CERTIFICATION REVIEW FOR REHABILITATION NURSING WORKBOOK

WORKING SMARTER NOT HARDER

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Notice: The clinical information and tools used in this course are based on current literature, research, and consultation with nursing, medical, and legal authorities. To the best of our knowledge, it reflects current practice. However, appropriate information sources should be consulted, especially for new or unfamiliar procedures.

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ACKNOWLEDGEMENTS

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# Table of Contents

Getting Started ................................................................................................................... x  
Launching the Course ........................................................................................................ x  
Continuing Education Hours ......................................................................................... xi  
Using the Course ............................................................................................................. xii  
Functions of the Navigation Bar ..................................................................................... xiii  
Other Features .............................................................................................................. xiv  
Unit 1 ~ Chapter 1 Overview .......................................................................................... 1  
  Chapter Objectives or What Is Your Job? ................................................................... 1  
  Preparation ..................................................................................................................... 2  
  My Study Plan .............................................................................................................. 3  
  The Exam—Getting Ready for Test Day ....................................................................... 4  
  Evaluate Your Current Status ...................................................................................... 4  
Unit 2 ~ Principles & Philosophy ...................................................................................... 6  
  Chapter 2 The Impact of History & Legislation on the Practice of Rehabilitation .......... 7  
  What Is Your Job in This Chapter? .............................................................................. 7  
  The Impact of History ................................................................................................. 8  
  Chapter 3 Philosophy & Values of Rehabilitation Nursing ......................................... 14  
  What Is Your Job in This Chapter? .............................................................................. 14  
  World Health Organization (WHO) Definitions ......................................................... 15  
  Defining Rehabilitation Nursing ................................................................................. 15  
  Rehab Nursing Roles .................................................................................................. 16  
  Values & Moral Principles .......................................................................................... 17  
  Chapter 4 Nursing Theories in Rehabilitation ............................................................... 19  
  What Is Your Job in This Chapter? .............................................................................. 19  
  Who? What? ............................................................................................................... 20  
  Gordon’s Functional Health Patterns ........................................................................... 21  
  Other Theorists ........................................................................................................... 21  
  Wellness ....................................................................................................................... 22  
  Chapter 5 The Economics of Rehabilitation ................................................................ 24  
  What Is Your Job in This Chapter? .............................................................................. 24  
  Funding Sources ......................................................................................................... 25  
  Living Expenses ......................................................................................................... 26  
Unit 3 ~ Special Populations & Team Issues ................................................................. 29  
  Chapter 6 Rehabilitation Teams & Teamwork ............................................................. 30  
  What Is Your Job in This Chapter? .............................................................................. 30  
  Team Membership ....................................................................................................... 31  
  Types of Teams ........................................................................................................... 32  
  The Continuum of Care .............................................................................................. 33  
  Coordination of Care ................................................................................................. 35  
  Goals ............................................................................................................................ 36  
  Conflict ....................................................................................................................... 37
# Table of Contents

## Unit 4 ~ Psychosocial Issues in Rehabilitation

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 8</td>
<td>Populations With Special Needs: Growth &amp; Development</td>
<td>44</td>
</tr>
<tr>
<td>What Is Your Job in This Chapter?</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Growth &amp; Development</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Developmental Pattern</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Types of Development</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Developmental Tasks</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Erikson’s Psychosocial Development</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Piaget’s Cognitive Stages</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Impact of Disability</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Special Issues: Healthcare</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Special Issues: Functional Skill Development</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Special Issues: Psychosocial</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Public Laws</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

## Unit 5 ~ Community Reentry & Education

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 9</td>
<td>Populations With Special Needs: Effects of Aging</td>
<td>52</td>
</tr>
<tr>
<td>What Is Your Job in This Chapter?</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Psychosocial Stages of Development</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Physiological Aspects of Aging</td>
<td>53</td>
<td></td>
</tr>
</tbody>
</table>

## Unit 6 ~ Anatomy & Physiology Review

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 12</td>
<td>Anatomy &amp; Physiology Review</td>
<td>78</td>
</tr>
<tr>
<td>What Is Your Job in This Chapter?</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>The Brain Puzzle</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>Right or Left?</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>Brain Strain I</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Brain Strain II</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>Brain Strain III</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Go With the Flow</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Head Bone’s Connected to the</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>In Control</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Chapter</td>
<td>Title</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Care of Patients: Stroke (CVA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What Is Your Job in This Chapter?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Types of Stroke</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk Factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stroke Syndromes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emergent Care</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alterations in Mobility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ADLs &amp; Transitions Home</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impaired Swallowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alterations in Nutrition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluid Balance Deficit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bowel Elimination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urinary Elimination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impaired Communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk of Injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sweetheart!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feeling Blue?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community Living</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Care of Patients: Traumatic Brain Injury (TBI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What Is Your Job in This Chapter?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severity of Injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Early Complications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cognitive Processes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pay Attention!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:1 With Brad</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Memory Impairment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Executive Function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Altered Nutrition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Altered Elimination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk for Injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Altered Sexuality Patterns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk of Caregiver Role Strain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community Living</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Care of Patients: Spinal Cord Injury (SCI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What Is Your Job in This Chapter?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Care of the Patient: Spinal Cord Injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severity of Spinal Cord Injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Types of Spinal Fracture</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spinal Cord Injury Syndromes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary &amp; Secondary Insults</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute Care</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respiratory Dysfunction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respiratory Care</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Avoid the Clot!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poikilothermia</td>
<td></td>
</tr>
<tr>
<td>Unit 8 ~ Care of Patients: Other Neurological Diagnoses</td>
<td>164</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>Chapter 17 Care of Patients: Other Neurological Diagnoses</td>
<td>165</td>
<td></td>
</tr>
<tr>
<td>What Is Your Job in This Chapter?</td>
<td>166</td>
<td></td>
</tr>
<tr>
<td>Multiple Sclerosis (MS)</td>
<td>166</td>
<td></td>
</tr>
<tr>
<td>Amyotrophic Lateral Sclerosis (ALS)</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>Guillain-Barré Syndrome (GBS)</td>
<td>168</td>
<td></td>
</tr>
<tr>
<td>Post-Polio Syndrome (PPS)</td>
<td>169</td>
<td></td>
</tr>
<tr>
<td>Parkinson’s Disease (PD)</td>
<td>169</td>
<td></td>
</tr>
<tr>
<td>Cerebral Palsy (CP)</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>Spina Bifida (SB)</td>
<td>171</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 9 ~ Care of Patients: Other Diagnoses</th>
<th>173</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 18 Care of Patients: Other Diagnoses</td>
<td>174</td>
</tr>
<tr>
<td>What Is Your Job in This Chapter?</td>
<td>174</td>
</tr>
<tr>
<td>Care of Patients: Amputation</td>
<td>175</td>
</tr>
<tr>
<td>Comorbidities</td>
<td>175</td>
</tr>
<tr>
<td>Dressing for Residual Limbs</td>
<td>175</td>
</tr>
<tr>
<td>Adjustment to Amputation</td>
<td>176</td>
</tr>
<tr>
<td>Risk for Contracture</td>
<td>177</td>
</tr>
<tr>
<td>Phantom Limb Pain</td>
<td>177</td>
</tr>
<tr>
<td>Prosthetic Time</td>
<td>178</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>179</td>
</tr>
<tr>
<td>Joint Replacement</td>
<td>180</td>
</tr>
<tr>
<td>Rheumatoid Arthritis</td>
<td>181</td>
</tr>
<tr>
<td>A Balance of Rest &amp; Activity</td>
<td>183</td>
</tr>
<tr>
<td>Living Life</td>
<td>183</td>
</tr>
<tr>
<td>Chronic Pain Syndrome</td>
<td>184</td>
</tr>
<tr>
<td>Managing Pain</td>
<td>185</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>186</td>
</tr>
<tr>
<td>Risk Factors for Osteoporosis</td>
<td>186</td>
</tr>
<tr>
<td>Care of the Patient With Osteoporosis</td>
<td>187</td>
</tr>
<tr>
<td>Cardiopulmonary Disease</td>
<td>187</td>
</tr>
<tr>
<td>Pulmonary Disease Risk Factors</td>
<td>188</td>
</tr>
<tr>
<td>Restrictive vs. Obstructive Disease</td>
<td>188</td>
</tr>
<tr>
<td>What’s in It for Me?</td>
<td>190</td>
</tr>
<tr>
<td>Acute Management</td>
<td>190</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>191</td>
</tr>
<tr>
<td>Cancer</td>
<td>192</td>
</tr>
<tr>
<td>Types of Burns</td>
<td>193</td>
</tr>
<tr>
<td>Acute Systemic Problems</td>
<td>194</td>
</tr>
<tr>
<td>Rehabilitation of Burn Injuries</td>
<td>195</td>
</tr>
<tr>
<td>Answer Key</td>
<td>198</td>
</tr>
</tbody>
</table>
GETTING STARTED

This course is designed to assist nurses to prepare for the national certification exam. This workbook is intended to be used with the Rehab ClassWorks® computer course: Certification Review for Rehabilitation Nursing. It also may be used as an adjunct to classroom or study group review sessions or for other varieties of self-study. Feel free to contact Rehab ClassWorks® for more study ideas or assistance at (888) 294-0412.

Launching the Course

**Single User License:** After installing the course, launch it on the computer by selecting it from your Windows menu or by using the desktop icon.

**Multiuser License:** Follow your organization’s instructions for accessing the course.

Logging In

Enter your login name as the name you want to see on the CE certificate. Select your own password and keep track of this information so you can use it in the future to enter the course. (Support cannot access this information.) Click the Start button on the login page to view the menu.
Functions of the Main Menu

The course is navigated from its **Main Menu**.

1. You can roll your mouse onto a unit title to display information about a given unit.
2. Click on the unit title to enter the unit.
3. Start with the **Overview** chapter for an introduction to the course and access to course **Help** tools.

Continuing Education Hours

In order to receive continuing education contact hours, complete the course and workbook activities, pass the course posttest with a score of 80% or better, and complete the course evaluation per instructions provided below.

- This course is worth 43.2 contact hours.

The posttest is in the computer course that accompanies this workbook. Your results are displayed on the computer when you complete the exam. Upon successful completion of the posttest, follow the instructions in the posttest to generate your CE Submission # and to **print or create a screen shot** of your **Score Page**. **Once you have left this page, you will not be able to return to it without taking (and passing) the test again.**

*The standard screenshot command of **ALT+PrintScreen** (PrtSc) works on most PCs. In cases where a successful print or screenshot cannot be obtained, a picture (taken on a phone, for example) will be accepted if the photo is readable and shows the entire score page.*

To receive contact hours you must submit both the **Score Page** and the **Course Evaluation** form. **Follow these instructions to submit for a contact hours certificate.**

- The **Score Page** document must be manually sent to Rehab ClassWorks, LLC (RCW); there is no way to electronically submit it from the course. Use one of the following methods. (Keep a copy for your records.)
The required **Course Evaluation** form, submitted electronically, is located online at [www.rehabclassworks.com/CEData.html](http://www.rehabclassworks.com/CEData.html). If you have difficulty accessing the **Course Evaluation** web page, contact us:

- By phone, at (801) 254-0412 or (888) 294-0412
- By email, at ceRequest@rehabclassworks.com

**Only persons with valid, registered serial numbers will receive continuing education credit.** Go to [www.rehabclassworks.com/reg.html](http://www.rehabclassworks.com/reg.html) to register the purchase of your course! (NOTE: Those with multiuser licenses are only required to register once for the group via the person managing the course.)

The expiration date for this course can be found at: [http://www.rehabclassworks.com/FAQ.htm](http://www.rehabclassworks.com/FAQ.htm).

*Rehab ClassWorks, LLC is an approved provider of continuing nursing education by the Western Multi-State Division, an accredited approver by the American Nurses Credentialing Center’s Commission on Accreditation.*

## Using the Course

Listed below are features of the computer course and how to best use them.

**Workbook and Computer Course:** To get the most out of this course, you should use this workbook concurrently with the computer course. **There is a great deal of audio in the course, so be sure your speakers are on.** There are exercises in the workbook and in the computer course to help you learn and remember the material. When you see the following, you should go to the designated section of the course on the computer.
On the computer

Note that each chapter in the workbook matches the chapter of the same name in the computer course. Answers to questions in the workbook are in the back of the workbook for your reference.

This course is a lengthy course and thus should be approached **in small periods of time for best retention.** Each unit in the computer course has a bookmarking feature so that you can return to the page you last viewed when you return to that unit. **Be sure to exit the course using the EXIT button** on the bottom right of the course navigation bar (not the X on the top right corner of the window) to initiate the bookmark.

**Quizzes:** There are quizzes at the end of each unit of the computer course to help you assess your understanding of the information in that part of the course.

**Links:** There are links in the computer course that take you to more information when you click on them. They appear in **blue underlined text.** If your internet security system allows you to do so, you will be able to jump to external web pages as well as internal links while in this course. Otherwise, type the address in your web browser to view those resources.

**Functions of the Navigation Bar**

The **Navigation Bar** at the bottom of the screen allows access to information, return to the **Main Menu,** or the ability to go to a specific page in the course.

**Page Numbers:** Page numbers in the computer course are located on the left side of the **Navigation Bar.**

**Reference:** The **Reference** link displays definitions of terms and additional reference material.
Main Menu: Return to the Main Menu by clicking that item on the Navigation Bar.

Index: You can use the Index link to display the electronic pages of the unit. Click on the page you want to go to when this tool is open.

Help: This item provides information on using and navigating the course. If you do not find your answer there, contact technical support at techsupport@rehabclassworks.com or call (888) 294-0412.

Read: This item opens a window that allows you to read the audio that occurs in a given frame.

Progress Report: The Progress Report summarizes your scores on quizzes in the course. The posttest score is also recorded, but not the subset scores you will see at the end of the posttest. Only posttest scores are reported in a learning management system. Quizzes are for self-assessment of content learned in each unit and are not reported in a learning management system.

Other Features

Notes Books/Feedback: Some screens contain a Notes Book icon in the top right corner. You can click on this icon for feedback or more information. The Notes Book icon is pictured here on the right.
**CHAPTER 1**

**OVERVIEW**

As with any test, preparation is the key to success. Establish your goals and plan your studying to maximize your efforts and decrease the stress and anxiety associated with the exam.

Chapter Objectives or What Is Your Job?

In this chapter, your job is to review the prerequisites for sitting the rehabilitation nursing certification exam and to develop a study plan of your own.

硐 Chapter Highlights

- Success in passing the national certification exam for rehabilitation nurses requires experience, confident test-taking skills, and preparation.

- This is a lengthy course. Plan for adequate study time, listen to audio, and click on hypertext links and the Notes Books to access all available information.

- Use a plan that works for you to prepare for the exam, making sure you are organized and prepared on test day.

- The pretest can provide you with a prescriptive report to help you plan your study time.

- Additional support is available at www.rehabclassworks.com/Blog.htm.
Preparation

Time is a precious commodity! Preparation is critical to your success in passing the certification exam. Many of us try to squeeze studying in between thousands of other activities demanding our attention. Unfortunately, this can lead to longer hours of studying and increased stress as we get closer and closer to the exam date. Make the most of your study time by following these suggestions:

- **Get organized!** Give yourself a sense of control and reduce your stress and anxiety. Commit the time and effort to do it well and to do it right the first time.

- **Set up short, intermediate, and long-term goals.** Post your goals and regularly track your progress. If you begin to lag behind, either redefine your goals or implement appropriate interventions to get back on track.

- **Study in 15-30 minute blocks.** Retention is better when you study for short periods. If you must include more hours of studying in a given session, take a short break every 15-30 minutes to allow your brain to refresh itself.

