.
• Principles of adult learning are essential when planning and implementing education for an adult patient.
• Patients are assumed to be autonomous individuals whose ability to self-manage their wellness and disease processes must be respected and supported.
• A key component of the education process is evaluating the patient’s understanding of information presented and their ability to implement recommended changes.
I. Description of Patient/Family Education

A. Definitions.
   1. Education process: deliberate and planned course of action consisting of teaching and learning which parallels the Nursing Process of Assessment, Planning, Implementation, and Evaluation.
   2. Teaching: intervention based on assessment and planning, which is intended to meet specific learning outcomes.
   3. Learning: process in which a change in behavior, skills, attitudes, or knowledge occurs.

II. Nursing Care

A. Assessment in patient education. Nurses must empower patients and respect patients’ self-concept as independent, responsible individuals who will make their own decisions about what they want to learn and how they wish to learn.
   1. Assess learning needs.
      a. A learning need is a discrepancy between present and desired knowledge or performance.
         (1) Patient must identify this discrepancy.
         (2) Nurse may need to help patients explore their current health-related behaviors and their desired goals in order to assist learners to recognize discrepancies.
      b. Distinguish between learning needs and non-learning needs.
         (1) True learning needs are based on patient’s goals that can be met by providing instruction.
         (2) A non-learning need is a discrepancy caused by something other than a need for information. For example, patient lacks motivation to change behavior.
   2. Assess readiness to learn, motivation.
      a. Adults are ready to learn skills, knowledge, or behaviors that they believe they need to know in order to cope effectively with their condition(s).
         (1) Determine if the adult perceives the material to be relevant and immediately applicable to them.
         (2) Nurse may enhance patient’s motivation to learn by emphasizing how new information, skills, behaviors, etc., will help patient meet personal goals.
         (3) Determine person’s internal desires and personal goals, not someone else’s expectations or goals.
   3. Assess preferred learning style.
      a. Learning is more effective when educational material is presented in the manner in which learner prefers to receive it (see Table 1-1).

Table 1-1
Learning Styles

<table>
<thead>
<tr>
<th>Assess Learning Style</th>
<th>Teaching Method</th>
<th>Evaluation of Learning</th>
<th>Example 1: Insulin Administration</th>
<th>Example 2: Diet Education for the Diabetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reading</td>
<td>Provide verbal explanations, lectures, videos, audiotapes, group or one-on-one discussion.</td>
<td>Ask the patient to “teach back” by repeating information in their own words.</td>
<td>Describe skill orally, talk through demonstration, and have patient talk you through their return demonstration.</td>
<td>Discuss diet, read food lists aloud. Have patient verbally describe a daily menu.</td>
</tr>
<tr>
<td>• Seeing</td>
<td>Demonstrations, checklists, list-making, role-playing, discussion, games, interactive computer programs.</td>
<td>Ask patient to make a list or take notes during instruction, return demonstrations.</td>
<td>Have patient manipulate syringe, insulin while you do demonstration. Allow patient to return-demonstrate skill.</td>
<td>Have patient sort pictures of food into appropriate menu choices. Have patient create diet journal.</td>
</tr>
<tr>
<td>Auditory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kinesthetic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Feeling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Touching</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Moving</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
I. Overview

