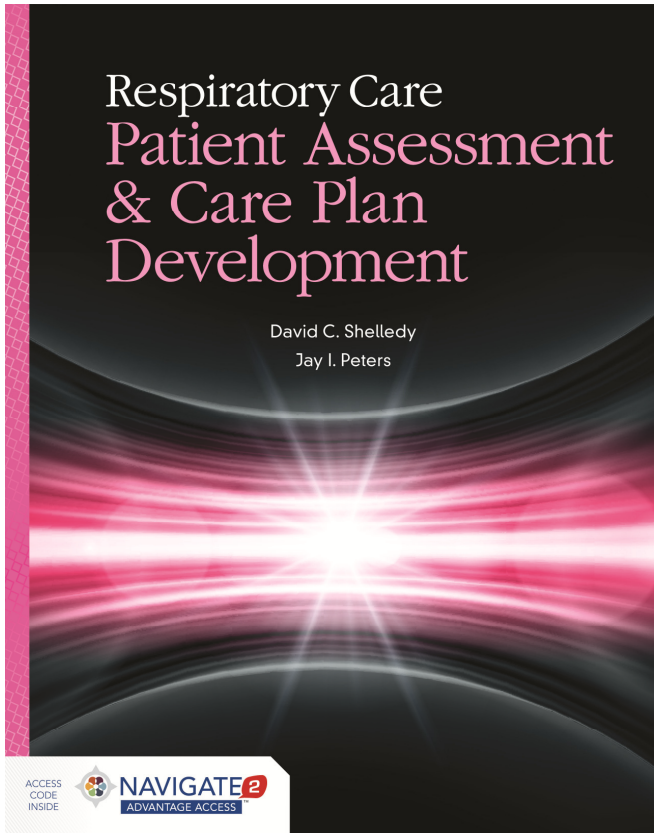
Thank you for joining us today to learn more about the new text:

Respiratory Care: *Patient Assessment and Care Plan Development*



Respiratory Care: Patient Assessment and Care Plan Development

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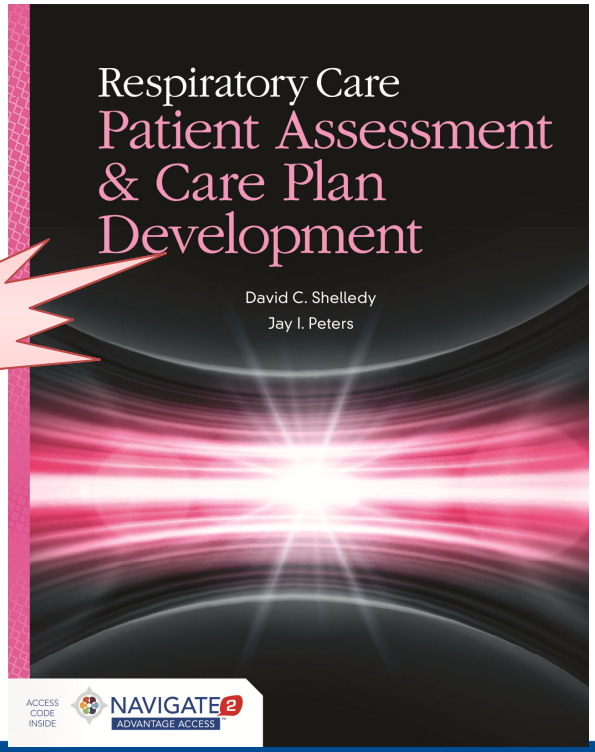

Includes Navigate 2!

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Instructors Praise This Approach

"This text provides foundational information needed to develop Respiratory Therapists that are able to function as critical thinkers. A new student should be able to read the information provided here and participate in thorough patient information gathering. The text utilizes case studies at varying points throughout the reading to help the student determine if they are understanding and able to pick out key identifiers related to patient assessment. The stepwise approach is pertinent to today's respiratory therapist workforce."

--Rebecca A. Higdon, MS, RRT, Director of Clinical Education, Elizabethtown Community & Technical College

"[Respiratory Care: Patient Assessment and Care Plan Development] is well organized and the use of research and literature review within the text is a good method of introducing its use while also covering content. The various areas to consider in care planning were detailed very well while also including diagnostics and pathology which are crucial for critical thinking and assessment.

I love the additional materials on research and the case studies. The use of literature review results, tables of information throughout, and case studies were well developed. Very well done."

~ M. Marcia Fuller, MAE, RRT, Professor and Program Director of Respiratory Care, Bowling Green Technical College

"Much more in-depth than any other books I have read on Care Plan development."

--Cynthia McKinley BAAS, RRT, Assistant Professor, Director of Clinical Education, Lamar Institute of Technology

Overview

- A comprehensive guide to the evaluation of the patient, and the development and implementation of an appropriate, evidence-based, respiratory care plan
- Describes the purpose of patient assessment and then guides the reader through the process of the reviewing existing data in the medical record, conducting the patient interview, performing the physical assessment, evaluating the diagnostic studies needed and then developing and implementing a respiratory care plan
- Bridging the gap between patient assessment and treatment, the reader will learn how to apply assessment skills to the development and implementation of evidence-based respiratory care plans
- Critical diagnostic thinking is reviewed and then applied to specific patient situations

Pedagogical Elements

- Chapter Objectives
- Chapter Outlines
- Key Terms
- Hundreds of full-color Illustrations, Photos & Tables
- Boxed Articles and Notes
- Clinical Practice Guidelines

CHAPTER

2

Development and Implementation of Respiratory Care Plans

David C. Shelledy and Jay I. Peters

CHAPTER OUTLINE

Introduction to Respiratory Care Plans
Common Conditions Requiring Care Plan Development
Respiratory Care Plan Development
Maintain Adequate Tissue Oxygenation
Treat and/or Prevent Bronchospasm and Mucosal Edema
Mobilize and Remove Secretions
Provide Lung Expansion Therapy
Critical Care and Mechanical Ventilation
Diagnostic Testing
Respiratory Care Plan Format

CHAPTER OBJECTIVES

1. Describe the purpose of a respiratory care plan.
2. Identify the key elements of a respiratory care plan.
3. Describe common conditions that may require development of a respiratory care plan.
4. Define *respiratory failure*, and give examples of several types of respiratory failure.
5. Define *ventilatory failure*, and contrast acute ventilatory failure and chronic ventilatory failure.
6. Give examples of appropriate outcome measures for a respiratory care plan.
7. Outline the key steps in the development and implementation of a respiratory care plan.
8. Develop a respiratory care plan to maintain adequate tissue oxygenation.
9. Create a respiratory care plan for the treatment and/or prevention of bronchospasm and mucosal edema.
10. Describe the care of patients with asthma and COPD.
11. Design a respiratory care plan to mobilize secretions.
12. Propose a respiratory care plan for the treatment and/or prevention of atelectasis and pneumonia.
13. Give examples of types of respiratory care plans used in the intensive care unit.
14. Explain the role of diagnostic testing in the development of a respiratory care plan.

KEY TERMS

acute lung injury (ALI)
acute respiratory distress syndrome (ARDS)
acute respiratory failure
acute ventilatory failure (AVF)
anti-inflammatory agents
antiasthmatic medications
asthma
atelectasis
bronchial hygiene
bronchiectasis
bronchodilator therapy
bronchospasm
chest physiotherapy (CPT)
chronic bronchitis
chronic ventilatory failure (CVF)
chronic obstructive pulmonary disease (COPD)
history
hypoxemia
incentive spirometry (IS)
intermittent positive pressure breathing (IPPB)
lung expansion therapy
mechanical ventilation
mucosal edema
oxygen therapy
physical
pneumonia
positive airway pressure (PAP)
protocol
pulmonary edema
respiratory care plan
retained secretions
SOAP notes
treatment menu

Overview

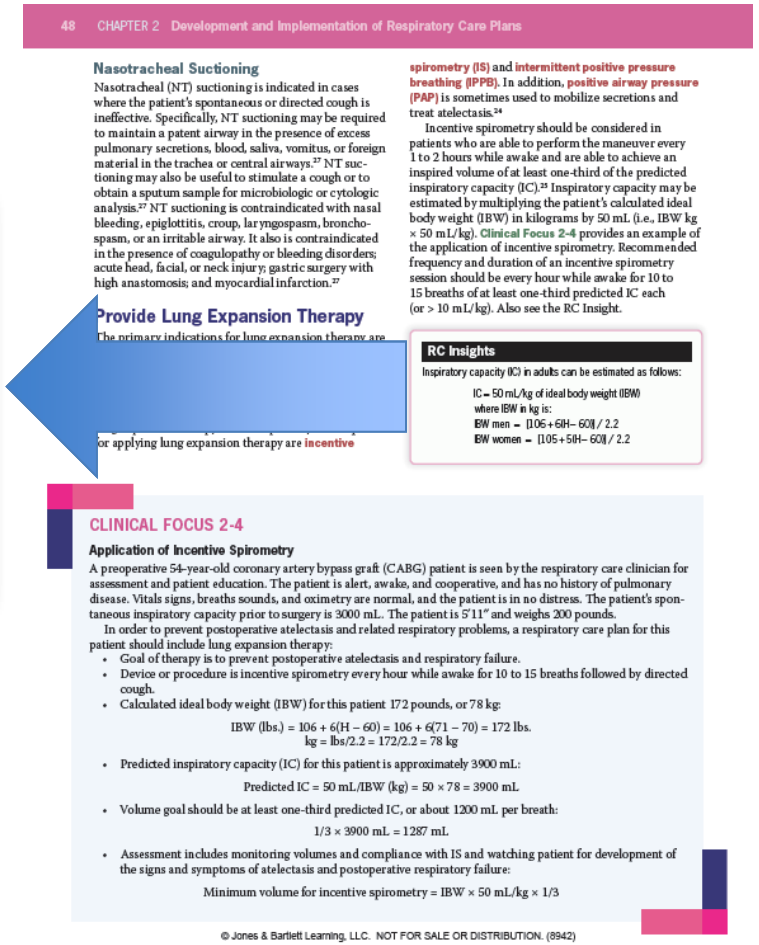
This chapter provides a guide to the development, implementation, and evaluation of respiratory care plans. In order to develop an appropriate respiratory care plan, the clinician must first perform a thorough patient assessment, including a review of the patient's existing medical record, a patient interview, and a physical assessment. The bedside measurement of clinical parameters related to oxygenation, ventilation, and pulmonary function may be performed. Pulse oximetry (Spo_2) is often used to assess oxygenation status. Arterial blood gases should be obtained if there is concern