- **What works for you?** Think back through previous successful study sessions you have had and apply the successful processes to studying for this exam. You probably have study habits that have been very helpful to you in the past, including note taking, practice tests, highlighting, memorization strategies, etc. What are your needs for auditory, visual, and tactile input? How are you going to meet them? Are certain environments more conducive to learning than others? Are they available to you? What kind of help and support will you need to be successful? Create a plan for **you**!
My Study Plan

Long-term goals:

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Short-term goals with target dates (check frequently to track progress):

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Study plan (include days, time, frequency, and strategies to stay organized):

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The Exam—Getting Ready for Test Day

Contact the Association of Rehabilitation Nursing – Rehabilitation Nursing Certification Board for the test packet (http://www.rehabnurse.org/certification/content/Applications.html). You will need to complete and submit an application online by the deadline. Watch for contact from the testing center for a testing date.

- **Complete the test packet.** There are several steps to the completion of the test application packet. Failure to complete it will result in denial of your application to sit the exam.

- **Familiarize yourself with the test site.** Know how long it takes to get there and where you will park. Remember that if you are late, you will forfeit your reservation and still owe the full examination fee, unless you are able to provide written verification and supporting documentation of an excused absence.

- **Get organized!** Collect all your supplies and tools for the test in advance to avoid last minute rushing and stress.

- **Read all test directions carefully.** Use the practice screens in the test to familiarize yourself with the testing process.

- **Relax so that you can think!** Guided imagery and relaxation techniques for stress control can help you alleviate test anxiety. Learn and practice such techniques, if you feel you may need to use them. If you need more ideas for reducing test stress, go to www.rehabclassworks.com/CertRevResources.htm.

Evaluate Your Current Status

Please take the **pretest** in this *Certification Review for Rehabilitation Nursing* course now. This is an evaluative test. If you don’t know the answer, just make your best guess. Then, use the results to refine your study plan. You may want to make note of your sub-scores.

The national certification exam for rehabilitation nurses is a comprehensive exam of the professional role of the rehabilitation nurse. This course is a review
course, not an all-encompassing course for the professional practice of rehabilitation nursing. The course presumes previous rehabilitation nursing education and knowledge.

In an effort to expose the learner to the wide variety of questions, the tests may ask questions on items not specifically covered in this review course. This additional content (e.g., cultural competence, side effects of commonly-administered medications, and general patient safety behaviors) is widely used in general rehabilitation nursing practice and/or is available in other resources or in other courses in The Rehab Nursing Series™.

This course is the last course in The Rehab Nursing Series™. If you need to dive more deeply into rehab-specific topics, please review the other courses in the series. They are listed on page iv.

On the computer: Complete the Overview pretest, page 11.

Make notes and make a plan based on the results of the pretest. Then, go to the next page in this workbook to start the next unit, Principles & Philosophy.

- If you are using The Specialty Practice of Rehabilitation Nursing: A Core Curriculum as an additional study tool, supporting pages are noted in boxes like these at the end of each chapter.
PRINCIPLES & PHILOSOPHY

This unit of the workbook contains four chapters.

- The Impact of History & Legislation on the Practice of Rehabilitation (Domain IV, Task 1: Integrate legislation and regulations into care management to promote independence)

- Philosophy & Values of Rehabilitation Nursing (Domain I, Task 1: Use the nursing process to incorporate models and theories into practice)

- Nursing Theories Applicable to Rehabilitation (Domain I, Task 1: Use the nursing process to incorporate models and theories into practice)

- Economics Issues in Rehabilitation Care (Domain IV, Task 2: Use the nursing process to deliver cost-effective care)

You may proceed in this order or select the chapter you prefer to study. There are matching chapters in the computer course for each of the workbook chapter titles above. Simply go to the correct page on the computer and in the workbook to pursue your selection.

On the computer: Return to the Main Menu to start this unit, Rehabilitation Principles & Philosophy, pages 1-2.
CHAPTER 2

THE IMPACT OF HISTORY & LEGISLATION ON THE PRACTICE OF REHABILITATION

How has our past influenced our present and how will it impact our future?

What Is Your Job in This Chapter?

In this chapter, your job is to review historical events and legislation and their impact on the development of rehabilitation services.

On the computer: Principles & Philosophy, pages 3-14

Chapter Highlights

- Social and political systems have a dramatic impact on healthcare regulations and access to services.

- Use what you know about history to relate to legislative changes. It will help you solve problems on the test about when legislation occurred.

- The Americans with Disabilities Act, Individuals with Disabilities Education Act, Balanced Budget Act, Medicare laws, and the Affordable Care Act have had a dramatic impact on service requirements and access to care.

- Rehabilitation nurses must be aware of changes in technology, populations, regulations, legislation, and social constructs affecting care.
Social and political systems have dramatically influenced the development of healthcare services, and necessity continues to be the mother of invention. As a result, war has been a driving force in the development of rehabilitation services. The impacts of war, combined with the technological advancements of the last century, have created survivorship of disease and catastrophes unlike any previously experienced. Today policies, rules, and regulations concerning access to care and resources, cost structures, and quality of life are debated, politicized, and covered by the media in a dramatic and extraordinary manner. Change is widespread and continuous. Where are we going from here?

The Impact of History

Think about the impact of history on rehab services and answer the questions below.

1. What changes contributed to the organization of services for the disabled in the 1890s and early 1900s?

2. What historical event during the early 1900s created the next significant impact on the development of rehabilitation services? How?
3. The 1930s brought legislative and healthcare issues to the forefront. The **Social Security Act** was passed in 1935, creating and impacting many services for those in need. How did the issues of this decade impact rehab services?

4. A major advance in medical care occurred in the 1940s. It had a profound impact on the development of rehab services by increasing survivorship. What was that major advance?

5. The post-World-War-II era noted both social and healthcare trends that significantly impacted rehabilitation. What were those trends?

6. What was the impact of the Korean and Vietnam Wars on rehabilitation?
7. What was the social impact of the 1960s on rehabilitation care?

Vocational rehabilitation expanded with laws such as the **Vocational Education Act of 1984**. This act required states to provide funds for those with disability, allowing them access to available vocational education opportunities.

8. What factors drove the development of rehabilitation services during the 1970s and 1980s?

9. What act, passed in 1973 as a precursor to the ADA, contained content that required all buildings receiving federal funds to accommodate persons with physical disability and nondiscrimination in employment?

The 1990s once again delivered many significant acts of legislation that impacted healthcare and those with disability. The impact of alternative medicine was acknowledged when the **1998 Omnibus Appropriations Bill** established the National Center for Complementary and Alternative Medicine (NCCAM). This center, now known as the **National Center for Complementary and Integrative Health (NCCIH)**, researches complementary and integrative therapies and publicizes the resulting information.
The NCCIH has many clinical research programs in place and is an information clearinghouse, working closely with other agencies, such as the Agency for Healthcare Research and Quality, to establish evidence of the safety and effectiveness of interventions. While this was an important piece of legislation that reflected on the ways healthcare was changing, it was not considered the most important legislation of this decade regarding disability.

10. What was the most important legislation regarding disability passed in the 1990s?

11. What does Title I of this act address?

12. What does Title II of this act address?

13. What does Title III of this act address?

14. What does Title IV of this act address?

The demand for rehab services has continued to change during this century to meet the demands of increasing numbers of elderly persons, and persons of every age with one or more chronic illnesses (an illness that lasts for 3 or more months). Research and technology continue to develop new strategies for improving quality of life and recovery following injury.
Costs of healthcare stayed on the table as the **Balanced Budget Act of 1997**
was implemented. The **Deficit Reduction Act of 2005** continued efforts at
saving healthcare dollars by requiring that the Centers for Medicare & Medicaid
Services (CMS) develop a standardized patient assessment tool that can be used
across all post-acute care settings to facilitate appropriate transitions and post-
acute payment reform.

15. What are the impacts of all these trends in history and legislation on
our practice and on the care of patients in the future?

The needs of children with developmental disabilities have been addressed since
1975 when the **Education for All Handicapped Children Act** was passed.

Revisions have improved the original law, emphasizing access, evaluation,
transition services, assistive technology, rehabilitation counseling, and more. It
was renamed the **Individuals with Disabilities Education Act (IDEA)** in
1990 and was updated in 1991 to include a section addressing acquired brain
injury.

Significant changes were made in 1997, and it was since then updated to the
**Individuals with Disabilities Education Improvement Act of 2004** (now
known as IDEIA).

16. What tool is required by IDEA to facilitate planning of education
programs?

While facing legal challenges and continued debate, the **Patient Protection
and Affordable Care Act** is being implemented in stages, directly impacting
access to care and the type of care available. Payment strategies are expected
to change over the next decade in response to the demands of this act and to the realities of the limits of our financial resources.

Demonstration projects abound across the country, including alternative funding, medical home models, and other alternatives to post-acute care. Meanwhile, CMS, operating at the direction of the Improving Medicare Post-Acute Care Transformation Act of 2014, began collecting comparative outcomes and quality data across all post-acute venues.

Rehabilitation nurses are knowledgeable about the needs of persons with disability and can advocate on their behalf by being politically aware and active. Start in your local community by providing expertise and voicing opinions. Pick an issue of concern and follow it. Stay informed, write a letter, and use your influence to shape the future of healthcare and the lives of those with disability.

Match the law to the correct year.

17. _____ Social Security Act defines rehabilitation
18. _____ Balanced Budget Act
19. _____ Americans with Disabilities Act
20. _____ Rehabilitation Act establishes standards for individualized treatment plans
21. _____ Individuals with Disabilities Education Act amendment regarding brain injury
22. _____ Improving Medicare Post-Acute Care Transformation Act

Read the next page in this workbook to start the next chapter.

Core Curriculum supporting pages: 5-6, 13-14, 21-26, 56-58, 206-210
Chapter 3

Philosophy & Values of Rehabilitation Nursing

The nurse is the pivot point of all inpatient rehabilitation care. His or her success or failure in blending all that the patient learns in therapy into daily care will drive the success, failure, and efficiency of the program.

What Is Your Job in This Chapter?

This chapter helps you review conceptual frameworks used to describe disability, to define goals and roles of rehabilitation nurses, and to review ethical practice issues.

Chapter Highlights

- The World Health Organization’s International Classification of Functioning, Disability, and Health (ICF) describes impacts of impairments.
- Ethical issues abound in rehabilitation. Ethical principles drive care and form the foundation of laws that protect patients from unethical behavior.
- Ethics committees and ethical decision-making processes provide structure and balance for the rehabilitation team when they are faced with a difficult ethical decision. Many of the decision-making processes resemble the nursing process.
- Spirituality is more than religious preference. It is hope, one’s concept of God, relationships between health and beliefs, and religious practice.
World Health Organization (WHO) Definitions

Rehabilitation addresses impairments and activity limitations that cause deficits in participation, as participation is defined by the World Health Organization. Our assessments are used to identify the patient’s limitations. Our interventions are used to reduce activity limitations. Our community reentry activities, education, and laws are designed to reduce participation restrictions.

Match these terms to their definitions.

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Activity</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>___________</td>
<td>The nature and extent of functioning at the level of the person</td>
</tr>
<tr>
<td>2.</td>
<td>___________</td>
<td>A loss or abnormality of a physiological or psychological nature</td>
</tr>
<tr>
<td>3.</td>
<td>___________</td>
<td>The nature and extent of a person’s involvement in life situations related to impairment, activities, health conditions, and contextual factors</td>
</tr>
</tbody>
</table>

Defining Rehabilitation Nursing

ARN defines rehabilitation nursing as “the diagnosis and treatment of human responses of individuals and groups to actual and potential health problems relative to altered functional ability and lifestyle.”

Indicate whether the following statements are True or False.

4. _____ Rehabilitation nursing has a specialized body of knowledge.

5. _____ Rehabilitation nursing is a philosophy of care that can be practiced in any setting.

6. _____ Rehabilitation nursing has a defined scope of practice and related accountabilities.
Rehab Nursing Roles

In order to achieve the goals of rehab nursing, rehab nursing roles are many and varied.

*Match the following nursing roles to the correct description.*

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>educator</td>
<td>Nurses provide care that is consistent, thorough, and supportive of the patients' and caregivers'</td>
</tr>
<tr>
<td></td>
<td>efforts to learn their own care. Caregiving is integrated with education and identification of the</td>
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<tr>
<td></td>
<td>tools and resources needed to transfer care responsibilities to the patient/caregiver.</td>
</tr>
<tr>
<td>caregiver</td>
<td>Nurses facilitate coping and support patients and families as they prepare for community living.</td>
</tr>
<tr>
<td>advocate</td>
<td>In order to do this well, the nurse must know the patient's wishes and desires well enough to be an</td>
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<tr>
<td></td>
<td>effective and true representative. The nurse often spends more time with the patient than other team</td>
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<td></td>
<td>members do and may have more insight to the patient's desires. This is also a self-care skill that</td>
</tr>
<tr>
<td></td>
<td>should be taught to patients and caregivers.</td>
</tr>
<tr>
<td>collaborator</td>
<td>This is one of the most important roles of a nurse in a rehab setting. One of our basic principles is</td>
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<tr>
<td></td>
<td>that every nursing encounter is a potential teaching opportunity—an opportunity to teach them how to</td>
</tr>
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<td></td>
<td>live, not just survive, in the community.</td>
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<tr>
<td>coordinator</td>
<td>Effective and efficient care results from the efforts of all team members working together to be</td>
</tr>
<tr>
<td></td>
<td>creative, problem-solve, and promote functional gains in each patient.</td>
</tr>
<tr>
<td>counselor</td>
<td>The rehab nurse has responsibility for the patient around the clock. Practicing skills repeatedly</td>
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<tr>
<td></td>
<td>throughout the day, in a coordinated and consistent manner, will help patients acquire effective</td>
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<tr>
<td></td>
<td>problem-solving skills and become experts in their own care.</td>
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</table>
Values & Moral Principles

Ethical issues are difficult. They are value judgments, and values vary among individuals. Laws represent strongly-held values, which results in ethical debates often having legal consequences. The nurse is accountable to know and understand the laws that impact nursing practice. Superseding these laws are ethical statements and guidelines published by nursing associations.

Technological advances, cost containment, legislation, and self-advocacy movements will continue to present ethical dilemmas for the rehab team. Successful navigation of these issues requires a clear understanding of one's own values, as well as the ability to understand the values and opinions of your patients and their families. Ethics committees are often used to address ethical dilemmas in healthcare.

Applying Moral Decision Making

Moral decision making is a process of using ethical principles when making a decision that occurs from a **moral dilemma** (two or more moral principles apply but support mutually-inconsistent actions) or **moral distress** (a person knows the right thing to do, but outside constraints make it impossible to do so).

- Ethical models provide a foundation for moral decision making.
  - Deontology
  - Utilitarianism
  - Objectivism
  - Social equality and social justice

- Decision-making models provide guidance for decision making.
  - ACT model
  - Savage model

- Laws, policies, and regulations direct ethical behavior.

o Laws governing informed consent and many other aspects of care

Schmidt, 2015

(Use the Reference link on the navigation bar in the computer course for definitions of these and other ethics terms.)

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*Read the next page in this workbook to start the next chapter.*

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*Core Curriculum* supporting pages: 3-5, 7-11, 39-59, 329-333
Chapter 4

Nursing Theories in Rehabilitation

Theories of nursing are constantly evolving in response to research.

What Is Your Job in This Chapter?

Your job in this chapter is to review key theories that have tried to explain interactions between healthcare providers and their patients.

On the computer: Principles & Philosophy, pages 27-36

Chapter Highlights

- Nursing theorists take different approaches to care of the patient. Different theories may be more applicable to some patient situations than others.
- Gordon’s functional health patterns can be helpful in organizing data during assessment.
Theories allow us to define our practice and guide us in the provision of care. Knowledge of different theories can provide resources and options to meet the various needs of patients in different settings.

Use the following exercises to review select theories applicable to rehabilitation nursing in a wide variety of settings. Remember that rehabilitation is a process, and consider options for the continuum of care.