A. Primary function of lungs is respiratory gas exchange.
   1. Respiratory or external gas exchange occurs at interface of alveoli and pulmonary capillaries, whereas tissue or internal gas exchange occurs at interface of systemic capillaries and tissue membranes.
   2. Lungs are primary source of oxygen for tissues in body and primary exit route for carbon dioxide from body.
   3. Oxygen, necessary for cellular metabolism, diffuses from alveoli into pulmonary capillaries for transport to metabolically active tissues.
      a. Partial pressure of oxygen (PO2) allows for diffusion of oxygen from alveoli into pulmonary capillaries and diffusion of oxygen from systemic capillaries into tissues for cellular metabolism.
      b. Oxygen remains dissolved (unbound) in blood or becomes bound to hemoglobin.
         (1) Dissolved oxygen diffuses across tissue (cell) membranes from systemic capillaries for use in cellular metabolism.
         (2) Hemoglobin releases oxygen for use by tissues. Certain conditions (body temperature) that change the tissue requirements for oxygen can cause hemoglobin to release oxygen (hyperthermia) or increase binding with oxygen (hypothermia).
   c. Amount of oxygen in body can be measured in two ways.
      (1) Partial pressure of oxygen (PO2) on arterial blood gas.
      (a) Normal: 60-100 mmHg.
      (2) Pulse oximetry measures the percentage of oxygen attached to hemoglobin.
      (a) Normal: greater than 90%.
      (b) Reading of 90% indicates the PO2 is at least 60 mmHg.
   4. Carbon dioxide, a waste product of cellular metabolism, diffuses from tissues into systemic capillaries and is carried to lungs where carbon dioxide diffuses from pulmonary capillaries into alveoli for elimination via exhalation.
      a. Partial pressure of carbon dioxide (PCO2) allows for diffusion of oxygen from tissues into systemic capillaries and diffusion of PCO2 from pulmonary capillaries into alveoli for elimination from body.
      b. Normally, the amount of carbon dioxide made in tissues is same amount that is exhaled from body with each breath.
      c. Carbon dioxide travels in systemic vascular system in three forms:
         (1) Dissolved: exhaled from body through lungs.
         (2) Bound to hemoglobin (carboxyhemoglobin)
         (3) Carbonic acid (H\textsubscript{2}CO\textsubscript{3}) which can break down in two ways.
            (a) Carbon dioxide (CO\textsubscript{2}) + water (H\textsubscript{2}O).
            (b) Hydrogen ions (H or pH) and bicarbonate (HCO\textsubscript{3}^-).
            (c) The above two processes provide basis for regulation of body's acid-base balance.
      d. Carbon dioxide levels are measured in three ways.
         (1) Serum carbon dioxide.
            (a) Normal value: 22-30 mEq/l.
         (2) Partial pressure of carbon dioxide (PCO2) on arterial blood gases.
            (a) Normal value: 35-45 mmHg.
         (3) End-tidal carbon dioxide levels measure the amount of carbon dioxide exhaled via the endotracheal tube.

5. See Table 15-1 for steps to interpreting arterial blood gases (ABGs).

<table>
<thead>
<tr>
<th>Table 15-1 Steps to Interpreting Arterial Blood Gas Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assess pH: if &gt; 7.45 = alkalosis; if &lt; 7.35 = acidosis.</td>
</tr>
<tr>
<td>2. Assess pCO\textsubscript{2}: if &gt;45 = respiratory acidosis; if &lt; 35 = respiratory alkalosis.</td>
</tr>
<tr>
<td>3. Assess HCO\textsubscript{3}^-: if &gt; 28 = metabolic alkalosis; if &lt; 21 = metabolic acidosis.</td>
</tr>
<tr>
<td>- An abnormal parameter (respiratory or metabolic, or both) that matches an abnormal pH (acidotic or alkalosis) defines the state of acid-base imbalance.</td>
</tr>
<tr>
<td>- The body attempts to compensate for abnormal states of pH. Compensation is partial if pH is abnormal. The parameter not causing that abnormality is shifted in the opposite direction. Compensation is full if pH is normal but pCO\textsubscript{2} and HCO\textsubscript{3}^- are abnormal.</td>
</tr>
<tr>
<td>4. Assess pO\textsubscript{2}: if &lt; 60 = hypoxemia</td>
</tr>
<tr>
<td>5. Assess hemoglobin saturation: if &lt; 90% = desaturation.</td>
</tr>
</tbody>
</table>
(3) Tympanic sounds may be heard over an area of hyperinflated lung.