RC Insights

RC Insights

Inspiratory capacity (IC) in adults can be estimated as follows:

IC = 50 mL/kg of ideal body weight (IBW)
where IBW in kg is:
IBW men = [106 + 6(H – 60)] / 2.2
IBW women = [105 + 5(H – 60)] / 2.2



48 CHAPTER 2 Development and Implementation of Respiratory Care Plans

Nasotracheal Suctioning

Nasotracheal (NT) suctioning is indicated in cases where the patient's spontaneous or directed cough is ineffective. Specifically, NT suctioning may be required to maintain a patent airway in the presence of excess pulmonary secretions, blood, saliva, vomitus, or foreign material in the trachea or central airways.[27] NT suctioning may also be useful to stimulate a cough or to obtain a sputum sample for microbiologic or cytologic analysis.[27] NT suctioning is contraindicated with nasal bleeding, epiglottitis, croup, laryngospasm, bronchospasm, or an irritable airway. It also is contraindicated in the presence of coagulopathy or bleeding disorders; acute head, facial, or neck injury; gastric surgery with high anastomosis; and myocardial infarction.[27]

Provide Lung Expansion Therapy

The primary indications for lung expansion therapy are

or applying lung expansion therapy are **incentive spirometry (IS)** and **intermittent positive pressure breathing (IPPB)**. In addition, **positive airway pressure (PAP)** is sometimes used to mobilize secretions and treat atelectasis.[24]

Incentive spirometry should be considered in patients who are able to perform the maneuver every 1 to 2 hours while awake and are able to achieve an inspired volume of at least one-third of the predicted inspiratory capacity (IC).[25] Inspiratory capacity may be estimated by multiplying the patient's calculated ideal body weight (IBW) in kilograms by 50 mL (i.e., IBW kg × 50 mL/kg). **Clinical Focus 2-4** provides an example of the application of incentive spirometry. Recommended frequency and duration of an incentive spirometry session should be every hour while awake for 10 to 15 breaths of at least one-third predicted IC each (or > 10 mL/kg). Also see the RC Insight.

RC Insights

Inspiratory capacity (IC) in adults can be estimated as follows:

IC = 50 mL/kg of ideal body weight (IBW)
where IBW in kg is:
IBW men = [106 + 6(H – 60)] / 2.2
IBW women = [105 + 5(H – 60)] / 2.2

CLINICAL FOCUS 2-4

Application of Incentive Spirometry

A preoperative 54-year-old coronary artery bypass graft (CABG) patient is seen by the respiratory care clinician for assessment and patient education. The patient is alert, awake, and cooperative, and has no history of pulmonary disease. Vitals signs, breaths sounds, and oximetry are normal, and the patient is in no distress. The patient's spontaneous inspiratory capacity prior to surgery is 3000 mL. The patient is 5'11" and weighs 200 pounds.

In order to prevent postoperative atelectasis and related respiratory problems, a respiratory care plan for this patient should include lung expansion therapy:

- Goal of therapy is to prevent postoperative atelectasis and respiratory failure.
- Device or procedure is incentive spirometry every hour while awake for 10 to 15 breaths followed by directed cough.
- Calculated ideal body weight (IBW) for this patient 172 pounds, or 78 kg:

  IBW (lbs.) = 106 + 6(H – 60) = 106 + 6(71 – 70) = 172 lbs.
  kg = lbs/2.2 = 172/2.2 = 78 kg
- Predicted inspiratory capacity (IC) for this patient is approximately 3900 mL:

  Predicted IC = 50 mL/IBW (kg) = 50 × 78 = 3900 mL
- Volume goal should be at least one-third predicted IC, or about 1200 mL per breath:

  1/3 × 3900 mL = 1287 mL
- Assessment includes monitoring volumes and compliance with IS and watching patient for development of the signs and symptoms of atelectasis and postoperative respiratory failure:

  Minimum volume for incentive spirometry = IBW × 50 mL/kg × 1/3

Clinical Focus

CLINICAL FOCUS 2-4

Application of Incentive Spirometry

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$$1/3 \times 3900 \text{ mL} = 1287 \text{ mL}$$

- Assessment includes monitoring volumes and compliance with IS and watching patient for development of the signs and symptoms of atelectasis and postoperative respiratory failure:

$$\text{Minimum volume for incentive spirometry} = \text{IBW} \times 50 \text{ mL/kg} \times 1/3$$

Chapter Summary and Key Points

Summary

The respiratory care plan is simply a written explanation of the respiratory care that the patient is to receive. The respiratory care plan may take the form of physician's orders, a detailed progress note in the medical record, an established protocol, completion of a standardized respiratory care plan form, or the use of problem-oriented medical records using SOAP notes. In the clinical setting, respiratory care plan development requires an initial physician's order, a well-designed protocol or policy, and careful patient assessment. The physician's order may be specific, or it may simply state "respiratory care per protocol."

Developing and implementing the respiratory care plan requires a careful patient assessment. Following the patient assessment, the respiratory care clinician selects the appropriate care based on the patient's condition and the indications for each type of therapy. The respiratory care plan may include the goals of therapy, the device or procedure that will be used, medications given, method or appliance used, gas source and/or flow, volume goals, frequency of therapy, and duration of therapy. The care plan may also include a statement of how the intensity and/or duration of therapy will be adjusted and when the therapy will be discontinued. Assessment of the outcomes of therapy may also be included. These may include evidence of clinical improvement, measurement of bedside pulmonary function data such as PEF or FEV_1, improvement in oxygenation or Spo_2, improved quality of life, patient subjective improvement, and the absence of adverse side effects.

In summary, the respiratory care plan is the written plan of treatment that the patient will receive. The respiratory care plan may include goals, rationale, and significance and a description of how care will be assessed.

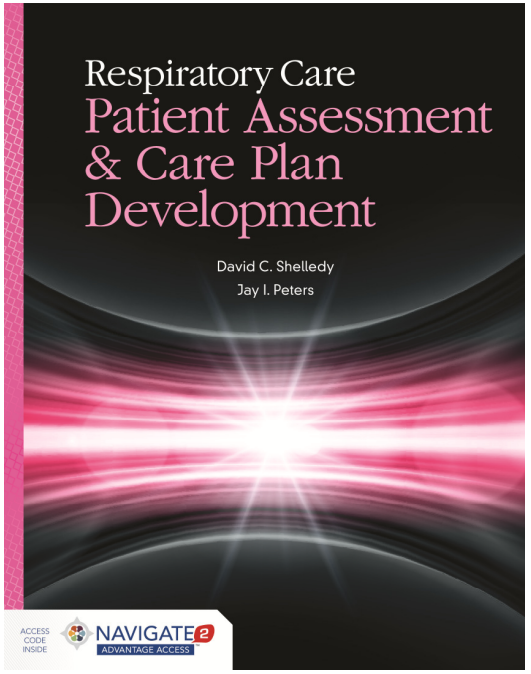
Key Points

- The respiratory care plan provides a written description of the care the patient is to receive.
- Respiratory care plans include the goals of therapy, the device or procedure to be used, medications to be given, frequency of administration, and duration of therapy.
- SOAP refers to **S**ubjective, **O**bjective, **A**ssessment, and **P**lan.
- Acute respiratory failure (ARF) is defined as a sudden decrease in arterial oxygen levels with or without carbon dioxide retention.
- Acute ventilatory failure (AVF) is defined as a sudden rise $PaCO_2$ with a corresponding decrease in pH.
- Chronic ventilatory failure is defined as a chronically elevated $PaCO_2$ with a normal (compensated) or near-normal pH.

Goals

- This book was created to provide students and clinicians concerned with the assessment and care patients with cardiopulmonary disorders a comprehensive guide to patient assessment with an emphasis on:
  - Patient evaluation
  - Implementation of appropriate, evidence–based respiratory care plans
- The focus is on the assessment, diagnostic evaluation, treatment, and care of patients
- The primary audience is the respiratory therapist with the goal of providing the knowledge and skills needed for advanced practice
- We believe the information contained will be of great value to those who prescribe respiratory care and for all healthcare practitioners interested in optimizing outcomes for patients with heart and lung disease
- Content needed to pass the NBRC exams is included

Table of Contents



Content

- The book has a natural flow:
  - It begins by describing the purpose of patient assessment (Chapter 1) and methods associated with evidence-based practice.
    - Introduction to patient assessment
    - Why it is so important
    - Factors that affect health
    - Drivers of the health care system (cost, access and quality and the triple aim of health care reform)
    - Evidence-based practice
    - Sources and types of evidence
    - Questions for evidence-based practice (how to do it)
    - Recommendations for therapy
  - Critical diagnostic thinking is then reviewed
    - Steps to establish a diagnosis
    - Common (and less common) assessment findings
    - Typical presentations of common respiratory disorders

Table 1-1
Factors That Determine Individual Health

- **Genetic makeup**
- **Natural physical environment** (climate, housing, neighborhood, work, school)
  - Housing factors that may affect health
    - Lead exposures
    - Mold, mites, and other allergens
    - Temperature extremes
    - Indoor air pollution
    - Injuries
    - Residential crowding
  - Neighborhood conditions that may affect health
    - Physical conditions
    - Substandard housing
    - Poor air/water quality, exposure to hazardous substances
    - Crime and safety, safe places to exercise
    - Employment opportunities
    - Access to full-service grocery stores (presence of food deserts)
    - Schools, transportation and other municipal services
    - Social networks and social support
  - Work
    - Exposure to hazardous materials
    - Physical activity
    - Pay, promotions, social support, job satisfaction, stress
    - Access to medical care
  - School
    - Physical activity and nutrition
    - Environment
    - Access to medical care
  - Environmental stress (work, home, other) impacts other health factors, such as
    - Alcohol and drug abuse
    - Mental health
    - Eating habits and obesity
    - Blood pressure and immune response
- **Healthcare services**
  - Quality, access, and cost
  - Acute care
  - Preventative care
  - Rehabilitation
  - Chronic disease management
- **Health-related behaviors**
  - Nutrition
  - Smoking
  - Drugs and alcohol
  - Physical exercise

Adapted with permission from Center on Social Disparities in Health, University of California, San Francisco.