**Who? What?**

*Identify the nursing theorists associated with the following theories.*

<table>
<thead>
<tr>
<th>King</th>
<th>Orem</th>
<th>Neuman</th>
<th>Roy</th>
<th>Rogers</th>
<th>Hall</th>
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</table>

*Identify key concepts of each of the following theorists.*

7. Hall:

8. Rogers:

9. King:
10. Neuman:

11. Orem:

12. Roy:

Gordon’s Functional Health Patterns

Many nursing models and processes of documentation utilize Gordon’s functional
health patterns. The patterns facilitate delivery of holistic care when all the
components are used.

13. List the five functional health patterns that reflect psychosocial
functioning.

Other Theorists

Roper’s model for living and its corresponding model for nursing are other
models that focus on activities of daily living that are typical of each person and
the things they do on a daily basis. Each of the categories, which are
comparable to Gordon’s functional health patterns, is evaluated on a
dependence-independence continuum. The factors that influence this continuum
are categorized as biological, psychological, sociocultural, environmental, or
politico-economic.
There are many other nursing theorists whose theories may be applicable to rehabilitation nursing care. Consider the following examples.

- Jean Watson’s caring science

A good summary of nursing theories and their applications can be found at [http://currentnursing.com/nursing_theory/](http://currentnursing.com/nursing_theory/).

**Wellness**

Wellness is a concept with different meanings. Ask yourself:

- What is wellness? What is the impact of health maintenance behaviors on recovery and adjustment to disability? Why do some people survive the impact of injury and disability better than others?
- Why do people who know better still practice behaviors that are obviously not in their best interest? How are healthcare providers justified in criticizing patients for noncompliance and poor choices of behaviors when they continue to smoke, fail to exercise, etc.? Why do they think they would make better choices in the same situation?
- What is the effect of labeling the patient noncompliant or maladaptive rather than determining the cause of the behavior?
- How does the stress of the situation affect our ability to teach and the patient's/caregiver's ability to learn?
- What effects do current lengths of stay and pressures for productivity have on assisting a patient to cope with significant alterations in lifestyle?

Many people have studied these questions, producing theories about different responses to stressors, beliefs, and behaviors associated with health.
management and self-esteem and about the impact of personal belief systems on survival of illness and injury. An understanding of these issues is important to the success of the patient's rehabilitation program. Understanding wellness theories, and evaluating your patient's previous behavior patterns in relation to them, may indicate how he will approach recovery and rehabilitation.

Wellness theory reflects on a person's ability to achieve high levels of self-maintenance and performance. It is commonly said that without one's health, everything else becomes harder. Wellness is a personal responsibility.

Bandura’s social cognitive theory, addresses self-efficacy and emphasizes a person’s self-perception of abilities. (Use the Reference link on the navigation bar in the computer course for more information on self-efficacy).

*Match these wellness theories with the correct theme or component.*

<table>
<thead>
<tr>
<th>self-efficacy</th>
<th>hardiness</th>
<th>locus of control</th>
<th>health belief model</th>
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<tr>
<td>14. Low levels result in powerlessness and alienation</td>
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<tr>
<td>15. Belief about whether a contingency relationship exists between one's own actions and outcomes</td>
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<td>16. The main factors affecting my health are my beliefs in my own ability to achieve my goal</td>
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<tr>
<td>17. Perceived barriers directly impact decision making</td>
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*Read the next pages in this workbook to start the next chapter.*
Chapter 5

The Economics of Rehabilitation

Funding continues to have a significant impact on access to and utilization of services. Changes in Medicare law have impacted every level of post-acute care over the last decade. Cost containment efforts continue to impact how care is delivered.

What Is Your Job in This Chapter?

Your job in this chapter is to review types of funding sources, eligibility issues, and economic challenges of rehabilitation care.

Chapter Highlights

- Medicare, Medicaid, Workers Compensation, and private insurance provide the majority of insurance coverage for patients in rehabilitation.

- Patients must meet criteria in order to be eligible for Medicare or Medicaid; patients must be injured while working for an insured employer for Workers Compensation coverage to apply.

- Income options following a disability that limits employment are determined by previous employment history, private disability insurance, and state low-income programs.

- Rehabilitation nurses must focus on providing care that reduces the financial, as well as the physical and emotional, burden on caregivers.
Payers and payer systems dramatically impact service availability and utilization. Concerns about the costs of healthcare have led to numerous proposals and experiments in alternative methods of care delivery.

Discussions regarding healthcare reform must consider access, quality, cost-containment, and fairness. We will be forced to address ethical issues of universal access as well as rationing of care. It is impossible to pay for everything for everyone.

Rehabilitation nurses must use critical thinking when learning about proposed healthcare reform and actively advocate for an appropriate balance of care delivery.

On the computer: Principles & Philosophy, pages 37-46

Funding Sources

Most laypeople do not have a solid understanding of their healthcare benefits and require significant support to navigate through the insurance system. Rehabilitation nurses should be knowledgeable regarding a patient’s eligibility and coverage, and should incorporate that information into a reasonable and affordable plan of care.

Identify the coverage you would expect to see for each of the following patients.

<table>
<thead>
<tr>
<th>Medicaid</th>
<th>private insurance</th>
<th>Medicare</th>
<th>Workers Compensation</th>
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</tr>
</tbody>
</table>

1. ___________________________ A 68-year-old auto mechanic who had a stroke; assets of $300,000

2. ___________________________ A 23-year-old university student working part-time as a clerk, who sustained a TBI in a motorcycle accident; assets of $2500

3. ___________________________ A 26-year-old iron worker who sustained a T6-7 incomplete SCI from a fall at work; assets of $4400
4. A 36-year-old nurse diagnosed with MS, still working full-time at the university clinic; assets of $180,000

Living Expenses

Persons who have been employed prior to the development of disability have income options that those who have not worked cannot access. These include private disability insurance, Social Security Disability Insurance (SSDI), and Supplemental Security Income (SSI). The two programs covered by Social Security are designed to cover workers who cannot return to work under the guidelines of reasonable accommodation, as set forth in the ADA (https://www.ssa.gov/disability/).

- **SSDI** is available to workers with medically-determinable limitations that prevent them from working or participating in substantial gainful activity. The disability must last longer than a year or be predicted to result in death. In order to qualify, a worker will need to have worked five of the last ten years, paying FICA taxes during that time (https://www.ssa.gov/pubs/EN-05-10029.pdf).

- **SSI** benefits provide income to persons with limited income if they are over 65 or disabled, but are not tied to a work history (https://www.ssa.gov/pubs/EN-05-11000.pdf).

A unique paradigm exists for persons with disability who want to return to work. Until recently, if persons with disability returned to work, they would lose Social Security benefits and healthcare coverage. Private insurance is often unaffordable due to the disability.

The **Ticket to Work and Work Incentives Improvement Act of 1999** was passed to correct that problem. Amended in 2008, this law allows persons receiving support from Social Security to use a ticket to access vocational rehabilitation or other employment support services from an approved provider with the goal of achieving steady, long-term employment (https://www.ssa.gov/work/overview.html).
PASS (Plan to Achieve Self-Support) is another work incentive plan that maintains Social Security healthcare coverage while working. Under general SSI rules, a person’s SSI benefit is reduced according to the amount of other income. With PASS, the income set aside for PASS does not reduce SSI benefits (https://www.ssa.gov/disabilityresearch/wi/pass.htm).

The PASS program requires a work goal and a plan with costs that include those items that must be purchased in order to meet the work goal (training, testing, vehicle, computer, trade supplies, childcare, etc.). If income is to be set aside for the plan, SSI benefits may increase to help cover living expenses. Monies for PASS should be kept separate from other income; tracking of expenses and expenditures is required.

Not Enough $$$$  

Financial worries can have a crescendo effect on coping and health maintenance. If it is not managed, this effect can completely undo all the progress made through rehabilitation. Team members focused on discharge planning need to be proactive in pursuing sound management of the patient’s resources.

5. Identify a strategy you can incorporate into your care to reduce financial stressors.

Life Care Planning

One option for organizing funds for future care is life care planning. Life care planning involves development of an individualized plan that projects future needs and available funding in order to organize care, prevent complications, improve quality of life, and avoid crises in funding, function, or health.
Because many of those requiring rehabilitation will face lifelong limitations that influence their financial situation, life care planning can help to manage and protect assets. Provide care in a manner that proactively works to reduce physical, financial, and emotional burdens to caregivers, with attentiveness to services and quality.

Wirt & Porter, 2012

Of special note, when technology-dependent children were cared for at home, the cost of care declined and their psychosocial status improved.

Reimbursement in healthcare settings is directly tied to documentation of care. This documentation must accurately reflect the rehabilitative as well as the medical aspects of care. (The Rehab Nursing Series™ provides additional training on this topic in the course Not Documented? Not Done! Documenting Professional Rehabilitation Nursing Care. You can find information at www.rehabclassworks.com/Documentation.htm.)

On the computer: Complete the Principles & Philosophy quiz, page 47. Use the quiz to review material.

Then, read the next page in this workbook to start the next unit, Special Populations & Team Issues.
SPECIAL POPULATIONS & TEAM ISSUES

This unit of the workbook contains four chapters.

- **Rehabilitation Teams and Teamwork**  
  *(Domain III, Task 1: Collaborate with the interdisciplinary team)*

- **Improving Quality of Care**  
  *(Domain IV, Task 2: Use the nursing process to deliver cost-effective care)*

- **Growth & Development**  
  *(Domain I, Task 1: Use the nursing process to incorporate models and theories into practice)*

- **Impacts of Aging**  
  *(Domain I, Task 1: Use the nursing process to incorporate models and theories into practice)*

You may proceed in this order or select the chapter you prefer to study. There are matching chapters in the computer course for each of the workbook chapter titles above. Simply go to the correct page in each to pursue your selection.

*On the computer: Return to the Main Menu to start this unit, Special Populations & Team Issues, pages 1-2.*
Chapter 6

Rehabilitation Teams & Teamwork

Teams are complicated and dynamic, changing as their members mature and take on different roles. Membership on a team brings with it responsibility and accountability for cooperation, collaboration, and communication.

What Is Your Job in This Chapter?

You work with teams every day. Coordination and collaboration of team members facilitate faster goal

Chapter Highlights

- Rehabilitation team members should know each other’s roles and respect the skill and expertise of fellow team members.
- Multidisciplinary, interdisciplinary, and transdisciplinary teams are common in rehabilitation. Each of these types of team has its own strengths and limitations.
- There are many models of care delivery within which teams practice. Diagnosis-based, age-related, setting-centered, and provider-centered are a few examples. The continuum of care is used to provide care at the most cost-effective level.
- Case management improves the coordination of care and resources to support the best outcome for the patient.
achievement for patients. Your job in this chapter is to define characteristics of effective teams, to review the variety of team models used in rehabilitation settings, and to look again at the roles of various team members.

*On the computer: Special Populations & Team Issues, pages 3-14*

**Team Membership**

While teams are required by accrediting bodies and payers, their makeup and function vary from site to site. There are many types of teams found in rehabilitation settings. There are care delivery teams, project teams, quality improvement teams, etc. Whatever the team, its success is dependent on the commitment of its members to do the work of the team in a **collaborative** manner. Teams need to be flexible and creative as they work toward goals.

A successful team has:

- Clear goals
- Defined roles
- Clear communication
- Balanced participation
- Well-defined decision-making processes
- Established and communicated ground rules
- A plan for continued improvement and development

*Williams, 2015*

Teams providing rehabilitation care to patients are comprised of a variety of disciplines selected to work with a given patient according to that patient’s needs.
Complete the statements below with the name of the correct team member.

1. The ____________________________ focuses on the patient and his support system, often coordinating the discharge process. (two words)
2. The ____________________________ ____________________________ focuses on resocialization and diversional activities. (three words)
3. The ____________________________ counsels patients and families through adaptation.
4. The ____________________________ focuses on strength, range of motion, and functional mobility. (two words)
5. The ____________________________ is responsible for the medical management of the patient.
6. The ____________________________ assists patients in adapting to their environment and fosters successful independence. (two words)
7. The ____________________________ promotes the therapeutic milieu 24 hours a day. (two words)
8. The ____________________________ tests cognitive functioning and recommends remedial activities.
9. The ____________________________ is the most important member of the team.
10. The ____________________________ diagnoses and prescribes care for dysphagia problems. (three words)

Types of Teams

Caregiving teams in rehab settings tend to function in one of three ways.

Label each type of team.

11. ____________________________ Multiple disciplines working primarily on own area of focus and own area’s goals
12. ____________________________ Multiple disciplines working together for a common goal
13. Multiple disciplines working together, the majority acting as consultants to those providing care

Identify strengths and weaknesses for each type of team listed below.

14. Multidisciplinary:
   a) Strength:
   b) Weakness:

15. Interdisciplinary (also known as interprofessional):
   a) Strength:
   b) Weakness:

16. Transdisciplinary:
   a) Strength:
   b) Weakness:

The Continuum of Care

More and more frequently, care is provided in multiple settings. It is common that a liaison or case manager is used to facilitate the movement of the patient to the right level of care at the right time. (This behavior is actively driven by Medicare admission requirements for post-acute care.)
The more we utilize reimbursement patterns and continuums of care to manage the care of patients, the more likely relocation stress will occur. The team should be aware of the stresses placed on the patient and family when the setting of care is frequently changed and should make an effort to be flexible and avoid redundancy. The best method of care for this problem of **risk of relocation stress** is good planning and prevention.

Symptoms of relocation stress include:

- Apprehension, depression, or increased confusion
- Changes in sleep and/or eating patterns, or gastrointestinal disturbances
- Expressions of distress or need for excessive reassurance
- Vigilance
- Withdrawal

17. List three interventions that can prevent relocation stress from developing or diminish its effect.

Transitions across the continuum have received a great deal of attention due to historic inefficiencies and ineffectiveness caused by fragmentation of care, disorganization and limited handoff communication, duplicate effort, and regulatory requirements. A symptom of these issues is the high rate of readmissions. Thus, there are many quality initiatives in place today to address...
these issues, to reduce the numbers of readmissions, and to ensure the appropriate use of post-acute services.

Lutz, Camicia, & Farrell, 2015

Coordination of Care

The Commission on Accreditation of Rehabilitation Facilities (CARF) identifies expectations and requirements for the person who is accountable for coordinating the care of the person served.

18. Identify three behavioral expectations expressed by CARF for those coordinating the care of patients and their caregivers.

Case Management

Case managers may be internal or external. Their roles focus on strategies for coordinating care, managing resources, providing contacts to appropriate agencies, and advocacy. The American Nurses Association (ANA) definition of case management emphasizes the effort to meet the patient’s needs while decreasing fragmentation and improving cost-effective outcomes. The Association of Rehabilitation Nurses (ARN), ANA, and the Case Management Society of America (CMSA) define case management as a process. The CMSA has standards, just like ANA or ARN, that:

- Define the knowledge, skill, behavior, and practice of case managers
- Provide criteria for evaluation of practice
- Stimulate the development of the field
- Encourage research to further define and evaluate the field

Williams & Burnett, 2012; Williams & Doeschot, 2015
19. What is the purpose of case management?

20. When should an external case manager become involved in the patient’s plan of care?

21. Identify ways you can work with case managers to improve efficiency of care and outcomes for patients.

Goals

Patient and family goals should be developed with the patient/family or caregiver. After all, they are their goals. In order to do this successfully, patients and caregivers must be educated participants.

22. List characteristics of well-defined goals.

(The Rehab Nursing Series™ provides additional training on this topic in the course Got a Plan, Man? Patient-Centered Care Planning in Rehabilitation. You can find information at www.rehabclassworks.com/CarePlan.htm.)
Conflict

Conflict is common to all types of teams. Ineffective communication is often a contributing factor to conflict. Establishment of roles, goals, and processes is critical to preventing unnecessary conflict.

23. Identify one reason why conflict is positive for teams.

24. How can an issue of conflict be resolved?

Teams of the Future

Rehabilitation services, like many others, have benefited from the expansion of the internet and its related features and services. Nursing informatics is a recognized nursing specialty; it interfaces with the way we provide and deliver care every day.