4. Auscultation of chest.
   a. Vesicular breath sounds are low-pitched, soft, breezy sound heard over lung fields. Inspiratory phase is longer and more audible than expiratory phase. Normally heard in peripheral lung fields.
   b. Bronchovesicular lung sounds are harsh, moderate in pitch and intensity, heard over thorax where bronchi are closest to chest wall. Inspiration is equal to expiration in duration. Normally found at the edges of sternum or scapula. Abnormal if heard in peripheral lung fields.
   c. Bronchial breath sounds are loud, harsh, with a blowing, hollow quality. Expiratory phase is longer than the inspiratory phase. Normally heard over sternum or trachea. Abnormal if heard in peripheral lung fields.
   d. Adventitious sounds.
      (1) Crackles are more commonly heard on inspiration and generally associated with moisture in smaller air passages and alveoli.
      (2) Rhonchi are an expiratory sound caused by bronchial narrowing due to inflammation, fluid, or obstruction.
      (3) Wheezes are a whistling or musical sound caused by air rushing through narrowed airways during exhalation. Wheezes may be heard also on inspiration and may be audible without a stethoscope.
      (4) Pleural friction rubs are caused by inflamed surfaces of the pleural membranes moving against each other.
      (5) Snoring is a rough, rattling breath caused by vibration of the pendulous palate or vocal cords with sleep or coma.
      (6) Stridor is a high-pitched inspiratory sound associated with upper airway obstruction. May signify need for emergency airway protection.
      (7) Voice sounds heard while auscultating chest.
         (a) Bronchophony. Abnormally loud transmission of the spoken word “99” through an area of increased lung density.
         (b) Whispersed pectoriloquy. With patient whispering “1, 2, 3, 19” auscultate chest over area of suspected abnormality. If heard indistinctly, considered normal. If heard distinctly, suspect consolidation.

(c) Egophony. Have patient repeat letter “E.” If heard as “E,” this is considered normal. If heard as an “A,” this indicates an area of consolidation.

IV. Diagnostic Assessment

See Table 15-3.