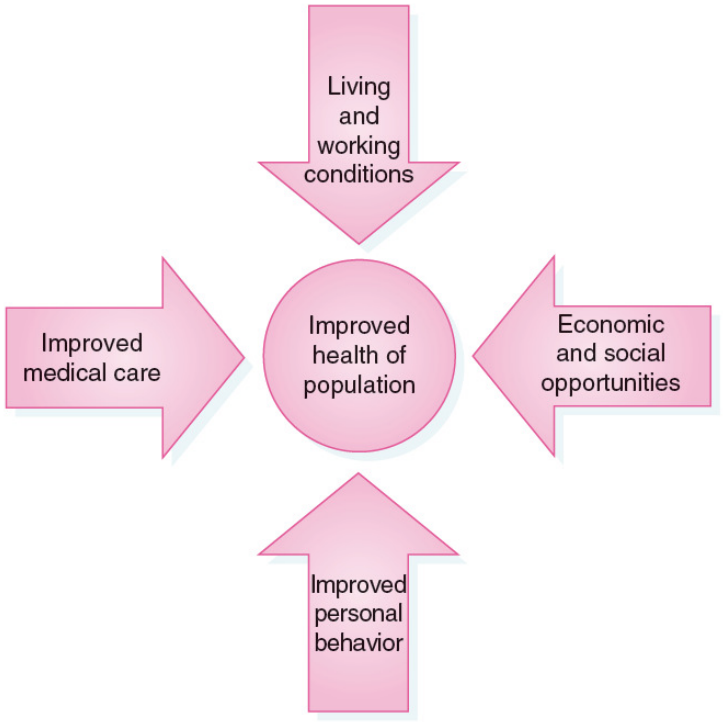


FIGURE 1-2 **Conceptual framework for addressing healthcare disparities.**

BOX 1-3

Use of Questions in Evidence-Based Practice

1. Patient problem or population
   - *What patient or problem is being considered?*
     - What is the patient's chief complaint or primary problem? Respiratory examples may include a patient's symptoms or primary disease state or condition:
       - Symptoms: Cough, sputum production, shortness of breath, wheezing, chest tightness, chest pain, other?
       - Disease states or conditions: Asthma "attack," COPD exacerbation, acute respiratory failure, chest trauma, other?
     - What is the larger patient population under consideration?
       - Asthma, COPD, pneumonia, acute lung injury, respiratory failure, ARDS, congestive heart failure (CHF), other?
2. Intervention
   - *What diagnostic method, treatment, medication, procedure or other intervention is being considered?*
     - The intervention is what you plan to do for the patient. Examples might include:
       - Diagnostic procedures (blood gases, pulmonary function testing, laboratory studies, imaging studies, other)
       - Drugs or medications (antimicrobial agents, bronchodilators, anti-inflammatory agents, cardiac drugs, other)
       - Respiratory care procedures (oxygen therapy, directed cough, lung expansion therapy, bronchial hygiene techniques, other)
       - Mechanical ventilatory support (invasive or noninvasive)

3. Comparison
   - *What alternative treatments or interventions are being considered?*
     - Examples of comparisons for respiratory care might include:
       - Pulmonary rehabilitation versus home care in COPD
       - Peak flow versus symptom monitoring in moderate to severe asthma
       - Volume-control versus pressure-control modes of mechanical ventilation in ARDS
       - Rapid drug-susceptibility tests versus conventional culture-based methods for detection of multidrug-resistant tuberculosis
     - In some cases, there may not be an alternative treatment or therapy under consideration.
4. Outcome
   - *What outcomes are sought?*
     - Diagnosing a condition
     - Relieving or eliminating specific symptoms
     - Stopping or reversing a pathologic process
     - Improving or maintaining function
     - Prevention
5. Searching the literature
   - *The next step is to define the search terms and perform a literature review:*
     - Search terms should include the problem, intervention, and comparison (if there is to be a comparison).
     - Examples might include:
       - Noninvasive ventilation and COPD
       - Drug treatment and ARDS
       - Medications and acute asthma exacerbation
       - Antibiotics and ventilator acquired pneumonia
       - Weaning method(s) and mechanical ventilation in ARDS patients

BOX 1-2

Online Resources for Evidence-Based Practice

- **PubMed.** PubMed is a comprehensive online database of peer-reviewed biomedical research papers, reviews, and journal articles (http://www.ncbi.nlm.nih.gov/pubmed/).
- **Medline.** Similar to PubMed, Medline is a comprehensive online database of peer-reviewed biomedical research papers, reviews, and journal articles. It is available through college and university library services via OVIDSP.
- **CINAHL (Cumulative Index to Nursing and Allied Health Literature).** CINAHL is a comprehensive online database of nursing and allied health journal publications. It may include articles not listed in other databases. CINAHL is available through college and university library services via EBSCO Publishing (http://www.ebscohost.com/cinahl/).
- **Google Scholar.** Google Scholar provides an effective search engine which includes an "Advanced Scholar Search" option. When used properly, recall and precision of Google Scholar is similar to PubMed. (http://scholar.google.com)
- **Cochrane Database of Systematic Reviews.** The Cochrane Collaboration (http://www.cochrane.org) and the Cochrane Library (http://www.thecochranelibrary.com/view/0/index.html) provide systematic reviews of the literature for use in evidence-based practice.
- **MD Consult.** This comprehensive medical information service for evidence-based practice is available through college and university library subscription services (http://www.mdconsult.com).
- **UpToDate.** This comprehensive medical information service for evidence-based practice is available through college and university library subscription services (http://www.uptodate.com/index).
- **Centers for Disease Control and Prevention (CDC).** The CDC offers a wealth of tools and resources on its website (http://cdc.gov).
- **National Institutes of Health (NIH).** The NIH is a valuable source of information on evidence-based medicine (http://www.nih.gov).

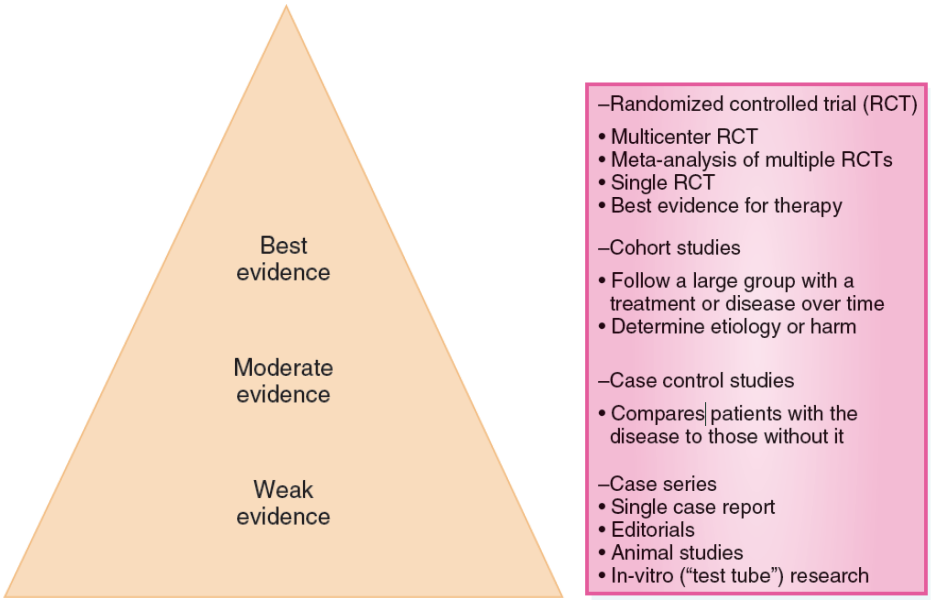


Table 1-3
Rating the Evidence for Recommendations of Therapy

A number of rating systems have been developed to assess the strength of the evidence for evidence-based practice. The following system evaluates the strength of the recommendation and the quality of the evidence:

Strength of the Recommendation		
Level	*Strength*	*Description*
1	Stronger	Benefits clearly outweigh the risks and burdens (or vice versa) for nearly all patients.
2	Weaker	Risks and benefits are more closely balanced or are more uncertain
Quality of the Evidence		
Grade	*Quality*	*Description*
A	High	Well-performed randomized controlled trials or overwhelming evidence of some other sort. Further research is very unlikely to change our confidence in the estimate of the effect.
B	Moderate	Randomized controlled trials that are less consistent, have flaws, or are indirect in some way to the issue being graded, or very strong evidence of some other sort. Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
C	Low	Low observational evidence (from observational studies, case series, or clinical experience), or evidence from controlled trials with serious flaws. Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
D	Very Low	Any estimate of effect is uncertain

From: Restrepo, RD. AARC Clinical Practice Guideline: From "Reference-Based" to "Evidence-Based." *Respiratory Care*; June 2010 55(6).

FIGURE 1-3 Evaluating the evidence (critical appraisal) → best evidence pyramid.

Critical Diagnostic Thinking

Approach to Hypothesis Formulation and Evaluation

Critical thinking to establish the patient's diagnosis should include the key elements of the scientific method.[23] These key elements or steps are:

1. Identify the problem.
2. Gather additional information to clarify the problem.
3. Formulate possible explanations (hypothesis formulation).
4. Test possible explanations (hypothesis testing).
5. Formulate and implement solutions.
6. Monitor and reevaluate.