Here are just a few of the impacts on the practice of the team.

- Access to information of all types is at our fingertips for patients, families, and team members.

- We transfer information to payers, regulatory bodies, quality agencies, research centers, and federal and state government in real time.

- Virtual support groups are a click away.
• Healthcare is safer, more efficient, more effective, timelier, and more reliable with the increased use of computer technology.

• Patient safety and monitoring have improved with the expansion of computer technology that monitors changes in performance, allows visualization from afar, and sends data regarding health indicators or function of medical devices.

• Technology has enabled increased quality of life and independence for those with disability.

• Teams are using computer technology and the internet for telemedicine and other new ways of doing business. Remote care is available with a web connection.

• Teams are using new technology to improve recovery or to restore function following disabling illness or injury.

• Genomic and stem cell research are rapidly developing alternatives for prevention and recovery.

Read the next page in this workbook to start the next chapter.
Chapter 7

Meeting Standards: Quality Improvement & Program Evaluation

Is the care provided by you and your team good enough for your own family?

What Is Your Job in This Chapter?

This chapter focuses on quality initiatives impacting rehabilitation services. Your job is to describe accreditation, quality improvement, and program evaluation processes influencing the work of rehabilitation nurses.

Chapter Highlights

- Public scrutiny and concern over quality issues has led to more intense efforts to control quality of care.

- Medicare and The Joint Commission require reporting of select data items to track quality of care and outcomes. This information is reported in a public report card.

- There are several processes common to the quality improvement initiative, such as PDCA and ASPIRE. Rehabilitation nurses should be actively involved in the quality process and know how to use quality tools.

- Rehabilitation nurses should understand levels of evidence and how to incorporate evidence-based care into practice.

On the computer: Special Populations & Team Issues, pages 15-25
Many different agencies and organizations define quality standards. Some are governmental agencies, such as CMS (Centers for Medicare & Medicaid Services) and state and local health departments. Others are national accreditation agencies, such as TJC (The Joint Commission) and CARF (Commission on Accreditation of Rehabilitation Facilities).

Consumer action groups (AARP) and professional associations (AMA, ANA, NDNQI) also make recommendations and monitor quality.

Quality

Accreditation agencies strive to improve the quality of care through the establishment of guidelines and standards. They seek to provide education to assist organizations in performance improvement. Accredited facilities are able to demonstrate their ability to meet national standards for organization and care.

1. What does CARF emphasize more than TJC?

Indicate whether the following statements are True or False.

2. ______ Medicare refuses to pay for select preventable complications in acute care.

3. ______ Pay-for performance initiatives are impacting reimbursement for healthcare.

4. ______ Public scrutiny of the provision of healthcare has expanded because of the ease of accessibility of information on the internet.

5. ______ Benchmarking is used to identify best practice.

6. ______ ASPIRE is a TJC guideline for quality improvement.
There are many tools and processes for addressing quality issues. The following questions are about quality tools.

7. What does PDCA stand for?

8. What are the principles of TQM?

9. Six Sigma uses a very structured process to improve quality and minimize variability in processes. What quality tool uses process mapping to focus on reducing waste through experimentation?

10. What quality tool would be used to show relationships between results and possible causes?

11. Which tool would be used to identify the most important problem to solve?

12. Which tool is a representation of a process?
Outcomes

Outcome data is collected at all levels of care. Quality is required for good outcomes, but other factors come into play as well.

13. What is measured by outcome data collection?

14. Is patient perception of satisfaction part of outcome evaluation?

15. What tool is incorporated into the IRF-PAI to measure function and burden of care?

16. What tool is based on the above tool and used to measure function in children?

17. What tool measures IADLs in older adults?

18. What tool is used by Medicare to collect outcome data on patients in home health settings?

19. Is there an expectation that those working in CARF-accredited settings know the results of outcome data assessment regarding the program they work in?
Evidence-Based Practice

Evidence-based practice (EBP) has penetrated all levels of care. Rehabilitation nurses should pursue and consider inclusion of evidence-based practice in the care of patients.

20. What is the definition of evidence-based practice?

Read the next page in this workbook to start the next chapter.
Chapter 8

Populations With Special Needs: Growth & Development

Rehab nurses are most effective when assessment, care planning, and goal establishment take into consideration the patient’s developmental level. This is particularly important when caring for children.

What Is Your Job in This Chapter?

Your job in this chapter is to understand developmental concepts and apply them to the care of children with disability. You should be able to match developmental tasks to appropriate age groups.

Chapter Highlights

- Growth and development are two distinct processes. Both require achievement of one level before another can occur.
- Development is definable, predictable, and sequential. Assessment of the child’s developmental level is important to determining care strategies.
- Erikson’s stages of psychosocial development and Piaget’s cognitive stages are two methods of addressing a child’s developmental level. Children should be approached according to the developmental stage in which they are performing.
- Disability impacts development and the entire family system. The rehabilitation nurse caring for children incorporates developmentally-appropriate interventions into care and involves the whole family.
Growth & Development

Growth results in an increase in body size, progressing to some point of optimal maturity. Development is a series of patterned changes that occur through life, resulting in new levels of maturity and integration of skills.

Development is critical to learning. No learning can occur unless a person is cognitively mature enough to understand consequences and change behaviors.

*Complete the following sentence.*

1. Developmental tasks are ________________, predictable, and ________________.

**Developmental Pattern**

Development follows a predictable pattern. Recovery from injury often follows these same patterns. There are times when growth and development are marked and rapid, such as during infancy and adolescence.

*Complete these phrases defining the pattern of development.*

2. Simple to ______________
3. ______________ to specific
4. _______________________: head to toe
5. _______________________: trunk to extremities

**Types of Development**

Development is dependent on growth and maturation.

*Complete these phrases regarding variation in development.*

6. A child who is learning to speak at an age-appropriate time is completing a _____________________________.
   (two words)
7. A child who has suffered a brain injury and is having difficulty with an age-appropriate developmental task due to the neurological injury is demonstrating _________________________. (two words)

8. A child who is behind peers in achieving a developmental task has _________________________. (two words)

**Developmental Tasks**

Developmental milestones are tasks most children are able to perform at a specific age. They are the foundation of many developmental assessment tools. A premature child's age should be corrected using the date on which the child should have been born rather than his chronological age. Developmental screening should be part of a child's preventive healthcare screen.

Care should be congruent with developmental level and psychosocial needs. This means functional skill expectations should not exceed developmental level.

*Identify the appropriate ages for each developmental task below.*

9. __________ Partially dresses and undresses; plays interactively

10. __________ Walks with one hand being held; throws objects

11. __________ Buttons clothing and dresses completely

**Erikson’s Psychosocial Development**

In this theory, a child must accomplish one stage to move on to the next.

*Identify the appropriate ages for the stages listed below.*

12. __________ Initiative versus guilt

13. __________ Identity versus role confusion

14. __________ Industry versus inferiority
Piaget’s Cognitive Stages

Piaget’s stages focus on assimilation of information and accommodation to change.

*Identify the appropriate ages for his stages.*

15. ___________ Formal operations
16. ___________ Preoperational thought
17. ___________ Concrete operations
18. ___________ Sensorimotor

Impact of Disability

Disability impacts the development of the child and the entire family system. Families also progress through developmental phases, which can be disrupted when there is a child with disability. Care of the patient must be combined with care of the family in all age groups, but it is particularly important to do so in pediatric care.

*List at least one intervention the team should incorporate into the care of a child at each developmental level.*

19. Adolescence:

20. Middle childhood:

21. Early childhood:
22. Toddlerhood:

23. Infancy:

Children’s needs are special, not because they have a disability, but because they must be supported through growth and development under the impact of the disability in order to maximize functional outcomes. This may require repeated and varied evaluation and adjustment as the child grows and matures.

24. What is the difference between habilitation and rehabilitation?

25. In order to anticipate care needs and develop preventive care programs, distinctions are made between acquired and congenital disability. Describe the difference between the two.
Special Issues: Healthcare

Chronic illness and disability make routine health maintenance and daily living much more difficult. Sometimes so much energy is spent in daily healthcare that preventive healthcare is overlooked. Children with disability or chronic illness have more visits to the doctor's office, more stays in the hospital, and more missed days at school than other children. Preventive care obviously can have a huge impact on quality of life, energy, cost of care, and general health of the child.

26. Identify three healthcare activities that should be supported in children with disability.

Special Issues: Functional Skill Development

Children learn through interactions with the environment and role modeling of those around them. Disability may have a significant impact on the child's ability to explore, experiment, and interact with the environment. Habilitation must accommodate for this limitation by developing alternative ways for the child to experience the environment and learn functional skills.

27. List the five key areas that should be addressed through rehabilitation or habilitation in order to facilitate the child's ability to reach maximum potentials.
Special Issues: Psychosocial

Children grow and mature emotionally as well as physically. The type and severity of the disability, as well as the family’s response to it, directly impact this development. In order to assist the child to reach optimal and healthy maturity, caregivers often need support, guidance, and encouragement in supporting psychosocial development.

28. List four skill areas that should be addressed and supported with caregivers.

Public Laws

Rights of children with disabilities have been protected through legislation. These laws have been important in establishing education as a right of all children. Services are available within the school system to facilitate inclusion in education, functional development, and healthcare management. Inclusion is a philosophical viewpoint supporting the integration of children with disabilities into playgroups, school, and other social activities.

List the key components of the following laws affecting children.

29. Public Law 94-142:
30. Public Law 99-457:

Identify the following terms.

31. IEP:

32. IHP:

33. ITP:

(The Rehab Nursing Series™ provides additional training on care of pediatric patients in the course Pediatric Rehabilitation. You can find information at www.rehabclassworks.com/peds.htm.)

Read the next page in this workbook to start the next chapter.
Chapter 9

Populations With Special Needs: Effects of Aging

A significant number of persons receiving rehab services are over the age of 65. Rehabilitation can make a considerable difference in their quality of life. Assessments should be done carefully in geriatric patients. Interventions should consider the effects of aging on therapeutic techniques.

What Is Your Job in This Chapter?

Your job in this chapter is to identify the psychosocial developmental tasks of adults and to describe physiological changes associated with aging.

Chapter Highlights

- An aging body brings its own set of parameters, requiring healthcare providers to adjust care strategies to accommodate variations in health.
- Adults pass through psychosocial stages of development. Families also have developmental stages. An assessment of development is needed at all ages and for all family groups.
- Rehabilitation nurses should know the parameters of normal aging so that they can monitor for adverse effects of medications and treatments.
Psychosocial Stages of Development

Adjustment to aging is an active process requiring accommodation and change. Erikson’s theory reminds us that developmental tasks of old age (ego versus despair) include finding meaning in age and accepting death as a part of life. We reflect on the lives we lived and are (hopefully) satisfied with our choices in life.

Havighurst, in his developmental task model, suggests that this includes:

- Adjusting to physiological changes
- Adjusting to retirement and new social roles
- Adjusting to the loss of spouse and friends
- Establishing affiliations with one’s own age group
- Establishing satisfactory living arrangements

Physiological Aspects of Aging

Decline and change in body function are normal parts of aging. However, these changes impact the way that older persons respond to injury and illness. Often symptoms are subtle and risks of complications are high.

Identify at least one change in each system.

1. Cardiovascular:

2. Hematological:

3. Renal:
4. Respiratory:

5. Sensory:

6. Gastrointestinal:

7. Endocrine:

8. Neurological:

9. Musculoskeletal:

10. Skin:

*On the computer: Complete the Special Populations & Team Issues quiz, page 48.*

*Then, continue to the next page in this workbook.*
PSYCHOSOCIAL ISSUES IN REHABILITATION

This unit of the workbook contains one chapter addressing the psychosocial issues pervasive in rehabilitation care. As you work your way through the chapter, pay close attention to the theories, nursing diagnoses, and care strategies for persons adjusting to disability. This is a lifelong adjustment process that crosses the continuum of care.

This chapter addresses the following categories.

- **Domain II, Task 7**: Use the nursing process to promote the individual’s optimal self-perception and self-concept.

- **Domain II, Task 8**: Use the nursing process to optimize individual role and relationship patterns.

- **Domain II, Task 10**: Use the nursing process to facilitate coping and stress management.

- **Domain II, Task 11**: Use the nursing process to support the culture, values, beliefs, and spiritual systems to achieve holistic wellness.

*Continue in the workbook to begin this unit.*

*When indicated to return to the computer, use the Main Menu and select Psychosocial Issues in Rehabilitation.*
Chapter 10

Psychosocial Issues in Rehabilitation

Adjustment to disability is a lengthy process and affects the entire family unit. Today, patients and families must begin to integrate health maintenance activities into a new lifestyle, often while they are still having difficulty believing what has happened to them.

What Is Your Job in This Chapter?

Your job in this chapter is to review key theories related to coping and adaptation to disability.

On the computer: Psychosocial Issues in Rehabilitation, pages 1-19

Chapter Highlights

- Society’s attitudes influence the care provided and the responses to disability. Be attentive to these influences on care delivery.
- Wellness theories can be used to assess a patient’s or a caregiver’s approach and response to the situation that requires rehabilitation care.
- Patients adapt to changes brought on by disability, progressing through phases of reacting to the initial impact, mobilizing defenses, realizing the significance of the situation, retaliating, and reintegrating into society.
- The rehabilitation team must support the patient and family caregivers in the community to prevent burnout.
How many times have you said, "I hope that never happens to me!"? Attitudes toward the disabled have changed a great deal over the last several decades, especially if your disability is one that does not impair your ability to communicate or leaves you looking physically whole or normal.

Every person working in a rehabilitation setting needs to think carefully about how they really feel about disability. Our attitudes send a quiet undercurrent of values and beliefs to our patients. This message affects the patient's self-image, the family's responses, and our ability to provide the best possible care. Our attitudes influence whether we treat the patient and family in a paternalistic or empowering manner, whether we feel sympathy or empathy, how strongly we support community reentry or institutionalization, and how creative we are in assisting a patient or family in meeting their goals.

1. What are YOUR attitudes toward those with disability?

2. How do attitudes of family and friends impact a person’s response to disability?

3. What might you expect to be common concerns of children facing an acquired disability?
Mind, Body, & Spirit

Survival and coping skills need to be developed early in the care process. Patients and caregivers should have many opportunities to anticipate and plan for their future.

4. The rehab team should support coping and the development of resilience. What is resilience?

Spiritual Distress

A holistic view of the person with a disability requires reflection on his or her spiritual needs. Disability causes such severe stress that the patient’s and family’s entire underlying belief system may be disrupted. The rehabilitation nurse should be prepared to support patients and to address issues of spirituality. Assessment and intervention should occur early in the care process to provide support to the patient and family system.

5. List three questions you may ask your patient to determine whether the patient has need of spiritual support.

6. Identify three strategies you can use to prepare yourself to assist your patients in meeting their spiritual needs.

Persons Who Adapt…

Persons who adapt demonstrate:
- Less psychological distress
- High use of problem-focused coping strategies
- Belief in personal control over health outcomes
- Higher perceptions of quality of life and overall life satisfaction
- Lower perceived functional limitation
- Higher perceived levels of spiritual well-being

Livneh, Lott, & Antonak 2004
7. Identify at least three interventions you can use if your patient is in spiritual distress.

**Complementary & Alternative Medicine**

The term *integrated medicine* refers to the incorporation of CAM into conventional medicine based on evidence. It is fast and easy for most patients/caregivers to find both reliable and unreliable information on complementary therapy. If you have access to the internet, you have access to information. Health literacy is an important concept of making wise choices in the use of CAM.

8. Go to National Center for Complementary and Integrative Health (NCCIH) at [https://nccih.nih.gov/](https://nccih.nih.gov/) to research several herbal products such as cranberry, aloe, echinacea, ginseng, and melatonin, and complimentary therapies such as Reiki and acupuncture. What did you learn?