PHYSIOLOGIC ALTERATIONS OF THE RESPIRATORY SYSTEM

I. Disorders of the Airways

A. Chronic obstructive pulmonary disease (COPD).
   1. Definition.
      a. A disease state characterized by airflow limitation that is not fully reversible.
      b. Airflow limitation is usually both progressive and associated with abnormal inflammatory response of lungs to noxious particles or gases.
      c. Expiratory airflow limitation, best measured through pulmonary function testing, is key to diagnosis of this disease.
      d. Among the conditions associated with COPD are chronic bronchitis and emphysema.
      e. Disease process is one of periodic exacerbations, especially as a result of a respiratory infection.
   2. Pathophysiology.
      a. Several factors cause airway obstruction, including inflammation and mucosal edema, excessive mucus production, loss of elastic supports to airways, and bronchoconstriction.
      b. Airway obstruction is always more pronounced on expiration, due to airway narrowing that occurs normally with expiration.
      c. Inflammation and edema of mucosal lining of airways result from chronic irritation and lead to airway lumen narrowing and trapping of air in the alveoli, especially during expiration.
      d. Predominant pathology in chronic bronchitis type of COPD is excessive mucus production and ciliary dysfunction leading to secretions that are copious and difficult to clear from airways.
      e. Predominant pathology of emphysema type of COPD is destruction of elastic supports and loss of elastic recoil of airway leading to premature expiratory airway closure and alveoli hyperinflation. The functional residual volume (FRV) is increased and produces the barrel chest deformity often seen in COPD.
### Table 15-3
Pulmonary Diagnostic Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Purpose</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chest x-ray</strong></td>
<td>• Evaluate the status of the chest and intrathoracic structures.</td>
<td>• Inform radiology department if female patient of child-bearing age is pregnant.</td>
</tr>
<tr>
<td></td>
<td>• Diagnose many pathologic changes.</td>
<td>Special precautions/shielding will be needed for pregnant women.</td>
</tr>
<tr>
<td></td>
<td>• Includes posterior-anterior (PA) and lateral (L) views.</td>
<td>• No special dietary or blood analysis is needed.</td>
</tr>
<tr>
<td></td>
<td>• Portable chest x-ray includes only the PA view and is done at the bedside when the patient is</td>
<td>• Assist in positioning the patient if a portable view is being taken.</td>
</tr>
<tr>
<td></td>
<td>not stable or to verify the placement of invasive lines.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Typical abnormal findings and their significance:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Vascular congestion/alveoli edema: CHF or pulmonary edema.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Atelectasis: the patient needs to do more rigorous pulmonary toileting.</td>
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<tr>
<td></td>
<td>- Mass or nodule: benign or cancerous lesion.</td>
<td></td>
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<tr>
<td></td>
<td>- Pneumothorax: will state if small, moderate or large amount of air indicative of a pneumothorax.</td>
<td></td>
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<tr>
<td></td>
<td>- Infiltrate/consolidation: pneumonia.</td>
<td></td>
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<tr>
<td></td>
<td>- Airway space disease: COPD, asthma.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cavitous appearance: pulmonary tuberculosis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inform radiology department if female patient of child-bearing age is pregnant.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Assess pregnancy status if female of child-bearing age.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Special precautions/shielding will be needed for pregnant women.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No special dietary or blood analysis is needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Assist in positioning the patient if a portable view is being taken.</td>
<td></td>
</tr>
<tr>
<td><strong>Sinus x-ray</strong></td>
<td>• Assess fluid levels in sinuses to assist in diagnosis of sinusitis.</td>
<td></td>
</tr>
<tr>
<td><strong>Computerized tomography (CT scan)</strong></td>
<td>• Much more sensitive than chest x-ray in providing anatomic detail and defining tissue densities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A spiral scan with IV contrast infusion is useful in diagnosing vascular abnormalities such as pulmonary embolus.</td>
<td></td>
</tr>
<tr>
<td><strong>Magnetic resonance imaging (MRI)</strong></td>
<td>• Scanner generates a weak magnetic pulse to produce images of extremely high contrast.</td>
<td>• Assess patient for metallic implants or devices that would preclude use of strong magnetic field.</td>
</tr>
<tr>
<td></td>
<td>• Rare applications in which MRI is superior to CT scanning for delineating pulmonary problems.</td>
<td>• Instruct patient on the nature and length of the scan and environment in the machine.</td>
</tr>
<tr>
<td><strong>Positron emission tomography (PET)</strong></td>
<td>• Identify lung nodules (cancer).</td>
<td>• No alcohol, coffee, or tobacco is allowed for 24 hours prior to the test.</td>
</tr>
<tr>
<td></td>
<td>• Radiation from a PET scan is less than what is received during a CT scan.</td>
<td>• Encourage fluids post test to help eliminate the radioactive material.</td>
</tr>
<tr>
<td><strong>Function Studies</strong></td>
<td>• Identify three general patterns of abnormality: (1) Obstructive: narrow airways increasing resistance to airflow, especially on exhalation; (2) Restrictive: lung expansion is compromised; and (3) Mixed: presence of both obstructive and restrictive.</td>
<td>• Document patient height and weight.</td>
</tr>
<tr>
<td></td>
<td>• Forced vital capacity (FVC): amount of air that can be forcibly expelled from a maximally flat lung.</td>
<td>• Instruct patient on importance of giving best effort to ensure reliable results. Some measurements are very dependent upon patient effort.</td>
</tr>
<tr>
<td></td>
<td>• Forced expiratory volume in 1 second (FEV1): amount of air expelled in first second.</td>
<td>• Patient is to avoid smoking or use of bronchodilators for 6 hours before testing.</td>
</tr>
<tr>
<td></td>
<td>• Maximal volume ventilation (MVV): maximal volume of air that a patient can breathe in and out during 1 minute.</td>
<td>• Evaluate patient's stamina, strength, ability to follow directions. All are required for reliable testing.</td>
</tr>
<tr>
<td></td>
<td>• Tidal volume (TV): volume of air inspired and expired with normal breath.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inspiratory reserve volume (IRV): maximal volume of air that can be inspired from the end of a normal inspiration.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Expiratory reserve volume (ERV): maximal volume of air that can be exhaled from the end of a normal expiration.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inspiratory capacity (IC): maximal amount of air that can be inspired after normal expiration.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Functional residual volume (FRV): amount of air left in lungs after a normal expiration.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Vital capacity (VC): maximal amount of air that can be expired after maximal inspiration.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Total lung capacity (TLC): TV + IRV + ERV + RV.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Minute volume (MV): volume of air inhaled and exhaled in 1 minute.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dead space: part of the tidal volume that does not participate in gas exchange.</td>
<td></td>
</tr>
</tbody>
</table>
I. Definition of Terms