Table 1-4
Common and Less Common Causes of Respiratory Care Assessment Findings

Problem	Common Causes	Less Common Causes
Acute cough	Viral upper respiratory infection (pharyngitis, rhinitis, tracheobronchitis, serous otitis) Bacterial infection (tracheobronchitis, acute bronchitis, mycoplasma, pneumonia, ear infection, sinusitis, abscess) Asthma Sinusitis Gastroesophageal reflux Congestive heart failure, pulmonary edema Inhalation of irritants (smog, smoke fumes, dusts, cold air) Bronchiolitis (RSV)	Tumor, neoplasm Pulmonary emboli Aspiration (foreign body, liquid) Laryngitis ACE inhibitor medication Pleural disease Diaphragm irritation Mediastinal disease Extrabronchial lesions Fungal lung disease Ornithosis
Chronic cough	Postnasal drip (sinusitis, allergic rhinitis) Smoking Asthma Chronic bronchitis Gastroesophageal reflux Congestive heart failure ACE inhibitor medication (20%) HIV Bronchiectasis Neoplasms, bronchogenic carcinoma Lung abscess Recurrent aspiration Aspiration (foreign body, liquid) Mycoplasma pneumonia Pulmonary tuberculosis Pulmonary fibrosis Cystic fibrosis	Chronic pulmonary edema Mitral stenosis Laryngeal inflammation or tumor Fungal pneumonia External or middle ear disease Bronchogenic cyst Mediastinal mass Zenker's diverticulum Aortic aneurysm Vagal irritation Pacemaker wires Pleural disease Pericardial, mediastinal, or diaphragm irritation Psychogenic cough

Content

- The book has a natural flow:
  - Critical diagnostic thinking is then applied to the development and implementation of evidence-based respiratory care plans (Chapter 2).
    - Introduction to care plans
    - Respiratory care plan development
    - Specific care plans
      - Maintain adequate tissue oxygenation
      - Treat and/or prevent bronchospasm
        - » Respiratory care plans for asthma
        - » Respiratory care plans for COPD
      - Mobilize and remove secretions
      - Provide lung expansion therapy
      - Critical care and mechanical ventilation
      - Diagnostic testing
    - Respiratory care plan format

Table 2-1
Types of Care Provided in the Respiratory Care Plan

Basic Respiratory Care
- Oxygen therapy
- Secretion management
- Sputum induction
- Management of bronchospasm and mucosal edema
- Lung expansion therapy

Critical Respiratory Care
- Invasive mechanical ventilatory support
- Noninvasive mechanical ventilatory support
- Physiologic monitoring
- Cardiac and hemodynamic monitoring
- Suctioning and airway care
- Airway intubation
- Advanced cardiovascular life support
- Metabolic studies
- Extracorporeal membrane oxygenation
- Mechanical circulatory assistance
- Basic care in the intensive care setting

Diagnostic Testing
- Oximetry
- Arterial blood gases
- Pulmonary function testing
- Cardiac testing (e.g., ECG, invasive cardiology, cardiac catherization laboratory)
- Ultrasound (echocardiography, other)
- Sleep studies
- Exercise testing

Special Procedures
- Transport
- Patient education
- Smoking cessation
- Disease management
- Pulmonary rehabilitation
- Cardiac rehabilitation

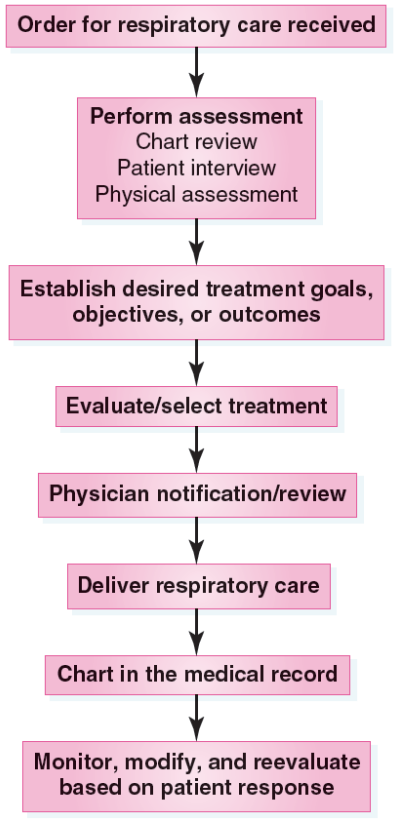


FIGURE 2-1 Steps in the development and implementation of the respiratory care plan.

Reviews

- Indications for therapies and diagnostic testing
- Treatment of common problems
  - Respiratory failure
    - Oxygenation problems
    - Ventilatory failure
  - Bronchospasm and mucosal edema
  - Asthma and COPD (includes medications – acute and chronic)
  - Secretion management
  - Lung expansion therapy
  - Critical care and mechanical ventilation

Content

- The book has a natural flow:
  - The book then guides the reader through the
    - Review of existing data in the medical record (Chapter 3)
    - Patient interview (Chapter 4)
    - Physical assessment of the patient (Chapter 5)
    - Ordering and evaluation of the diagnostic studies needed
  - Chapters 6 through 8 focus on the assessment of
    - Oxygenation, ventilation, and arterial blood gas sampling and interpretation (includes oximetry)
  - Chapter 9 reviews laboratory studies
    - Hematology, clinical chemistry, microbiology
    - Assessment of sputum, urinalysis, skin testing
    - Histology and cytology, and molecular diagnostics

Assessment Resources

BOX 4-4

Common Causes and Classification of Cough as Acute, Subacute, or Chronic

Acute cough: A cough that has been present for < 3 weeks.

- Acute respiratory tract infection
- Acute exacerbation of chronic lung disease
- Pneumonia
- Pulmonary embolus

Subacute cough: Cough has been present for 3 to 8 weeks.

- Postnasal drip
- Postinfectious cough
- Pertussis (whooping cough)

Chronic cough: Cough present > 8 weeks.

- Postnasal drip
- Asthma
- GERD
- ACE inhibitor medications
- Chronic bronchitis
- Bronchiectasis
- Lung cancer/neoplasm
- Foreign body aspiration
- Interstitial lung disease
- Lung abscess
- Nonasthmatic eosinophilic bronchitis
- Pertussis (whooping cough)
- Chronic idiopathic cough

TABLE 4-5
Patient Interview Questions Related to Phlegm, Sputum, or Mucus Production

The patient should be questioned using clear and direct language. A positive patient response should be followed by specific questions to provide more detail regarding onset, nature of the cough, pattern, frequency, associated symptoms, and related items.

1. Do you USUALLY bring up phlegm (sputum, mucus) from your chest first thing in the morning? ☐ Yes ☐ No
2. Do you USUALLY bring up phlegm (sputum, mucus) from your chest at other times during the day or night? ☐ Yes ☐ No
3. Do you bring up phlegm (sputum, mucus) from your chest on most days for as much as 3 months of the year? ☐ Yes ☐ No
4. (If yes to #3) For how many years have you raised phlegm (sputum, mucus) from your chest?
   _____ years
5. What is the USUAL color of the phlegm (sputum, mucus) you bring up from your chest?
   - Clear
   - Cream of off-white
   - White
   - Yellow
   - Green
   - Yellow/green
   - Rust
   - Pink
   - Red
   - Brown
   - Don't know
   - Other (give details):
     _____
6. How much sputum do you raise each day?
   - Less than a teaspoon
   - About a teaspoon full
   - About a tablespoon full
   - More than a tablespoon full
   - Don't know

BOX 4-5

Common Causes of Hemoptysis

Bronchitis (acute and chronic)
Bronchiectasis
Lung abscess
Tuberculosis
Pneumonia (includes necrotizing pneumonias
Neoplasms (bronchogenic carcinoma)
Pulmonary embolism (pulmonary infarction)
Cystic fibrosis

TABLE 4-7
Possible Causes of Wheezing

Upper Airway Obstruction: Extrathoracic

- Postnasal drip
- Croup and laryngotracheobronchitis
- Other laryngeal problems
  - Post extubation edema
  - Laryngeal stenosis
  - Vocal cord dysfunction
- Epiglottitis
- Anaphylaxis
- Retropharyngeal abscess
- Tumor

Upper Airway Obstruction: Intrathoracic

- Airway tumors
- Foreign body aspiration
- Tracheal stenosis
- Tracheal malacia

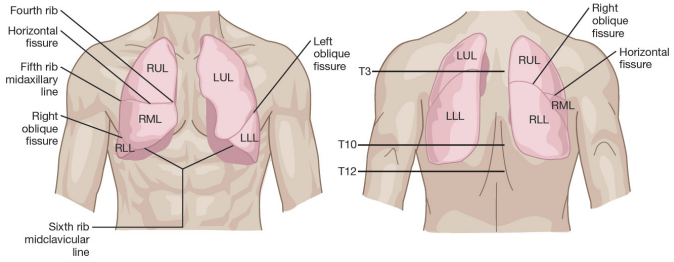
Lower Airway Obstruction

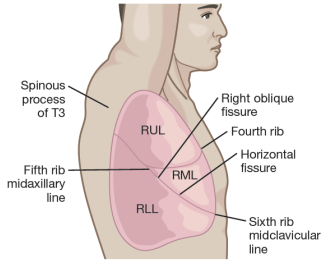
- Asthma
- Other chronic obstructive lung disease
  - COPD
  - Bronchiectasis
  - Cystic fibrosis
- Bronchiolitis
- Aspiration
  - Fluid aspiration, including gastric contents
  - Small foreign body aspiration
- Heart failure (cardiac asthma)
- Noncardiogenic pulmonary edema
- Pulmonary embolus
- Miscellaneous
  - Carcinoid syndrome
  - Lymphangitic carcinomatosis
  - Parasitic infections