**Psychosocial Assessment**

The onset of an acquired disability usually is sudden and overwhelming. Common problems associated with this include anxiety, powerlessness, loss of self-esteem, and alterations in body image, roles, and relationships. The patient’s and the family’s ability to cope is significantly stressed, but it is pivotal to adaptation and adjustment to disability.

9. Identify at least three components of a psychological coping assessment.
10. Identify at least three components to address when assessing community resources.

The Process of Change

Change is constant in rehabilitation care. Activities that facilitate change mirror the nursing process, with continuous evaluation of progress and tweaking of interventions. Change activities impact the rehabilitation team as much as it does the patients who are adjusting to a new and different lifestyle. Fear, fatigue, and pursuit of comfort actively impact one’s movement through the change process.

Jernigan, 2015

Lewin's classical change theory identifies forces and movement patterns that influence readiness and participation in change. In order to help the patient successfully navigate these phases, the nurse must function as a change agent.

*Match the correct phrase with the change theory term.*

<table>
<thead>
<tr>
<th>unfreezing</th>
<th>movement</th>
<th>refreezing</th>
</tr>
</thead>
<tbody>
<tr>
<td>driving forces</td>
<td>restraining forces</td>
<td>change</td>
</tr>
</tbody>
</table>

11. _________________ Occurs when one force outweighs the other
12. _________________ Movement into a state that is amenable to change
13. _________________ Stabilization of new learning
14. _________________ Goals are established and actions taken
15. _________________ Forces that inhibit the change process
16. _________________ Forces that facilitate the change process
Adapting to Disability

The sudden onset of disability disrupts all aspects of a family and an individual’s life. Persons with support systems, spiritual well-being, and a sense of purpose in life adapt better than those without. Rehabilitation care providers should actively recruit these coping mechanisms to facilitate better patient outcomes for patients.

17. Which of these factors do you think are likely to impact a person’s adaptation to disability?

___ Type of disability  ___ Nature of onset
___ Pre-disability personality  ___ Cultural identity
___ Social environment  ___ Perception of current abilities

Initial Impact

Shock and anxiety are obvious during this phase. Anxiety is defined as a vague feeling of apprehension and uneasiness due to a threat to one’s value system or security pattern. It ranges from mild to panic levels.

Nursing Diagnosis: Anxiety

Remember that anxiety has a significant impact on cognitive functioning.

- Difficulty concentrating
- Decreased awareness of environment
- Forgetfulness
- Rumination
- Focus on past rather than on present or future
- Blockage of thoughts or memories
- Hypervigilance

Anxiety

Anxiety is a self-protective mechanism that occurs when self-esteem is threatened.
18. Identify at least five **physiological** symptoms of anxiety.

19. Identify at least five **emotional** symptoms of anxiety.

20. Try a little deductive reasoning. What happens to a person who has damage to the emotional centers of the brain and never experiences anxiety?

21. Identify interventions for anxiety.

22. List at least three symptoms of PTSD.
Nursing Diagnosis: Fear

Fear can exist without anxiety and anxiety can exist without fear, but they may coexist. For instance, a stroke patient may be fearful of another stroke and be anxious about his ability to get along at home. Fear may be related to the perceived effects of the loss of function, the loss of control associated with hospitalization or disability, loss of income, or loss of relationships, among other things.

23. What interventions would you use with a patient who was fearful of suffering another stroke?

24. Do you have fear or anxiety about the certification exam? What self-care intervention will you use?

Defense Mobilization

Defense mobilization is a protective mechanism of bargaining and denial. The patient may exhibit behaviors that are unrealistic and falsely positive in an attempt to protect him from threats. Some typical behaviors demonstrated at this time are:

- Poor comprehension or memory of information
- Unrealistic expectations regarding medical and rehabilitative interventions
- Resisting community reentry activities
- Unwillingness to participate in therapeutic activities
- Evading future planning
Interventions must focus on providing support, education, and more support as the patient (and family) eventually faces reality.

25. What response is most therapeutic for a patient who continues to tell you that he does not need to learn about self-care because he will get better soon and will be walking out the door, in spite of what you and the rest of the team may think?

**Initial Realization**

As recognition of reality dawns, mourning and depression may become evident. Internalized anger over the situation and the events causing it are common. Symptoms of depression appear. Expressions of internalized anger may include:

- Self-abuse or injury
- Suicidal ideation
- Passive-aggressive behavior
- Argumentative responses

**Nursing Diagnosis: Grief**

Denial, anger, bargaining, depression, and acceptance are considered the five stages of grieving. However, many have challenged the concept of acceptance for anyone with chronic illness or disability, feeling that success is possible without acceptance. A patient who is experiencing grief may demonstrate denial, guilt, anger, despair, crying, sorrow, delusions, phobias, suicidal thoughts, difficulty concentrating, longing, and searching behaviors.
Nursing Diagnosis: Powerlessness

Powerlessness occurs when a patient perceives a lack of personal control over events or situations. It can contribute to apathy and helplessness. It may be impacted by the patient's locus of control. It may also impact the patient's willingness to learn and use information to problem-solve.

26. Describe a patient who is demonstrating powerlessness.

27. Why is it important for nurses and other team members to coordinate care when addressing powerlessness?

Nursing Diagnosis: Body Image Disturbance

This nursing diagnosis is defined as a disruption in the perception of one's body image. It is a common problem for our patients and can lead to a feeling of hopelessness and vulnerability. These feelings and attitudes may be reinforced by interactions with others.

28. Identify at least three interventions you can take in your daily care for patients who have a body image disturbance.
Nursing Diagnosis: Self-Esteem Disturbance

This general diagnostic category is common to the population of rehab patients. Patients who are expressing shame, guilt, or negative comments about themselves also may have difficulty setting goals and making decisions. This may be an episodic or a lifelong problem. Counseling is recommended for patients with chronic problems.

29. Identify three specific interventions you would use with a patient demonstrating an episodic self-esteem disturbance.

Retaliation

Energy levels increase when patients reach retaliation. As alternative coping strategies are used, caregivers often feel personally offended and complain that the patient is noncompliant. Instead, there should be some celebration and understanding that this is movement, because in order to be angry, you must be engaged. And once you are engaged, the potential for problem solving exists.

30. Identify interventions you would use to channel the energy of a patient who is firing staff and complaining that no one can do a decent job of meeting his needs.
Reintegration

With reintegration comes an understanding of the situation and its implications. A new self-concept is formed, and there is a willingness to socialize. Interventions focus on supporting the patient’s independence and assisting with adaptation and problem solving in the patient’s environment. Physical modification of the environment may be necessary to support the patient’s efforts. Vocational interests may increase.

Nursing Diagnosis: Ineffective Management of the Therapeutic Regimen

This nursing diagnosis is useful for the patient who is having difficulty integrating newly-learned behaviors or who is at risk of being overwhelmed by the complexity of care.

Herdman & Kamitsuru, 2014

Unscramble the letters to identify factors that contribute to this diagnosis.

31. ____________ (trmoo) skill deficit
32. Inability to ______________ (cseacs) the healthcare system
33. Non-therapeutic ____________________________ (psreatloinh) with healthcare providers
34. Inadequate __________________ (gfnuidn)
35. Lack of ______________________ (ctiaeduon)
36. Decreased __________ (elsf)-______________ (etmese)

Listed below are suggested categories of interventions for this nursing diagnosis.

- Identify who is responsible for health management.
- Provide appropriate education.
- Minimize dependency and sick-role behaviors.
- Foster self-reliance and wellness.
- Refer to appropriate community resources or support groups.
Nursing Diagnosis: Risk for Loneliness

Loneliness is perceived as being imposed by others and is related to fears of rejection, difficulty accessing social activities (due to healthcare needs, limitations in mobility, transportation, funds, etc.), and personal and environmental situations. A person with loneliness has feelings of emptiness and may find it hard to access human contact and maintain healthy relationships.

37. Identify three interventions you would use for a patient who is at risk for loneliness.

Nursing Diagnosis: Noncompliance

Noncompliance describes the patient who desires to comply, but is limited in doing so by pathophysiological (e.g., disability, advancement of disease process), treatment-related (e.g., side effects, previous experiences, finances, environment), or situational (e.g., barriers to access, functional deficits, lack of support) barriers. This should not be confused with the patient who purposely chooses to not participate in recommended care.

38. What interventions should be used with a patient demonstrating noncompliance?

Alterations in Family Processes

Our sense of who we are and what we are is related directly and significantly to our relationships with others, our role in life, and our values, beliefs, and culture. The impact of disability and chronic illness is enormous, and role changes are stressful and difficult. Family life cycle theories such as Duvall’s and Stevenson’s describe the stages of family development (e.g., caring for infants, launching young adults, etc.). These stages are also disrupted by disability.
Impairments may occur in family maintenance, the division of labor, and the ability to meet emotional needs, to communicate, and to socialize. Key concepts of family systems theories focus on the family's ability to adapt and reshape itself. Family systems are open or closed.

- **Open**: Family adapts and copes by realistically acknowledging change; rules permit growth and adaptation.

- **Closed**: Change is handled through attempts to maintain the status quo.

Key concepts related to the family's adaptation are:

- Communication systems
- Education (knowledge is power)
- Prior history of coping
- Support systems

Persons who are having difficulty with adaptation may continue to be dependent in self-care and health maintenance, have problematic social relationships, and seldom successfully return to work. Resentment may be obvious and a cycle of interpersonal dependency and control can persist.

Equally problematic are patients who are inappropriately independent. They overestimate their abilities and take risks that impair their safety.

The education and interaction shared by the rehab team with the patient and family highly influence the perceptions and behaviors of the family system. Equally important to this relationship are the response patterns of the patient and family that provide feedback to the team and influence the team’s approaches and interactions. An understanding of family dynamics can facilitate interventions and avoid creating difficult situations.

Reintegration results in a reestablishment of roles and relationships, increased self-reliance, and a balance of dependence and independence. Support groups facilitate this reintegration by:

- Providing a forum for sharing experiences and problem solving
- Proving a safe place for the expression of frustrations and fears

---

**Success**

Successful adaptation requires communication, re-establishment of socialization patterns, and a balance between dependence and independence.
Care of the Caregiver

The number of family caregivers is enormous. The tolls and strains that this role places on the person and the family system are just now being documented. It is not surprising to learn that family caregivers have increased stress and increased health problems that are directly related to failing to care for themselves while they are busy providing care for a loved one 24 hours per day, 7 days per week. Respite care can reduce stress and facilitate self-care, but it is often not pursued or not available.

39. List three things you should teach caregivers, prior to discharge, to help prevent burnout.

(The Rehab Nursing Series™ provides additional training on psychosocial issues and adaptation in the course Down, Not Out! Providing Psychosocial Support in Rehabilitation. You can find information at www.rehabclassworks.com/psych.htm.)


Then, read the next page in this workbook to start the next unit, Community Reentry & Education.

Core Curriculum supporting pages: 11, 150-161, 224-226, 291, 303-313, 403-430
COMMUNITY REENTRY & EDUCATION

This unit of the workbook addresses **Domain III, Task 2**: Use the nursing process to promote community reentry and integration. It contains two chapters.

- **Patient & Family Education**
- **Community Reentry**

You may proceed in this order or select the chapter you prefer to study. Simply go to the correct page in each to pursue your selection.

*On the computer: Return to the Main Menu to start this unit, Community Reentry & Education, pages 1-2.*
Chapter Highlights

- Patients and their caregivers must learn a great deal about self-care. Psychosocial adaptation can interfere with readiness to learn.

- Rehabilitation team members need to learn to be effective teachers. It is important to really understand the burden of being a 24-hour caregiver every day.

- Team members should coordinate and collaborate in educational efforts in order to provide consistent information. Variations in messaging and training interfere with learning and compliance to recommended care strategies.

- Knowles’ principles of adult learning can be helpful in developing educational strategies. Address first what your learner wants to know.
What Is Your Job in This Chapter?

Your job in this chapter is to review strategies to enhance patient and family education, to describe how psychosocial stress can interfere with learning, and to review domains and theories of learning. As you review this information, identify strategies for improving the efficiency and effectiveness of your education efforts.

Rehabilitation nurses are involved in prevention of injury or illness, prevention of complications following disability, and promotion of health. This is the primary purpose behind education. Here is a quick review of levels of prevention.

- **Primary prevention** includes health-promotion activities directed at preventing a problem or complication, or improving a situation already present.
- **Secondary prevention** includes early diagnosis and treatment in an effort to limit the consequences of a disease or injury.
- **Tertiary prevention** includes activities that promote recovery, restoration, and rehabilitation following a disabling event, enhancing quality of life.

Farrell & Raptosh, 2012

On the computer: Community Reentry & Education, pages 3-12

Assessing Readiness to Learn

Effectiveness of teaching depends on the learner’s readiness to learn. This is a key component of the education process, according to TJC. How can you tell when the patient is ready and motivated to learn? One person cannot motivate another. The best we can do is to provide the environment and the opportunity for the other person to motivate himself.

- Generate a need.
- Establish a sense of personal responsibility.
• Be interesting and relevant.
• Provide feedback.
• Establish goals.

1. What is the one most important thing you can do to increase the patient’s readiness to learn?

Knowledge Deficit
The majority of our patients have a knowledge deficit of some type. Individual learning preferences should be taken into consideration when planning interventions. Education should be presented at the developmental level of the learner. Particular care should be given to elderly caregivers to accommodate potential memory or sensory impairments, potential visual or auditory limitations, and the caregiver’s own healthcare needs.

Teaching
Teaching takes advantage of spontaneous moments in which the patient/caregiver is ready to learn. Though unscheduled, this is a planned and organized component of care.

• What are the learning objectives? What should the patient/caregiver be able to do or know on completion of the teaching?
• What resources are available to facilitate teaching and learning?
• Where do the teaching activities occur? Is it conducive to learning?
• Who will be taught what?
• How will you know that the learner has learned what was taught?
Group and individual learning activities are used to educate patients and families. Each has its advantages and disadvantages.

**Group**

- **Advantages:** social support available; can address a larger number of persons at one time
- **Disadvantages:** less one-on-one interaction and clarification; some participants may be afraid to ask questions

**Individual**

- **Advantages:** can be more personal and specific to needs; easier to evaluate understanding
- **Disadvantages:** can take more time and cost more

In order to determine which approach is best, evaluate the learning needs and outcomes expected, and identify which process will most efficiently and effectively achieve the outcomes intended.

2. Identify key concepts of Knowles’ andragogical model of adult learning.
Learning domains should also be considered when planning strategies for teaching.

3. Describe the affective, cognitive, and psychomotor components that should be included when teaching self-medication administration.

Objective evaluation of learning through the use of tools such as teach-back is the key to determining what actually has been learned and whether the information can be transferred into the real world. This also means objective documentation of responses: the wife states she understands how to administer the medication versus the wife demonstrates setting up and administering of medications and correctly answers questions about side effects.

The final evaluation of the effectiveness of teaching revolves around the ability of the patient/caregiver to retain information and incorporate it into daily routines and lifestyle. There are several components in this evaluation.

- Assessing the patient/caregiver’s ability to incorporate newly-learned skills and information over time to determine adherence to health promotion and safety behaviors
- Identifying and addressing barriers or causes of nonadherence
- Facilitating critical thinking and problem-solving skills to support early management of potential problems in the community

(The Rehab Nursing Series™ provides additional training on this topic in the course See One, Do One... Patient & Family Education in Rehabilitation. You can find information at www.rehabclassworks.com/PtEd.htm.)
Compassion Fatigue

Caregivers vested in the care of the patient are at risk for compassion fatigue. The empathy, concern, and caring they want to provide place them at risk, leading to a state of exhaustion and dysfunction. Risk increases with isolation and the level of personal demands. Prevention focuses on balance, respite care, quality sleep, exercise, and good self-care. Nurses can develop this condition as well as family caregivers.

On the computer: Complete the Test Your Knowledge exercise, page 13.
Then, read the next page in this workbook to start the next chapter.