A. Helping role: nursing activities responsive to the uniqueness of the patient and family, creating a climate for and a commitment to healing.

B. Teaching-coaching function: ability to learn from and to teach others.

C. Diagnostic and monitoring function: detection and documentation of significant changes in patient condition.

D. Effective management of rapidly changing situations: acting efficiently and rapidly responding to significant and life-threatening changes in patient situations, including specific patient management and while orchestrating the interdisciplinary team.

E. Administering and monitoring therapeutic interventions and regimens: skill in administering complex and intricate therapeutic interventions and patient regimens.

F. Monitoring and ensuring quality health care practices: skill in patient advocacy and error prevention.

G. Organizational and work-role competencies: skills of organizing and setting priorities, creating an effective care team, and responding to staffing changes.

II. Description of Domains of Nursing Practice at the Competent Level

A. Helping role.

1. The healing relationship.
   a. The nurse must establish a climate for and a commitment to healing. To accomplish this, the nurse needs to understand his/her own personal values and how they can affect interactions, relationships, and boundaries with patients.
   b. The nurse is familiar with and considerate of patients’ rights and imparts trust to patients and families, competently advocating for them. Consequently, the nurse is trusted by patients and families to handle situations that may be threatening, whether actual or perceived.
   c. The nurse maintains an environment in which patient confidentiality is assured. The competent nurse recognizes and incorporates diversity in the provision of patient care (e.g., ethnicity, gender, disability, spirituality, socioeconomic/education level) and successfully integrates experience, technical skills, and an ability to individually deal with patients, families, and others.

2. Providing comfort measures and preserving personhood in the face of pain and extreme distress.
   a. The nurse must recognize that, although there may be little that can be done by the health care team to prolong the life of a patient, there are often ways to maintain or enhance the quality of life during a patient’s last days in the hospital.
   b. As the time to discontinue life-saving measures approaches, it is important that the nurse does not avoid the patient and still finds ways to provide comfort to the patient and family. The nurse accomplishes this by demonstrating empathy in interactions with the patient and family, acknowledging, respecting, and supporting their emotional state as they experience and/or express their emotions.
   c. The nurse demonstrates cultural sensitivity and uses age-specific instruments to assess the patient’s level of comfort (e.g., pain, fatigue, nausea, dyspnea, anxiety, depression, dementia, etc.).
   d. The nurse involves the patient and/or family in planning and implementing care.
   e. The nurse provides comfort and a sense of control to the patient and family by modifying plans of care, as appropriate (e.g., pharmacologic interventions, heat, cold, massage, positioning, touch, etc.).
   f. The nurse recognizes the value of using a multidisciplinary approach to achieve an optimal level of comfort for patients.
   g. The nurse provides a sense of empowerment to the patient and family by acknowledging, respecting, supporting, and facilitating their decisions related to end of life.

3. Presencing.
   a. The nurse recognizes the importance of being with a patient and maximizing the patient’s participation and control in the process of recovery.
   b. This is demonstrated by remaining in close proximity to patients, involving them in planning and implementing their care, allowing them to identify new options, and advocating on their behalf.

4. Interpreting kinds of pain and selecting appropriate strategies for pain management and control.