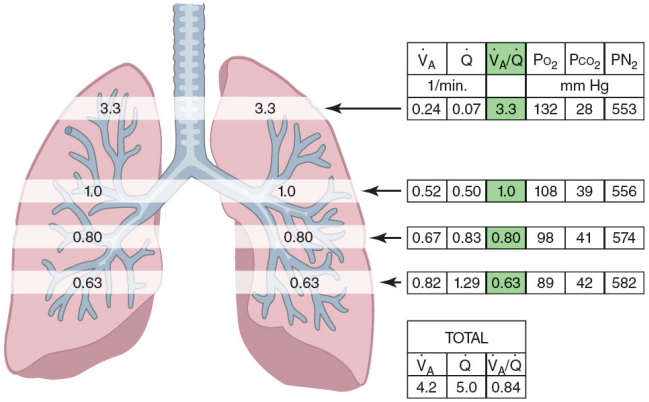
Chapters 4 and 5 Tables, Boxes and Figures

- Interview questions for cough
- Description of cough and sputum production
- Common causes of dyspnea
- Dyspnea rating scales (e.g. Borg, SOBQ, MMRC, VAS)
- Items to include in the patient history
- General history and history of chest illness questionnaires
- Medical history for asthma patients
- Smoking and tobacco use interview questions
- Effective smoking cessation techniques (5 As and 5Rs)
- Occupational lung disease
- Checklist for physical assessment for care plan development
- Steps in physical examination
- Vital signs
- Treatment of hypertension
- Fever
- Pain recognition
- BMI, obesity and health risks
- Mental status and neurologic exam (Glasgow, Ramsey sedation scale, Richmond agitation scale, Mini-Mental State Exam)
- Chest inspection summary
- Palpation techniques
- Percussion findings
- Clinical implications of breath sounds
- Chest pain
- Heart sounds
- Skin appearance and edema grades
- Physical findings of common respiratory disease

Images

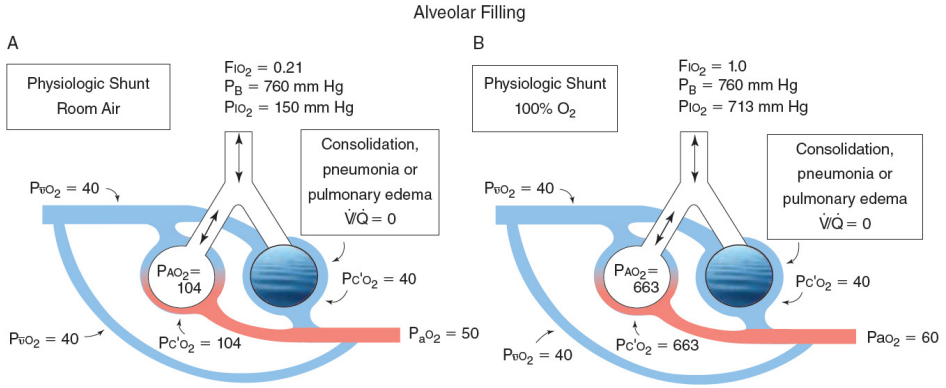






$\dot{V}_A$	$\dot{Q}$	$\dot{V}_A/\dot{Q}$	P_{O_2}	P_{CO_2}	P_{N_2}
1/min.			mm Hg		
0.24	0.07	3.3	132	28	553
0.52	0.50	1.0	108	39	556
0.67	0.83	0.80	98	41	574
0.82	1.29	0.63	89	42	582

TOTAL		
$\dot{V}_A$	$\dot{Q}$	$\dot{V}_A/\dot{Q}$
4.2	5.0	0.84



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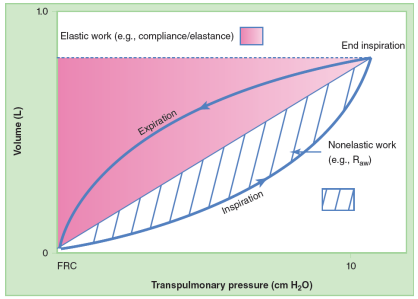
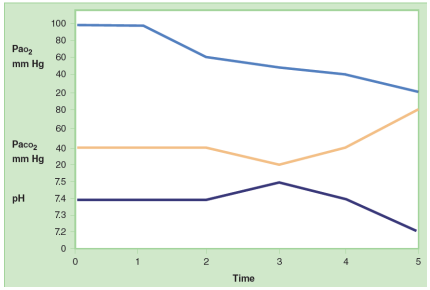
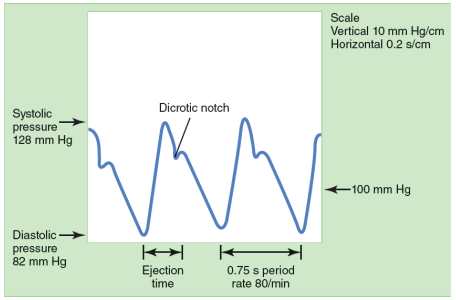
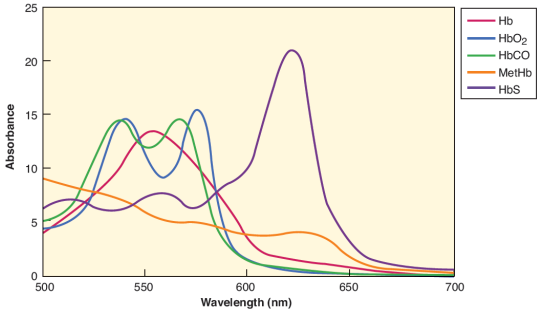








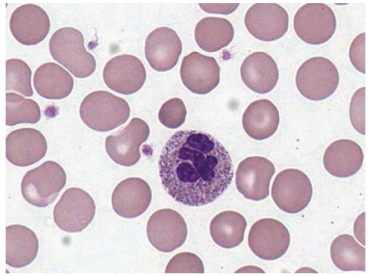


FIGURE 9-2 **Segmented neutrophil.**

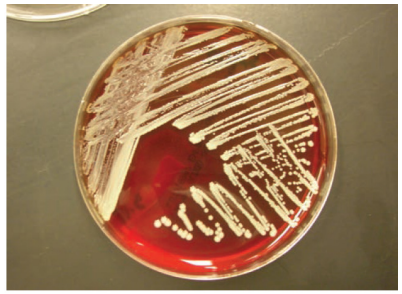
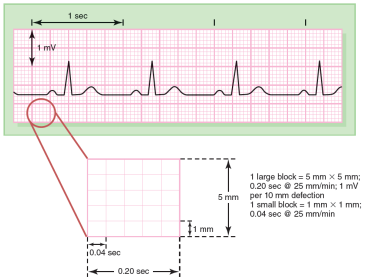


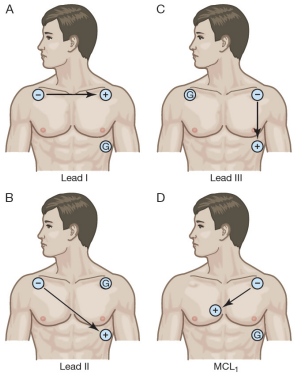
FIGURE 9-9 ***Staphylococcus aureus*** **colonies on Trypticase soy agar with 5% sheep RBCs (blood agar plate).**

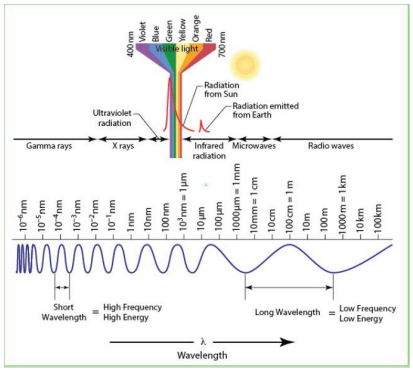
Content

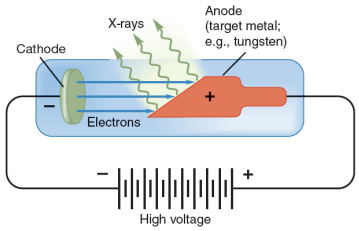
- The book has a natural flow:
  - In Chapter 10, ECG monitoring and interpretation are discussed to include findings with specific cardiac disorders
  - Chapter 11 focuses on imaging techniques to include the chest radiograph, CT scan, MRI, and other imaging studies used in the evaluation of the respiratory care patient and includes the evaluation of imaging findings associated with specific pulmonary diseases
  - Pulmonary function testing is described in Chapter 12 to include the evaluation of patients with obstructive and restrictive disease
  - Chapter 13 details diagnostic bronchoscopy and other diagnostic studies.
  - Acute and critical care monitoring with a focus on the patient receiving mechanical ventilatory support is covered in Chapter 14
  - Chapter 15 addresses the use of sleep studies in the evaluation of the cardiopulmonary patient
  - Last, but not least, Chapter 16 covers maternal and perinatal/neonatal patient assessment

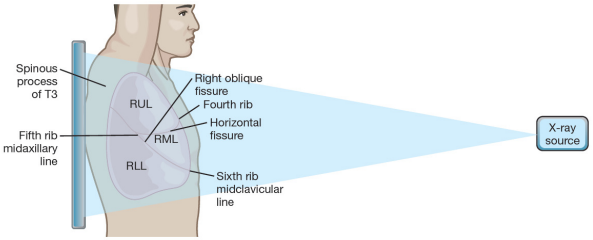
Images

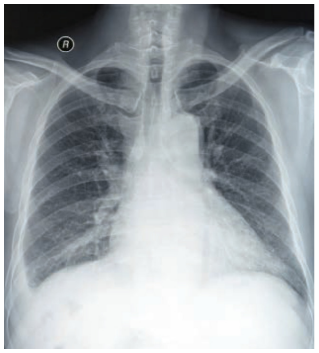


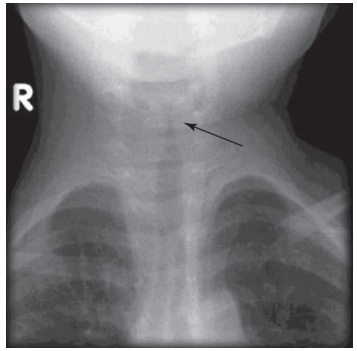












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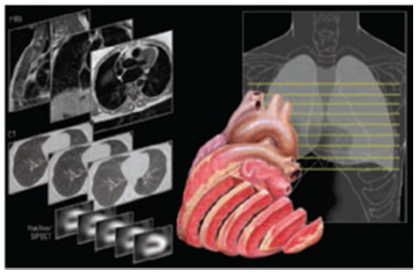