Core Curriculum supporting pages: 116-123, 333-336
Chapter 12

Community Reentry

Community reentry requires planning, risk taking, and problem solving. Practical aspects often are much easier to address than the changes in attitudes.

What Is Your Job in This Chapter?

Your job in this chapter is to identify skills and resources needed by patients when they return to community living. You are invited to experience the transition to community living through the eyes of Katy and to learn from her experience how to support community reentry activities.

On the computer: Community Reentry & Education, pages 14-21

Chapter Highlights

- Discharge planning should consider transitions to the next level of care and should provide opportunities for practicing needed skills. It starts on admission!
- All inpatient rehabilitation team members should understand the basics of a home assessment and should address and reinforce safety issues.
- Barriers to access in the community occur in the home and potentially in any area of the community. Legislation has improved access but has not removed barriers. Reinforce safety considerations when problem-solving barriers.
- Rehabilitation nurses must be aware of changes in technology, populations, regulations, legislation, and social constructs affecting care.
Taking a Look at Discharge

After a considerable amount of hard work and significant amounts of planning, patients in inpatient settings return to the community.

This return to real life is both a celebration and a challenge. Barriers are everywhere: housing, accessibility, finances, access to healthcare, transportation, employment, and recreational activities. When possible, preparations for discharge should include community outings and opportunities to test skills in the home environment. Success may be dependent on skill development and access to appropriate support resources. Education, training, and good problem-solving skills are the best tools for reentering the mainstream of society.

Additional information for home safety can be found at these websites:

- [https://www.traumaticbraininjuryatoz.org/TraumaticBrainInjuryAtoZ/media/TraumaticBrainInjuryAtoZ/Sections/P5-TheCaregiversJourney/Mod3-12_HomeSafetyChecklist.pdf](https://www.traumaticbraininjuryatoz.org/TraumaticBrainInjuryAtoZ/media/TraumaticBrainInjuryAtoZ/Sections/P5-TheCaregiversJourney/Mod3-12_HomeSafetyChecklist.pdf)

Introduction to the Community

Therapeutic community tasks are addressed by various team members. Some organizations utilize a special community skills therapist with an OT, PT, or recreational therapy background. Others send patients with family members to complete tasks and assess for success or problem areas. The method is variable. The experience is invaluable. Coverage by insurance companies is variable, which often determines the depth of this experience for patients. (While this is a valued practice in rehabilitation care, insurance companies may not support the activity. Therefore, it must be used selectively, and the therapeutic value must be documented.)
See the Rehab Nursing Series™ course Got a Plan, Man? Patient-Centered Care Planning in Rehabilitation course at www.rehabclassworks.com/CarePlan.htm for more specific information regarding the use of therapeutic community passes to improve discharge planning.

Accessibility & Going Home

Successful community living requires housing, transportation, self-care, and access to necessary supplies. Resources should be assessed and investigated to identify how to most effectively meet needs of care without undue burden on the family system. Community access should be assessed for barriers to roles and community living.

It is common for persons with disability to have difficulty accessing information on disability-related services and legal rights; services for mental health, medical care, and case management; and support for instrumental activities of daily living (e.g., shopping, doing laundry, etc.).

Mauk & Radwanski, 2015b

An accessible community allows those with disability to be able to participate in their roles in life. Regaining function itself is not rehabilitation; it has to be applied to life and lifestyles.

1. Identify four areas of a home that need to be assessed for community living.

2. Identify four community-level self-care activities.
Many persons with disability require the use of a wheelchair for mobility in the home and/or the community. When a person spends a great deal of time in a wheelchair, it is important that it is fitted appropriately to reduce the risk of skin problems and musculoskeletal discomfort from poor positioning. The correct type of chair should be selected to maximize mobility and reduce the risk of wear-and-tear injury of the arms that can occur with extensive use.

**Fitting a Wheelchair**

- Seat height from the floor, determined by measuring the length of the leg from the bottom of the heel to the popliteal fold, is important if the patient will be self-propelling, and for safety and effectiveness performing transfers.

- Appropriate seat depth, measured from the popliteal fold to the back of the buttocks, provides appropriate support and prevents pressure at the back of the knee.

- Standard back height of wheelchairs is measured from the bottom of the buttocks to the scapula. Sports and active chairs generally have lower backs. Patients with posture and balance problems require higher backs.

- The armrest is positioned to support the arm in neutral position, measured from the bottom of the buttocks to the bottom of a flexed arm in a relaxed position.

- Adequate width prevents pressure areas from developing. It is determined by measuring the widest part of the hips.

Additional features may be added to the wheelchair to maximize function and promote safety, such as anti-tip bars (particularly when first learning to negotiate community hazards) and type/placement of wheels.

3. List five pieces of adaptive equipment, besides a wheelchair, which can enhance independence in the home.
4. Identify four safety measures for cognitively-impaired persons in the home.

5. List at least three issues related to emergency safety that should be addressed prior to community living of patients with significant disability.

Return to Work

Vocational rehabilitation is a valuable service for persons with disability who want and need to be employed.

- Adolescents are provided a comprehensive transition plan regarding services and support needed for postsecondary education, job training, and community living as a requirement of the Individuals with Disabilities Education Act of 1997.

- Adults who have sustained a disability may need vocational counseling and job retraining in order to return to employment. Vocational rehabilitation services are governed by many laws and supported by federal monies to assist the person with disability in this transition.

Diversional Activity Deficit

What an unbalanced life we would lead without recreational activities! A key benefit of recreational activities can be their ability to support the patient in his efforts to reestablish himself as an active, competitive person. Participation in recreational activities depends on the interest, functional skills, and financial resources of the patient.
6. What is the first thing you would assess regarding diversional activity?

7. List three adapted sports/recreational activities available in your community.

More information on community living with disabilities can be found at these websites:

- https://www.dol.gov/odep/topics/disability.htm
- http://www.makoa.org/

On the computer: Complete pages 22-23. Use the Yellow Brick Road exercise and Community Reentry & Education quiz to review material.

On completion of the quiz, go to the next page in this workbook to start the next unit, Anatomy & Physiology Review.

This unit of the workbook contains one chapter and discusses physiology issues common to rehabilitation care. It addresses the physiology aspect of Domain II (Functional Health Patterns).

As you work your way through this chapter, think about the impact that different illnesses and injuries common to rehabilitation settings have on the body systems. Consider how an impact on one system can have a direct impact on another. Successful rehabilitation care strategies balance all systems for best outcomes.

On the computer: Return to the Main Menu to start this chapter, Anatomy & Physiology Review, pages 1-2.
Chapter 13

Anatomy & Physiology Review

A basic understanding of normal physiology allows deductive reasoning to assist in understanding pathological disease processes.

What Is Your Job in This Chapter?

Your job in this chapter is to review normal functioning of the body systems such as the neurological, cardiac, respiratory, GI, and GU systems in preparation for applying this information to the problems that commonly occur in rehabilitation patients.

Chapter Highlights

- Knowledge of neuroanatomy facilitates understanding of the impact of neurological injury and disease.
- Review function of the cardiopulmonary systems. Their dysfunction may be primary or secondary causes of the need for rehabilitation.
- Genitourinary and gastrointestinal dysfunctions are common in rehabilitation patients. Knowledge of normal function facilitates effective application of interventions that normalize the function of these systems.
- Relate the content of this chapter to the diagnoses of your patients so that you can make correlations between function and injury.
An understanding of sensory inflow, motor control, and cognitive process is essential to management of patients with neurological diseases.

As significant portions of rehab patients suffer from neurological diseases or injuries, you should be very familiar with the functioning of the central nervous system. If you need a more in-depth review of this material, access your favorite physiology text.

On the computer: Anatomy & Physiology, pages 3-26

The Brain Puzzle

Start this review with a trip through the brain. A great deal of information is processed in our brains. Stroke and other forms of brain injury impact brain function in a variety of ways.

Right or Left?

An understanding of hemispheric function helps to explain the changes that occur with brain function following stroke. Remember that, generically, the right side of the brain controls the left side of the body, and the left side of the brain controls the right side of the body. Some other functions are more heavily managed by one side of the brain or the other.

Identify which of the following activities are left brain activities and which are right brain activities by putting an R or an L in front of each.

1. _____ Speech and language
2. _____ Left/right discrimination
3. _____ Constructional skills
4. _____ Analytical reasoning
5. _____ Proprioception
6. _____ Spatial perception
Brain Strain I

The brain is further divided into lobes. Each lobe has a particular focus. But make no mistake, they are highly integrated!

7. Label each lobe of the brain in this picture.

---

You reviewed the activities associated with different lobes of the brain in the exercises in the computer course. What do you remember?

*Identify the lobe of the brain associated with each activity. Your choices are:*

- frontal lobe (F)
- parietal lobe (P)
- temporal lobe (T)
- occipital lobe (O)
- cerebellum (C)

8. _____ Executive functioning
9. _____ Recognition of objects
10. _____ Body awareness
11. _____ Reception of sensory impulses
12. _____ Screening out unnecessary stimuli
13. _____ Interpretation of the sensations of touch, pressure, temperature, and pain
14. _____ Location of memorized patterns of movement
15. _____ Initiates voluntary movement
16. ______ Seat of personality
17. ______ Spatial relationships
18. ______ Speech motor area in the left hemisphere
19. ______ Interpretation of balance
20. ______ Control of the amount of muscle tone
21. ______ Concentration
22. ______ Complex problem solving
23. ______ Logical thinking
24. ______ Abstract thinking
25. ______ Future planning
26. ______ Voluntary muscle coordination
27. ______ Interpretation of visual information
28. ______ Complicated math problems
29. ______ Recognition of the meaning of written words
30. ______ Recognition of tones, loudness, and qualities of sound
31. ______ Interpretation of the meanings of spoken words
32. ______ Modifies speed, force, and accuracy of movement
33. ______ Storage of short-term memory

**Brain Strain II**

The internal structures of the brain control many important areas of the brain, screening information, modulating body functions, and fine-tuning outgoing messages. Check your memory again...
Identify the internal structure of the brain associated with each activity. Your choices are:

- hypothalamus (H)
- basal ganglia (BG)
- thalamus (T)
- limbic system (LS)
- internal capsule (IC)
- medulla (M)
- pons (P)
- reticular activating system (RAS)

34. _____ Contains centers that work with the hypothalamus to control body temperature
35. _____ All motor fibers converge here
36. _____ Affects motivation and attention
37. _____ Secretion of antidiuretic hormone
38. _____ Contains the respiratory center that establishes rhythmic breathing and increases ventilation when CO₂ level increases (chemical receptors sensitive to CO₂)
39. _____ Satiety center
40. _____ Cranial nerves originate here
41. _____ Important in the storage of memory
42. _____ Contains vasodilation and vasopressor centers
43. _____ Initial recognition of sensory information: pain, touch, and pressure
44. _____ Smooths out movement and makes postural adjustments
45. _____ Regulation of vegetative functions via control of the autonomic nervous system
46. _____ Works with the hypothalamus and autonomic nervous system to regulate hunger, thirst, and sleep/wake patterns
47. _____ Helps maintain biorhythms
48. _____ Contains swallowing and vomiting centers
49. _____ Relay station for sensory information, routing to correct area of the brain
50. ______ Injury to this area may result in hyperarousal
51. ______ Differentiates pleasant from unpleasant feelings
52. ______ Active in controlling levels of consciousness, damage results in coma; major role in attention and concentration, establishes selective attention
53. ______ Contains the apneustic center (initiates inspiration) and the pneumotaxic center (inhibits inspiration)
54. ______ Testing for damage to the area includes testing the oculocephalic (doll's eye) and oculovestibular (caloric) reflexes
55. ______ Important role in primitive behaviors: fight, flight, food, and sexual arousal
56. ______ Injury in this area will result in rigidity and bradykinesia

**Brain Strain III**

Damage to cranial nerves can result in significant safety issues.

*Match these nerves to their numbers and functions.*

<table>
<thead>
<tr>
<th>Name</th>
<th>Number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>accessory</td>
<td>______</td>
<td>Vision</td>
</tr>
<tr>
<td>glossopharyngeal</td>
<td>______</td>
<td>Smell</td>
</tr>
<tr>
<td>olfactory</td>
<td>______</td>
<td>Motor control for chewing</td>
</tr>
<tr>
<td>optic</td>
<td>______</td>
<td>Motor and sensory for heart, lungs and digestion</td>
</tr>
<tr>
<td>trigeminal</td>
<td>______</td>
<td>Motor to pharynx, larynx, and trapezius</td>
</tr>
<tr>
<td>vagus</td>
<td>______</td>
<td>Motor and sensory to the pharynx, back of tongue</td>
</tr>
</tbody>
</table>

**Accessing the nerve functions:**
- **Accessory**: Motor to pharynx, larynx, and trapezius
- **Glossopharyngeal**: Smell
- **Olfactory**: Vision
- **Optic**: Motor and sensory for heart, lungs and digestion
- **Trigeminal**: Motor control for chewing
- **Vagus**: Motor to pharynx, larynx, trapezius
Go With the Flow

Oxygenation of the brain is critical to brain function.

63. Circle the correct choice: The primary regulator for blood flow to the brain is (carbon dioxide/oxygen).

64. Identify the anterior cerebral arteries and posterior cerebral arteries on this picture.

65. What is the purpose of the Circle of Willis?

Head Bone’s Connected to the…

Spinal nerves exit between each of the vertebrae. These nerves are labeled in relationship to the area of the spinal column where they exit. However, there is not a direct correlation between each nerve and each vertebra.

66. Where are the discrepancies?

In Control

Spinal nerves innervate specific muscles and organs.

67. Which spinal nerve innervates the hand, allowing hand flexion: C6, C7, C8 or T1?

68. Which nerves supply the bowel, bladder, and sexual organs?
69. Which nerves supply the diaphragm?

70. Which spinal nerve innervates the hand, allowing hand function with thumb opposition: C6, C7, C8 or T1?

**In or Out?**

Motor neurons travel from the brain down through or in the spinal column, where they relay information to the peripheral nervous system outside of the spinal column.

*Describe the following terms.*

71. Upper motor neuron:

72. Lower motor neuron:

**Cross Tracts**

*Motor nerve tracts* descend the spinal cord; sensory nerve tracts ascend it. Motor nerve tracts include the lateral corticospinal, the ventral corticospinal, and the extrapyramidal.

*Sensory nerve tracts* include the anterolateral (pain, temperature, crude touch, tickle, itch, and sexual sensations) and the posterior (dorsal) column or medial lemniscal system (tactile, vibratory, and proprioceptive sensation). The anterolateral tract crosses in the spinal cord; the posterior column crosses in the medulla.
Reflexively Speaking

Many responses and functions of the body (such as maintaining posture and protective mechanisms) are dependent on reflex actions.

73. Describe a simple reflex arc.

Assessment

Common language when assessing a patient’s strength or reflex response is important to good communication. You are likely familiar these terms. If not, find which rating is normal and work your way through the options from there.

- **Muscle strength** is scored from none to best.

- **Reflexes** are scored from hypo to hyper.

*Match the definition with the score.*

**Muscle Strength or Grade:**  1  2  3  4  5

74. _____ full ROM, gravity eliminated

75. _____ no contraction

76. _____ full ROM against gravity

77. _____ full ROM against resistance—normal

78. _____ full ROM against moderate resistance

**Deep Tendon Reflexes:**  0+  1+  2+  3+  4+

79. _____ hyperactive with or without clonus

80. _____ diminished

81. _____ increased

82. _____ normal

83. _____ absent
Touchy Feely

Cutaneous sensations are received via sensory nerves distributed throughout the body. When sensory deficits are suspected, assessment of dermatomes demonstrates the pattern of impairment.

84. Which dermatome innervates the sacrum?

It’s Automatic (Autonomic Nervous System)

Sympathetic and parasympathetic systems counterbalance each other. Many of the medications used to manage healthcare needs of rehabilitation patients act on these systems.

Identify the following functions as:  sympathetic (S)  parasympathetic (P)

85. _____ Constriction of pupils
86. _____ Pupil dilation
87. _____ Stimulation of sweat glands
88. _____ Constriction of superficial blood vessels
89. _____ Secretion of saliva
90. _____ Slowing of heart rate
91. _____ Increased heart rate
92. _____ Relaxation of bronchial airways
93. _____ Constriction of bronchial airways
94. _____ Gastric secretion
95. _____ Emptying of the stomach
96. _____ Relaxation of rectal sphincters
97. _____ Constriction of sphincters of the gut and rectum
98. _____ Mobilization of the liver's glycogen store
99. _____ Bladder relaxation
100. _____ Bladder contraction
101. _____ Relaxation of bladder sphincter
102. _____ Constriction of bladder sphincter
103. _____ Vasodilation of the genitalia
104. _____ Vasoconstriction of the genitalia
Have a Heart

In rehab practice, it is common to see comorbidities of the cardiac and respiratory systems. Thus, a brief review is warranted. (For a more in-depth review, please refer to a physiology text).

The Heart

The heart initiates contractions through excitation at the SA (sinoatrial) node. This electronic wave travels across the atria to the AV (atrioventricular) node and then across the ventricle. Disorders of conduction are reflected in EKG patterns.

Rate and contractility of the heart are fine-tuned to meet the body's requirements. These adjustments are mediated by the autonomic nervous system’s response to sensory data, collected by regulatory centers in the brain (hypothalamus, medulla, and cortex), and by major blood vessels.

- **Parasympathetic** stimulation of the vagus nerve (CN X) decreases heart rate, force of contraction, and excitability.

- The **sympathetic** nervous system increases the rate, force, conductivity, and excitability of the heart.

The sympathetic and parasympathetic nervous systems are both in action all the time, balancing their input to meet the body's demands.

105. Name three factors affecting coronary artery performance.

The Vessels

Arteries also are under the influence of the parasympathetic and sympathetic nervous systems.

106. What are the two main factors affecting blood pressure?
Fill in the blanks to complete the following equations.

107. **Mean arterial pressure** = _____________ _____________ x **total peripheral resistance**

108. **Cardiac output** = heart rate x _____________ _____________

Inhale/Exhale

Normal respirations are automatic and involuntary, controlled by centers in the medulla and pons. Primary innervation of the diaphragm is from the C3-5 levels of the spinal cord. These nerves form the phrenic nerve. Oxygen, carbon dioxide, and hydrogen levels in the blood stimulate the respiratory centers to regulate breathing.

**Complete the following statements.**

109. A fall in CO₂ blood levels slightly depresses respiratory centers, resulting in _________ breathing.

110. An increase in CO₂ will result in an increase in H⁺ in the cerebral spinal fluid, stimulating respiratory centers and _____________ rate and depth of breathing.

111. Arterial PaO₂ has to fall below _______ mmHg in order to get a response from respiratory chemoreceptors.

112. A severe lack of oxygen _________ the respiratory centers.

Swallow It!

There are three phases to a normal swallow.

- Oral phase
- Pharyngeal phase
- Esophageal phase
Unscramble the letters to fill in the blanks.

113. Oral phase activities include lip _________(lurscoe), to keep food in the mouth, and forming food into a _________ (Isuob).

114. During the oral phase, the _________ (uegnto) elevates and sends the bolus to the ________ (pxynhar).

115. The most important activity in the pharyngeal phase is protection of the________________ (waariy).

Code Brown (Your Bowel)

Neurological control of bowel elimination is a coordinated effort between the brain and the reflexes at the sacral level of the spinal cord.

Describe the following reflexes.

116. Gastrocolic reflex:

117. Defecation reflex:

118. Identify at least five factors influencing bowel elimination.

Indicate contraction or relaxation to complete the following statements.

119. Sympathetic stimulation of the colon will cause ________________ of the walls of the colon.

120. Sympathetic stimulation of the internal and external sphincter in the anal canal will cause ________________ of the sphincter.

121. Parasympathetic stimulation of the internal sphincter in the anal canal will result in ________________ of the sphincter.
Wee Willie Winkle (Your Bladder)

Kidney function is critical to fluid and electrolyte balance. Bladder function determines continence.

Balancing Fluids

Body fluids are either intracellular (ICF) or extracellular (ECF). Sodium is the primary solute in extracellular fluids. It reflects the osmolality of the blood. Osmolality drives fluid shifts between intracellular and extracellular fluids. To maintain homeostasis, fluid volumes are regulated by the antidiuretic hormone, aldosterone, and other hormones. Variance in hormone secretion is driven by osmolality and influenced by many factors.

Indicate increase(s) or decrease(s) to complete each statement below.

122. If serum sodium decreases, osmolality _____________________.

123. If blood osmolality is concentrated, ADH secretion _______________ to raise the body’s fluid level.

124. If blood osmolality is dilute, ADH secretion _______________ to lower the body’s fluid level.

125. Hypotension causes a(n) ________________ in ADH secretion.

126. Alcohol causes a(n) ________________ in ADH secretion.

127. Hypoglycemia causes a(n) _______________ in ADH secretion.

128. Aldosterone promotes reabsorption of sodium that will ________________ fluid volumes.

Dehydration is a common problem for patients in rehab settings.

129. List at least three causes of fluid volume deficits.

130. List the symptoms of fluid volume deficits.
Comorbidities and the effects of medications may result in fluid volume excesses.

131. Identify at least three causes of fluid volume excess. Indicate whether your selections are localized or systemic problems.

132. Identify interventions for fluid volume excess resulting in edema.

Bladder Function

Neurological control of bladder elimination also is a coordinated effort between the brain and the reflexes at the sacral level of the spinal cord.

In normal voiding, increased muscle tone in the urethral sphincters and the pelvic floor muscles maintain continence, while intravesical pressures slowly rise. When bladder volumes are large enough to stimulate the stretch receptors of the bladder (detrusor) wall, the micturition threshold is breached, pressure increases, and the urge to void is felt.

Sympathetic stimulation increases urethral sphincter tone and inhibits bladder contraction. The cortex controls contractions of the external sphincter via the pudendal nerve (known as the guarding reflex). The reflex arc is actively inhibited in this manner, and continence is maintained.

When the decision to void is made, the brain (coordinated by the cortex, pons, and midbrain) allows the external sphincter to relax, and sympathetic stimulation decreases. This allows for increased parasympathetic action, resulting in relaxation of the bladder wall.

133. What complication can occur if there is poor coordination of bladder wall contractions and sphincter relaxation?
All-Over Protection (Skin)

The skin primarily functions as a protective barrier for our bodies. It is moisture-proof and protects against dehydration and the invasion of harmful substances such as bacteria, viruses, and some chemicals.

- It contains a layer of subcutaneous tissue that functions as a shock absorber and insulator.
- It contains sweat glands to assist in temperature regulation and the excretion of water, electrolytes, and waste.

Identify which layer of skin has the following functions. Your choices are:

<table>
<thead>
<tr>
<th>epidermis</th>
<th>dermis</th>
<th>subcutaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>134.</td>
<td></td>
<td>Contains no blood vessels; melanosomes, which determine skin color, are located here</td>
</tr>
<tr>
<td>135.</td>
<td></td>
<td>A very elastic layer that contains large amounts of collagen proteins and elastin</td>
</tr>
<tr>
<td>136.</td>
<td></td>
<td>Varies in depth; contains connective tissue, blood, lymph vessels, and nerve endings</td>
</tr>
</tbody>
</table>

Nighty-Night

Adequate sleep is essential for normal body functioning. It impacts all systems, including hormonal regulation, ability to lay down new memories, cognitive processes, energy levels, and more. Depression, decreased immune response, and increased pain are associated with poor-quality sleep.
Use the following hints to track the sleep stages in the diagram below.

- A person moves through sleep stages repeatedly during a sleep session, advancing through non-REM Stages 1-4 in less than an hour, then reversing back through Stages 3 and 2 to an REM stage.
- Non-REM and REM sleep alternates throughout the sleep session, with REM cycles occurring approximately every 90 minutes.

REM and deep sleep cycles have been correlated with laying down new memories and cognitive functioning.

- The first REM cycle occurs about 90 minutes after falling asleep and lasts about 10 minutes.
- Each recurring REM cycle lasts a bit longer, and the last one may last as long as an hour.
- Brainwave patterns during REM sleep are similar to those recorded when awake.
- Pulse and respiration can speed up and become erratic during REM sleep.

McPherson, 2012; Tortora & Derrickson, 2012
What do you think? What is the impact of sleep on general health?

*Indicate whether the following statements are True or False.*

137. _____ Sleep deprivation is cumulative in its impact on the body and cognitive functioning.

138. _____ Chronic sleep deprivation is associated with weight gain.

139. _____ Chronic sleep deprivation is associated with stroke, hypertension, diabetes, and depression.

Centers for Disease Control and Prevention (CDC), 2015

There are many environmental reasons for poor quality sleep. These include noisy environments, too much light, and uncomfortable sleep surfaces.

140. Can you think of at least 5 health-related issues that are likely to disrupt sleep?

*On the computer: Complete pages 27-28.*
*Use the All Systems Go! exercise and the Anatomy & Physiology quiz to review material.*

*On completion of the quiz, go to the next page in this workbook to start the next unit, Care of Patients: CVA, TBI, SCI.*
CARE OF PATIENTS: STROKE, TRAUMATIC BRAIN INJURY, & SPINAL CORD INJURY

This unit of the workbook addresses Domain II (Functional Health Patterns: theories, physiology, assessment, standards of care, and interventions in individuals with injury, chronic illness, and disability across the lifespan).

It contains three chapters.

- Care of Patients: Stroke (CVA)
- Care of Patients: Traumatic Brain Injury (TBI)
- Care of Patients: Spinal Cord Injury (SCI)

You may proceed in this order or select the chapter you prefer to study. There are matching chapters in the computer course for each of the workbook chapter titles above. Simply go to the correct page in each to pursue your selection.

On the computer: Return to the Main Menu to start this unit, Care of Patients: CVA, TBI, & SCI, pages 1-2.
Chapter 14

Care of Patients: Stroke (CVA)

The severity of the stroke, area of the brain affected, residual deficits, and comorbidities are taken into consideration when developing a rehabilitation plan for a patient who has suffered a stroke.

What Is Your Job in This Chapter?

In this chapter, your job is to describe the cause-and-effect of stroke and to review key care strategies for patients with stroke.

Chapter Highlights

- Evidence-based care for acute stroke emphasizes quick response and prevention of secondary complications.
- There are obvious patterns of deficit for right, left, or cerebellar strokes. Rehabilitation nurses recognize these patterns and anticipate patient needs.
- A comprehensive approach to dysphagia management reduces risk, maintains nutrition and hydration, and provides appropriate stimulation for improvement in swallowing function.
- Community reentry strategies require care of the caregiver as well as a thorough assessment of patient safety issues.
There are millions of stroke survivors in our communities, and there are many who have died from stroke. Stroke frequency is declining. It now ranks as the fifth most common cause of death in the United States.

CDC, 2016_February

On the computer: Care of Patients: CVA, TBI, & SCI, pages 3-39

Types of Stroke
There are two types of strokes: ischemic and hemorrhagic.

1. Which type is most common?

Risk Factors
Public education efforts encourage early recognition of stroke symptoms and management of modifiable risk factors for stroke. One of the primary concerns in the prevention of stroke is compliance to antihypertensive medication regimens.

2. List at least 5 modifiable risk factors for stroke.

Second Stroke Facts
- Approximately 795,000 Americans experience a stroke each year—about 185,000 of those strokes are recurrent strokes.
- At least 1 in 4 (25%-35%) of the 795,000 Americans who have a stroke each year will have another stroke within their lifetime.
- Within 5 years of a first stroke, the risk for another stroke can increase more than 40%.
- Recurrent strokes often have a higher rate of death and disability because parts of the brain already injured by the original stroke may not be as resilient.
- Within 5 years of a stroke, 24% of women and 42% of men will experience a recurrent stroke.

National Stroke Association, (n.d.)b
3. List five symptoms or warning signs of stroke.

4. What is the most common vessel involved in strokes?

Using your knowledge of stroke syndromes and the information you reviewed in the *Anatomy & Physiology* chapter, indicate whether the following deficits are more typical of right (R) or left (L) hemisphere strokes.

5. _____ Right-sided paralysis
6. _____ Difficulty with depth perception and directional concepts
7. _____ Difficulty with math problems
8. _____ Denial of deficits and lack of insight
9. _____ Impulsivity
10. _____ Difficulty with symbolic interpretation
11. _____ Difficulty with geographic memory
12. _____ Speech and language deficits
13. _____ Left-sided paralysis
14. _____ Difficulty with analytical thinking
15. _____ Impaired balance

**Primary Stroke Prevention**

90% of all strokes are preventable!

- No smoking.
- Lower your blood pressure.
- **Exercise** in a manner that gets your heart pumping for an hour 5 times per week.
- No more than one glass of wine or alcohol per day.
- Eat a healthy diet.
- Maintain good oral health.

Redford, 2016
16. _____ Unilateral neglect
17. _____ Somatognosia
18. _____ Cautious, hesitant behavior
19. _____ Socially-inappropriate behavior
20. _____ Figure-ground deficit
21. _____ Constructional and dressing problems
22. _____ Egocentricity
23. _____ Right/left discrimination problems

**Emergent Care**

Acute management of a cerebral vascular accident (CVA) includes identifying whether it is a hemorrhagic or ischemic problem. Research has produced standardized protocols and guidelines for emergent care of patients with stroke. Research continues to identify alternative strategies for healing with stem cell therapy on the horizon.

The type of stroke directs interventions. The goal of management in a hemorrhagic stroke is to control the bleeding and, if possible, to limit its damage. Interventions for ischemic strokes strive to destroy the clot and re-perfuse the area. Other interventions may be used to lower blood pressure and prevent cerebral vasospasm. Education and healthcare to prevent recurrent strokes starts here and continues throughout the rest of the patient’s life.

24. Why is it so important to *Act F.A.S.T.* when a stroke occurs?

25. Identify three complications common to stroke patients during early acute care.
Alterations in Mobility

Handle With Care

The ability to move and tolerance to exercise are basic to self-care and functional mobility. Impairment in mobility is one of the most common reasons for admission to rehab services. Rehab nurses are expected to work consistently with the rest of the team to address these problems.

Indicate whether the following statements are True or False.

26. _____ Movement problems from stroke are related to UMN damage.

27. _____ Spasticity in affected limbs is the brain’s initial response to the trauma of stroke.

28. _____ Flaccid extremities should be handled with care to prevent joint, muscle, and nerve damage.

(The Rehab Nursing Series™ provides additional training on care of patients with mobility limitations in the course Get Going! Mobilize Your Patients!. You can find information at http://www.rehabclassworks.com/mobility.htm.)

Principles of Mobilization

The basic premise of mobilization is that foundation skills must be developed before more advanced skills will be mastered. This provides a sound guideline for prioritizing care for your patients. Address your patients’ needs in a hierarchical system: 1) positioning, 2) transitional activities, 3) functional activities, and 4) functional mobility.

29. According to the principles of mobilization, what are the three reasons for appropriate positioning of flaccid or weak extremities?

30. What do you anticipate to potentially be a long-term consequence for failing to protect and to carefully handle flaccid extremities?
31. What must you remember when doing ROM for a patient with spasticity?

**Transitional Activities**

Transitional activities provide the foundation for future movement activities. They focus on increasing strength, developing head and trunk control, and increasing awareness of the body in space. Failure to adequately develop head and trunk control has a significant impact on other activities such as sitting, transfers, and ambulation.

32. Identify three things you can incorporate into your daily care to facilitate the development of head and trunk control.

**Functional Activities**

As the patient develops enough strength and control, he can begin to increase participation in functional activities. Note the following general principles.