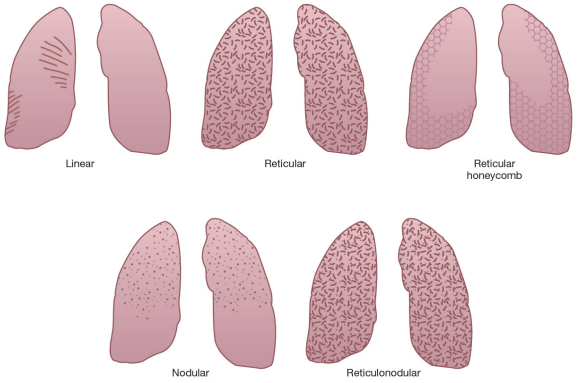

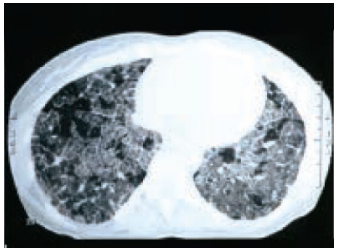

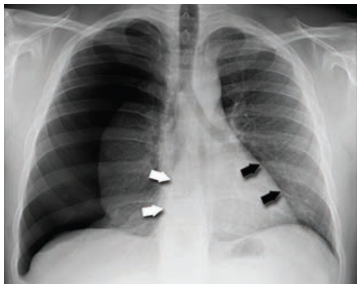

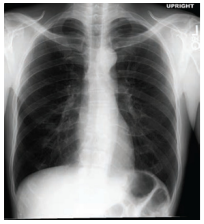

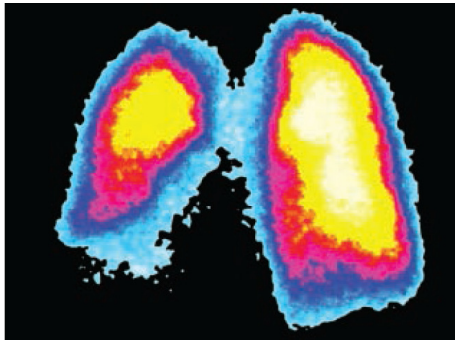

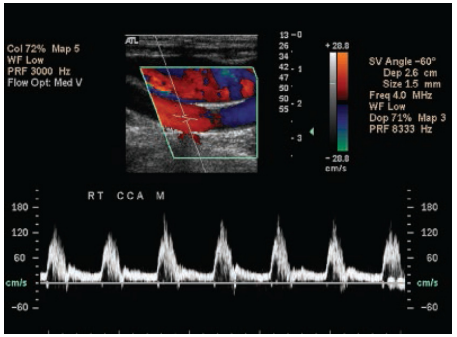

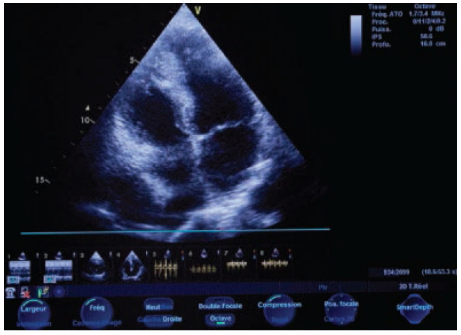

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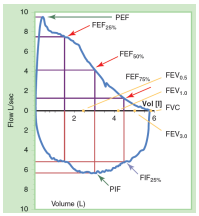

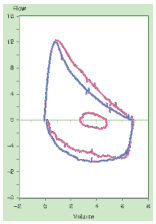

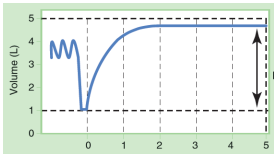

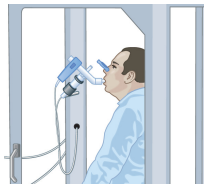

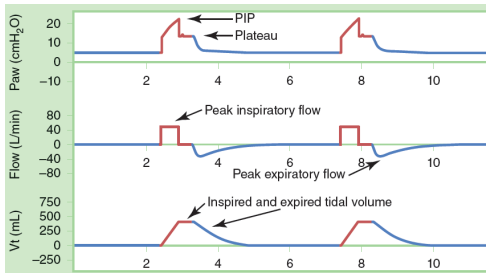

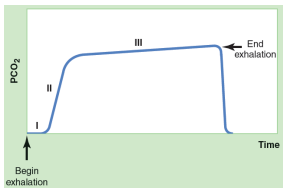

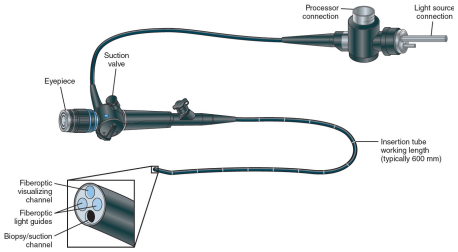

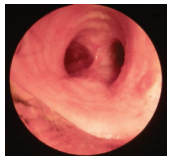

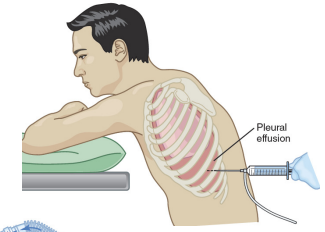

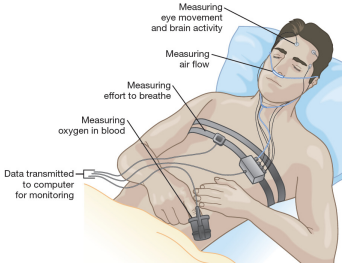

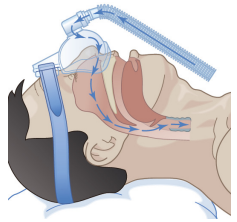

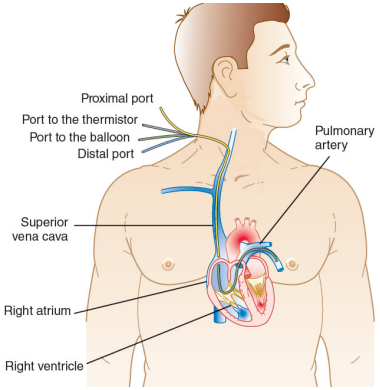

	Upper chest	Lower chest	Xiphoid retraction	Nares dilation	Expiratory grunt
Grade 0	Synchronized	No retraction	None	None	None
Grade 1	Lag on inspiration	Just visible	Just visible	Minimal	Stethoscope only
Grade 2	See-saw	Marked	Marked	Marked	Naked ear

FIGURE 16-3 **Silverman scoring system.**

Instructor Resources

- Lecture Outlines in PowerPoint Format
- Test Bank
- Sample Syllabus
- Image Bank

Instructor and Student Resources

Helpful Forms and Checklists available as printable PDFs

- Use of Questions in Evidence-Based Practice
- SOAP Format for Organizing a Respiratory Care Plan
- Detailed Respiratory Care Plan Format
- Mechanical Ventilation Flow Sheet
- Respiratory Care Assessment Medical Record Review Data Collection Form
- Form for General Past Medical History
- Patient Interview Questions Related to the Cough
- Patient Interview Questions Related to Phlegm, Sputum, or Mucus Production
- Patient Interview Questions Related to Hemoptysis
- History of Chest Illness
- Smoking and Tobacco Use Interview Questions
- Checklist for the Physical Assessment for Respiratory Care Plan Development
- Mini-Mental State Examination
- Assessment of Oxygenation

Student Resources

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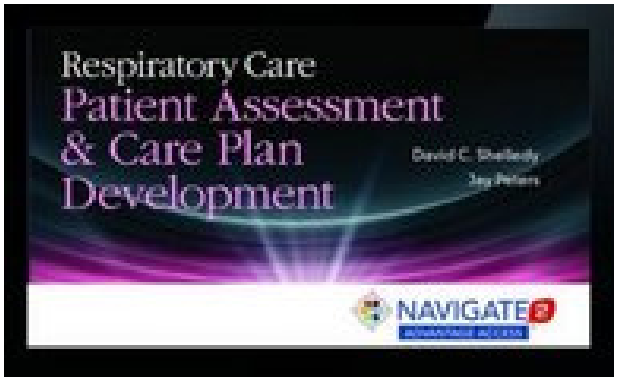

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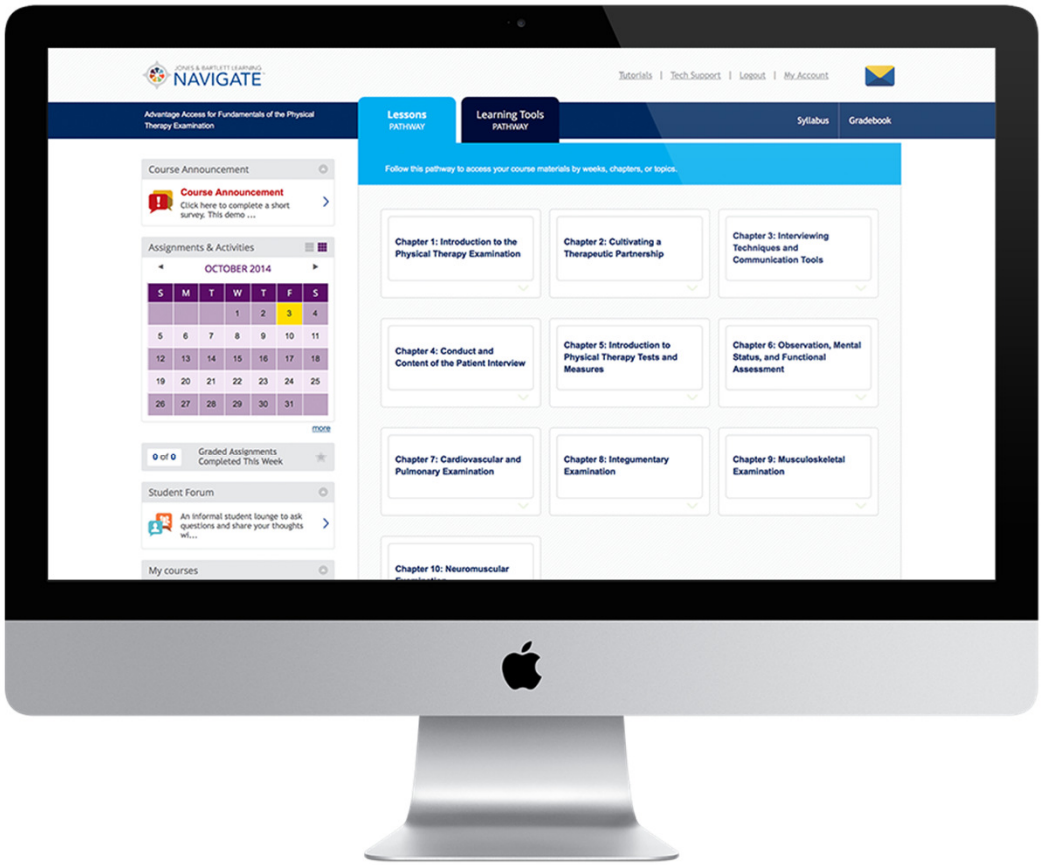
  - Lesson Quizzes
  - Midterm
  - Final



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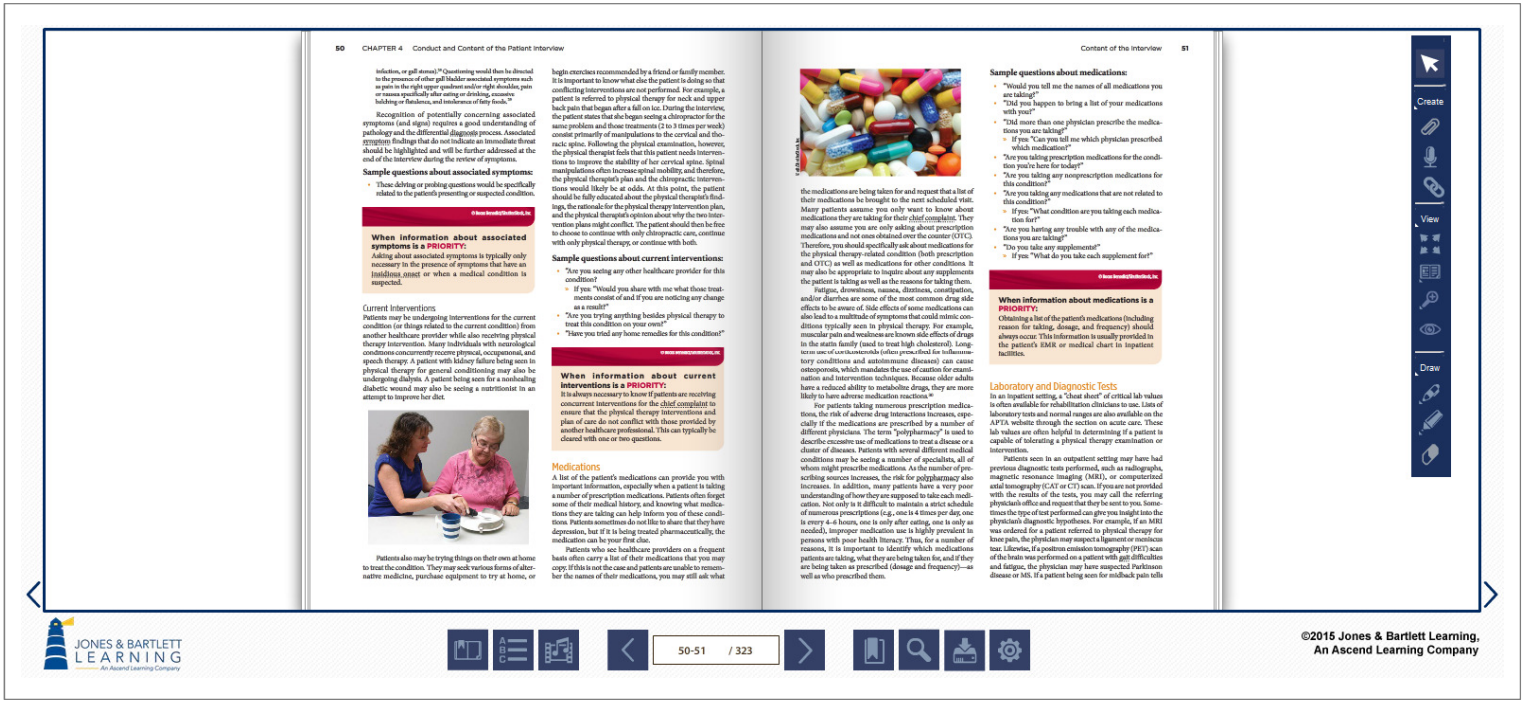
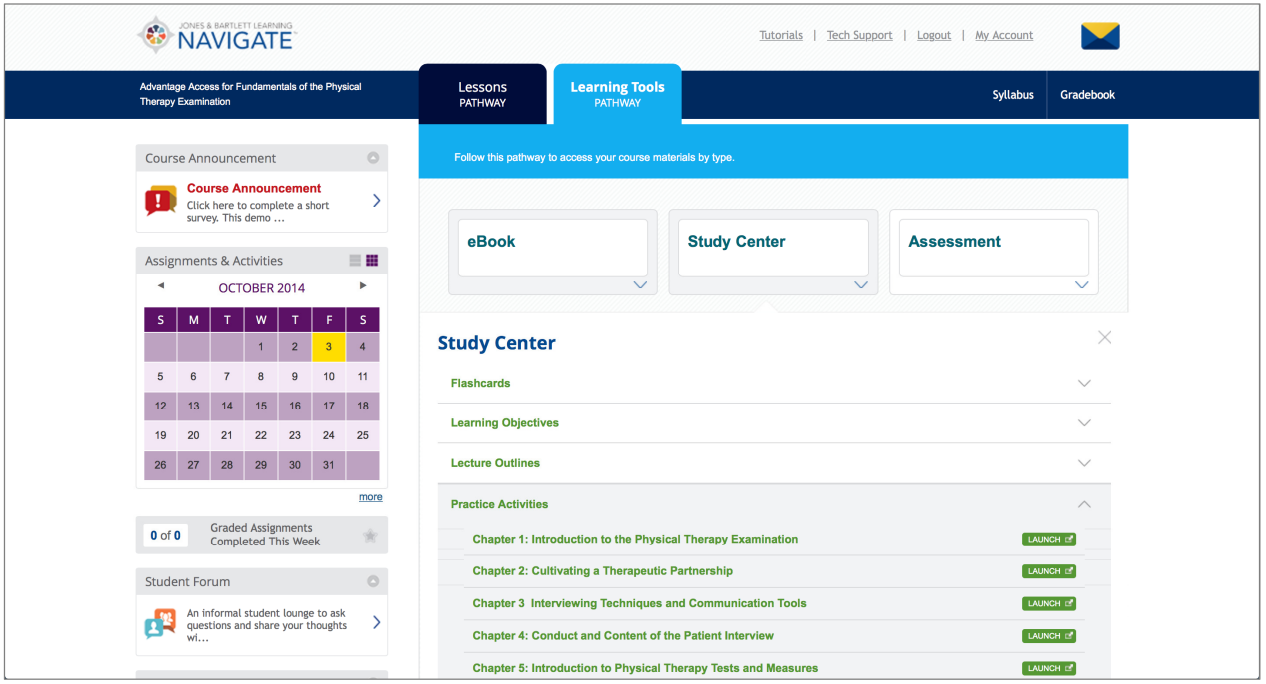
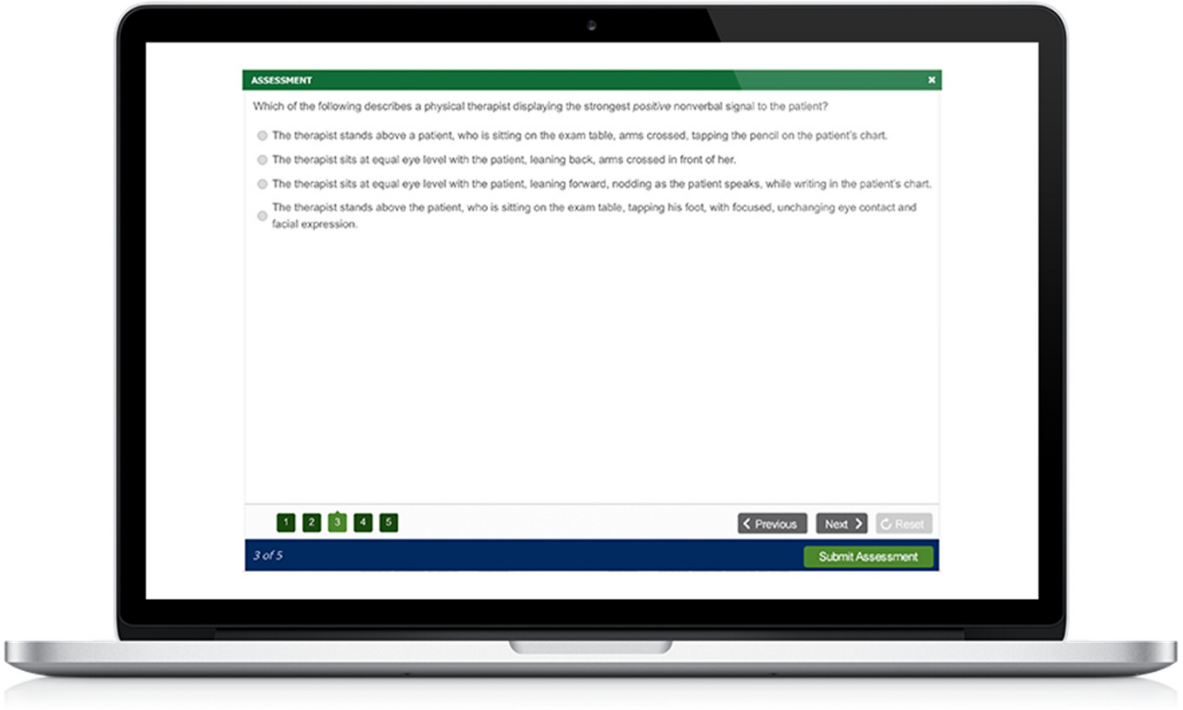


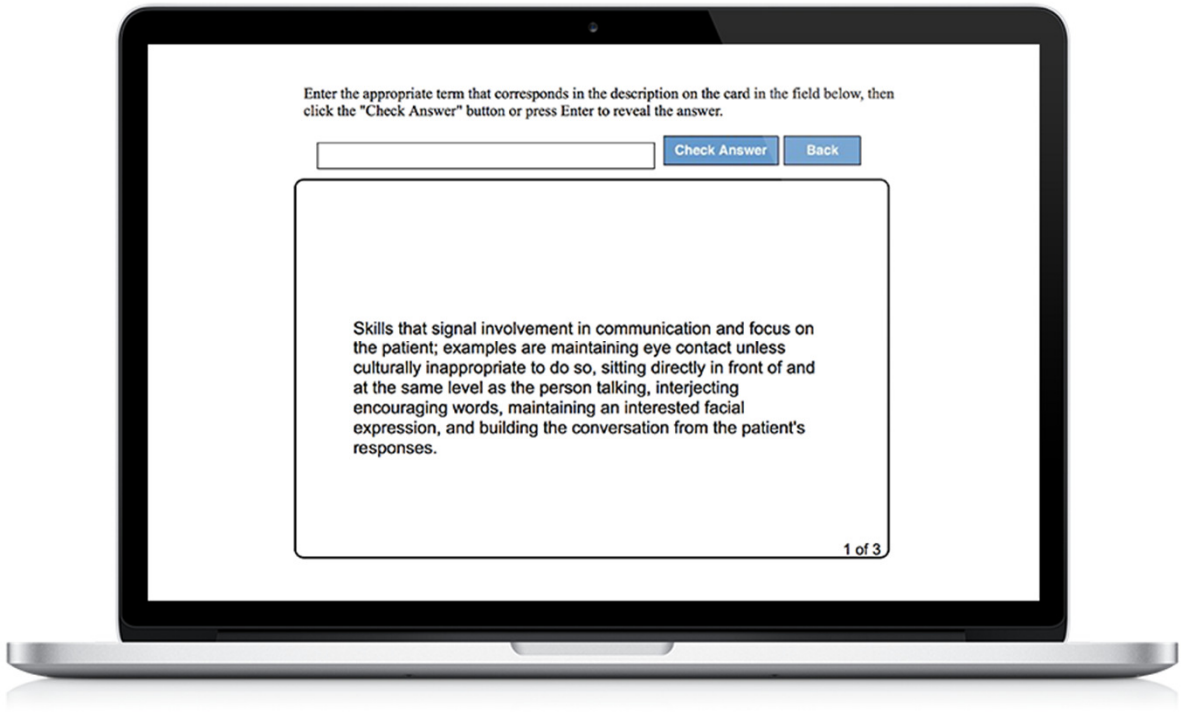
Study Center



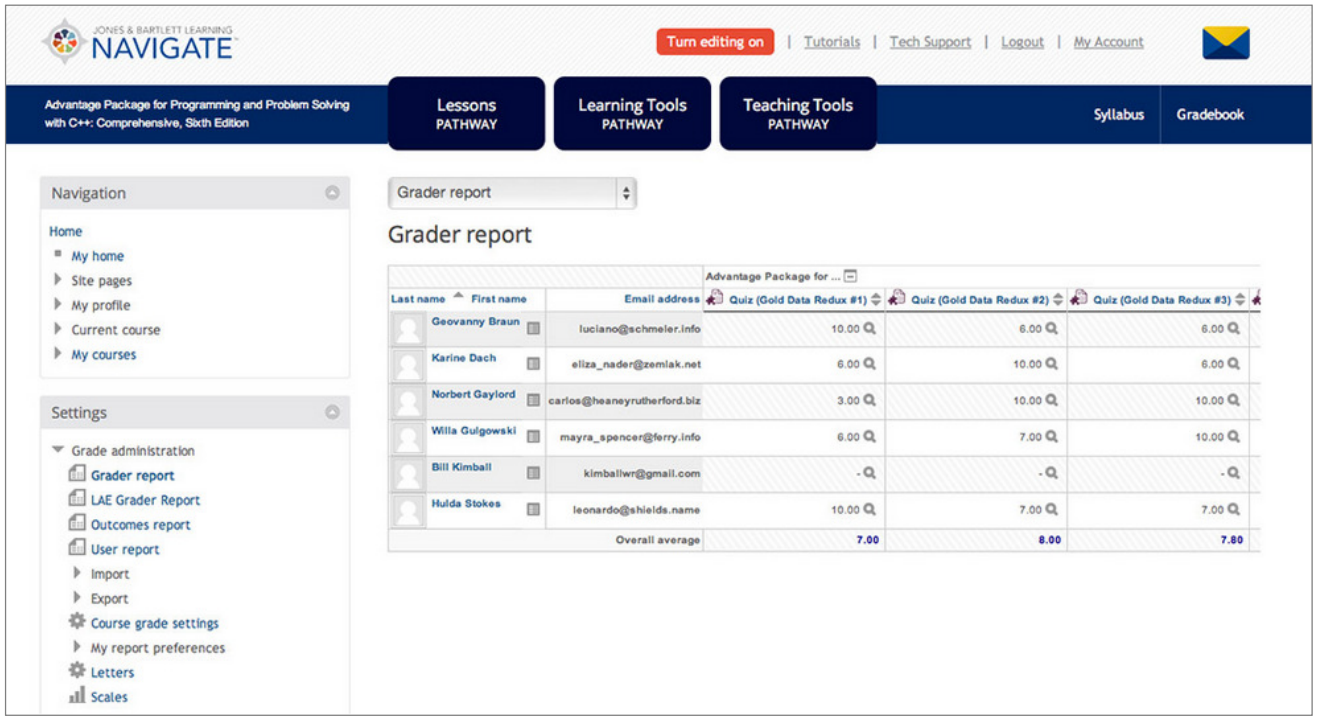
Knowledge Check Questions within eBook



Flashcards



Grade Book

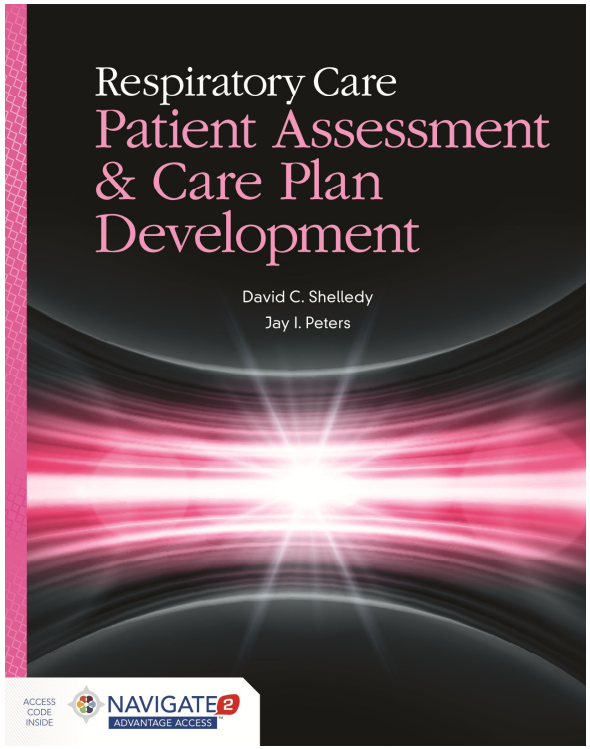


Recap of Features

- Content needed to pass the National Board for Respiratory Care entry level and advanced respiratory care examinations is included throughout
- Follows AARC Clinical Practice Guidelines
- Critical diagnostic thinking is reviewed and then applied to specific patient situations
- Chapter Objectives, Chapter Outlines, Key Terms, hundreds of full-color illustrations, photos & tables, Boxed Articles, Notes, and Clinical Practice Guidelines are incorporated into each chapter for enhanced student learning
- Boxed Chapter Features:
  • ***Clinical Focus***: Exercises designed to help refine critical thinking and problem-solving skills serve as mini-case studies which pose questions to readers so they can apply essential concepts to real-world scenarios
  • ***RC Insights!***: Interspersed throughout the text, these tips provide the clinician with useful information on patient assessment and management
  • ***Key Points***: Listed at the conclusion of each chapter, these recaps summarize important facts and concepts
- **Instructor Resources**: Lecture Outlines in PowerPoint Format, Test Bank, Sample Syllabus, and Image Bank
- **Student Resources**: Each new print copy includes Navigate 2 Advantage Access that unlocks a complete eBook, Study Center, homework and Assessment Center, and a dashboard that reports actionable data.

Thank you for joining us today to learn more about Respiratory Care: *Patient Assessment and Care Plan Development*

We hope you will enjoy adding this fabulous resource to your Respiratory Care curriculum.



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