- Assist only as much as necessary.
- Allow the patient adequate time to participate.
- Use assistive devices appropriately.
- Use a consistent technique.
- Always maintain the safety of all involved.
- Always follow ordered precautions or limitations.

33. Many patients with hemiplegia use an AFO (ankle-foot orthosis) during ambulation. What is its purpose?
Functional Mobility

Functional mobility for many of our patients is dependent on selecting appropriate equipment to meet the environmental and functional limitations of the patient.

34. List the aspects of a wheelchair that should be fitted to the patient.

35. Identify at least three hazards that patients using wheelchairs should be taught to negotiate in the community.

(\textit{The Rehab Nursing Series}™ provides additional training on moving and handling patients in the course \textit{Take Care! Safe Patient Handling Works!} You can find information at \url{www.rehabclassworks.com/sph.htm}.)

ADLs & Transitions Home

In order to assist your patient to be as independent as possible, there must be:

- A safe environment
- Access to appropriate equipment
- Opportunity to practice skill development in an organized and consistent manner

Some strategies that help to compensate for perceptual deficits include organizing the environment to address specific deficits. This can be done by highlighting important items with bright colors, using partitions and dividers in drawers and closets to organize materials, keeping the environment well lit, etc.
Apraxias are best managed with a consistent approach in training, which will allow the patient to lay down new patterns of behavior. **Practice is critical** to success. Some patients will require the development of a cuing system to assist in the initiation of an activity.

Patients with homonymous hemianopsia should be taught to scan the environment. Unilateral neglect is difficult to remedy, requiring much more effort than simply teaching the patient to scan to that side. The patient needs to handle the affected side as much as possible to reintegrate it into his perception of self.

36. Describe key concepts you will use to assist a hemiplegic patient with self-care.

**Perceptual Deficits**

Perceptual deficits are common, especially in persons with right brain stroke. If you think about the areas of the brain damaged with a right middle cerebral artery stroke, these deficits are not surprising.

*Define the following terms. Use the Reference link in the computer course for assistance, if needed.*

37. Agnosia:

38. Somatognosia:

39. Anosognosia:
40. Homonymous hemianopsia:

41. Figure-ground deficit:

42. Form-constancy deficit:

43. Unilateral neglect:

44. Geographic/topographic memory deficit:

45. Apraxia:

46. Ideational apraxia:

47. Ideomotor or motor apraxia:

Schematic representations of how a visual scene might appear to people with left homonymous hemianopsia (middle panel) and left neglect (bottom panel). Whereas hemianopsia obeys the midline and affects only the contralateral visual field, neglect affects parts of the ipsilateral field in addition to the contralateral field, focusing attention toward the side of the lesion.

From Li & Malhotra, 2015
Impaired Swallowing

Dysphagia is a common problem for patients following stroke. Because the most common cause of aspiration pneumonia is dependence for feeding, those assisting patients to eat should control of the environment, food consistency, feeding rate, and position while eating to promote safe self-feeding and further reduce the risk for aspiration and the development of pneumonia. Dysphagia resolves for most patients during the first several weeks of recovery.

Carlaw et al, 2011; Mosheim, 2006

48. Identify at least three signs/symptoms of problems during the pharyngeal phase of swallowing.

49. Identify at least two signs/symptoms of problems during the esophageal phase of swallowing.

50. What should you incorporate into your plan of care as a preventive measure if your patient is at high risk for aspirating?

A consistent approach demonstrates management strategies for family caregivers and facilitates successful training of the patient.

Identify appropriate interventions for each of the following categories of care employed in the management of dysphagia.

51. Positioning:
Alterations in Nutrition

Elderly patients have an increased risk for alterations in nutrition. Premorbid problems may include protein, hydration, and vitamin deficiencies. This is further compounded with stroke or dysphagia. If the patient is 20% or more below ideal body weight, nutritional intake is considered to be poor.

57. What lab values should you monitor to evaluate your patient’s nutritional status?
Other issues, such as side effects of medications, paralysis, ill-fitting dentures, or lack of appropriate equipment or resources, can contribute to malnutrition.

58. Identify at least three interventions you would use to assist an elderly patient, who is post stroke, with a poor nutritional intake.

Fluid Balance Deficit

Dehydration is common in the elderly and is compounded significantly by dysphagia and changes in environment and routine. This is one of the most common problems our patients face.

59. How will you help a patient with dysphagia maintain an adequate fluid intake?

Bowel Elimination

Constipation is a common bowel problem faced by the elderly. Stroke may bring its own problems with the development of an uninhibited neurogenic bowel.

60. What signs/symptoms will you see to indicate an uninhibited neurogenic bowel problem?
It is necessary to assess your patient carefully to determine whether the problem is primarily constipation or neurogenic, or a combination of both. Premorbid histories can be helpful in making this determination and in implementing a plan of care. Prior to starting any bowel program, you should make sure the bowel is free of impaction.

61. Describe the interventions you would use if the problem were primarily a constipation problem.

62. What interventions would be most valuable if the patient was primarily dealing with an uninhibited neurogenic bowel?

**Urinary Elimination**

An assessment of premorbid voiding patterns and problems will help identify the type of bladder problem your patient is facing following a stroke. The most common bladder problem related to stroke is uninhibited neurogenic bladder resulting in urge incontinence.

63. Can you think of at least five premorbid conditions that may contribute to bladder incontinence that you should look for when assessing a patient with stroke?
64. What signs/symptoms will you see to indicate an uninhibited neurogenic bladder problem?

65. List at least three routine interventions you will use with a patient with uninhibited neurogenic bladder problems.

It is suggested that you begin with timed voiding or habit training and advance to prompted voiding as the patient’s cognitive status, strength, and mobility improve.

*Define the following bladder programs.*

66. Timed voiding:

67. Habit training:

68. Prompted voiding:

69. Bladder retraining:
If these techniques are unsuccessful, the team may consider the use of medications such as propantheline, (Pro-Banthine), imiprimine (Tofranil), oxybutynin (Ditropan), flavoxate (Urispas), dicyclomine (Bentyl), terbutaline.

**Impaired Communication**

Communication problems following stroke affect receptive and/or expressive communication, including the ability to read, write, or recognize symbols. The patient should be evaluated carefully for safety risks related to impaired communication, and steps should be taken to prevent problems or injury. Recognize that these patients likely will be unable to communicate needs, heed signage, use call lights, etc.

*Identify the communication strategies you will use for patients who demonstrate the following language impairments.*

70. Expressive aphasia:

71. Receptive aphasia:

**Risk of Injury**

Sensory-perceptual deficits and impairments in judgment make patients who have suffered stroke at particular risk for injury.

72. Can you identify at least three risks that family caregivers should address if the patient is returning home following a stroke?
Sweetheart!

We are all sexual beings; age and disability do not negate that. Sexuality is expressed through:

- Communication patterns
- Body image and presentation
- Roles
- Physical contact

Early discussion about sexuality is important for the patient and the partner to encourage open communication and address misinformation. The nurse can use the PLISSIT model to address this issue.

- **Permission**
- **Limited Information**
- **Specific Suggestion**
- **Intensive Therapy**

By granting permission, you encourage the patient and partner to ask questions and express concerns. Of course, if they are not interested, you should not force the issue on them.

**Limited information** is used to answer questions with relevant information, using responses as a guide to determine how much information and detail the patient or partner is interested in.

**Specific suggestions** are used to provide direction to the patient and partner as they explore the changes in their relationship. Some specific suggestions for stroke patients may include:

- Allowing the non-disabled partner to take a more active role
- Using positions that do not require support from weakened muscles
- Having the non-disabled partner guide or cue the patient with verbal, gestural, or hand-over-hand actions
• Presenting stimuli on the unaffected side
• Allowing enough light for visualization
• Taking care of bowel and bladder needs prior to sexual activity

Sexual activity patterns prior to the stroke often are indicative of potentials after the stroke. Be alert to complications from medications and chronic diseases; provide education and alternatives accordingly.

**Feeling Blue?**

Psychosocial issues common to the stroke population include:

• Self-concept disturbance
• Altered role performance
• Spiritual distress
• Impaired social interaction
• Diversional activity deficit

It is important to build rapport and establish a trusting relationship with the patient and family to understand these issues and to assist them as they cope with the changes in their family. Depression is a particular problem following stroke. It may be situational or may be a physiological effect of the stroke.

73. What intervention prevents and treats depression following stroke?

**Risk of Caregiver Role Strain**

Community caregivers of the patient with a stroke are often elderly spouses or children with active families of their own. This presents an additional risk for burnout.
Community Living

Resources, support, and creativity are important to successful community living. Many stroke patients have one or more comorbidities requiring follow-up and medical care.

74. Can you identify at least three types of medication frequently-prescribed for patients with stroke that require monitoring?

(The Rehab Nursing Series™ provides additional training on this population in the course Rehabilitation of Stroke. You can find information at www.rehabclassworks.com/stroke.htm.)

Read the next pages in this workbook to start the next section.

Brain injury is not always accidental. It is often the result of high-risk behavior and choices. It is astounding to realize the number of healthcare workers who care for these patients and still do not wear helmets, use safety equipment, or even consistently keep their children in the back seat and in safety seats/belts. We should be role models and educators of preventing injury!

Chapter Highlights

- Diffuse brain injury is associated with acceleration/deceleration injuries and leads to a wide variety of deficits.
- Patients who have sustained brain injury face all the problems commonly found in stroke. These problems range from mild to severe.
- The Rancho Los Amigos Scale of Cognitive Functioning is used to evaluate cognitive function and recovery. There are guidelines for interventions for cognitive improvement at each level of function.
- Memory impairment and poor judgement are the most serious problems following brain injury. It creates a tremendous caregiver burden.
What Is Your Job in This Chapter?

Your job in this chapter is to describe the cause-and-effect of brain injury and to review key care strategies for patients with brain injury. Remember that persons with brain injury will face many of the same issues addressed in the previous chapter related to stroke.

On the computer: Care of Patients: CVA, TBI, & SCI, pages 40-70

The majority of persons sustaining brain injuries are not admitted to rehabilitation centers. These injuries are considered minor and incidents of post-concussive syndrome. Many of these patients describe changes in memory, fatigue, irritability, and chronic headache as sequela to minor injuries. Others have moderate to severe brain injuries and may require months or years of rehabilitation to regain function. Most with severe injuries do not fully recover.

Wagner, Arenth, Kwasnica, & McCullough, 2016

Define the following terms.

1. Closed brain injury:

2. Open brain injury:

3. Diffuse brain damage:

Brain injury results from primary and secondary insults to the brain. **Primary** damage occurs from the actual impact or trauma of the injury and includes:

- **Acceleration/deceleration forces**, which bounce the brain off of the inside of the skull, resulting in coup/contracoup injuries; frontal and temporal lobes are most susceptible to damage from these forces.
• **Rotational forces**, which shear white matter axons, causing diffuse axonal injuries (an injury not requiring loss of consciousness)

• **Extracranial damage to the scalp, skull, or dura mater**, such as penetration injuries from bullets, which can cause damage at the entrance and exit sites, as well as from concussive waves as the bullet passes through brain tissue

• **Intracranial damage**, which may be focal or diffuse

**Secondary** insults result from the brain's response to the initial trauma. These include:

- Systemic responses

- Swelling and edema, which can lead to brain distortion, shifting, and herniation

- Hypoxia and ischemia of brain cells secondary to pressure and swelling

- A cascade of biochemical events that interfere with metabolites and electrolytes of the brain, causing further damage

Unchecked secondary insults can cause more damage than the original brain injury!

LeCroy & McMahon, 2015; Wagner et al, 2016

**Severity of Injury**

Acute management of a brain injury focuses on controlling the cascading secondary insults, which can create more damage than the original injury. Once this process is stabilized, the team must concentrate on avoiding complications of hypoxia, immobility, and posturing in order to preserve function for future recovery.

*Define the following terms.*

4. Coma:
5. Vegetative state:

6. Minimally-conscious state:

7. When is a patient considered to have progressed past a minimally-conscious state?

Initial Glasgow Coma Scale (GCS) scores, the length of time a patient remains in a coma, and the length of time in posttraumatic amnesia (PTA) are used to determine the severity of injury.

8. Define posttraumatic amnesia:

9. Complete this grid with the criteria for each indicator.

<table>
<thead>
<tr>
<th></th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
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<tbody>
<tr>
<td>Glasgow Coma Scale</td>
<td></td>
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<tr>
<td>Loss of Consciousness (time)</td>
<td></td>
<td>30 min – 24 hours</td>
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<tr>
<td>Length of PTA</td>
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</table>

The mechanisms of recovery from traumatic brain injury are still somewhat unclear. We do know that recovery generally is incomplete, even for those with mild TBI, who often are left with residual problems primarily affecting memory.
and attention span. Key variables associated with recovery seem to be related to the following.

- Resolution of physiological factors that impair optimal health and function, such as edema, infections, or cardiopulmonary disorders
- Recovery of brain function through the development of new synapses, generation of new nerve fibers, or finding another part of the brain to do the job
- Adaptation and learning of alternative methods of action to achieve the same outcome

**Early Complications**

The patient’s progress may be hindered by other complications that occur during recovery from brain injury.

10. Identify three complications common to brain injury patients.

11. Why should you monitor lab values and intake/output during early recovery periods following TBI?

12. Complete this grid with the criteria for each indicator.

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<th></th>
<th>DI</th>
<th>SIADH</th>
<th>CSW</th>
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<tbody>
<tr>
<td>Urine output</td>
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<tr>
<td>Serum Na</td>
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<td>Low</td>
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<tr>
<td>Urine Na</td>
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<tr>
<td>Serum Osmolality</td>
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<td>Low or normal</td>
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<tr>
<td>Urine Osmolality</td>
<td></td>
<td>Low or normal</td>
<td></td>
</tr>
<tr>
<td>Central Venous Pressure</td>
<td>Normal or low</td>
<td>High</td>
<td>Low</td>
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</table>
Cognitive Processes

The Rancho Los Amigos Levels of Cognitive Functioning Scale often is used to evaluate the patient's cognitive and behavioral functioning following brain injury.

*Match the correct level to each description.*

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<td>VII</td>
<td>VIII-IX-X</td>
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<td>13.</td>
<td>_____</td>
<td>Localized response: blinks to strong light, turns toward and away from sounds, responds to physical discomfort; inconsistent response to commands</td>
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<td>_____</td>
<td>Confused-appropriate: inconsistent orientation; recent memory impaired, but beginning to recall the past; consistently follows simple directions; maintains goal-directed behaviors with assistance</td>
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<tr>
<td>15.</td>
<td>_____</td>
<td>Purposeful-appropriate: consistent in exhibiting purposeful behavior appropriate to situation</td>
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<tr>
<td>16.</td>
<td>_____</td>
<td>Generalized response: reflexive responses to stimulation or pain</td>
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<tr>
<td>17.</td>
<td>_____</td>
<td>No response: no responses to pain, touch, sound, or sight</td>
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<tr>
<td>18.</td>
<td>_____</td>
<td>Confused-agitated: alert, active, potentially aggressive; may exhibit bizarre behavior that is non-purposeful; extremely short attention span</td>
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<tr>
<td>19.</td>
<td>_____</td>
<td>Automatic-appropriate: able to perform daily activities in a familiar environment in an automatic manner; noticeably deteriorates in unfamiliar surroundings or changes in routine; unable to realistically plan the future</td>
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<td>20.</td>
<td>_____</td>
<td>Confused-nonagitated: able to grossly attend to the environment but is highly distractible, requiring constant redirection; has difficulty with new tasks; becomes agitated when stimulation is too intense for him to handle</td>
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<tr>
<td>21.</td>
<td>What is the main objective of treatment during Rancho Levels I-III?</td>
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</tbody>
</table>
22. What is the main objective of treatment during Rancho Level IV?

23. What is the main objective of treatment during Rancho Levels V-VI?

24. What is the main objective of treatment during Rancho Levels VII-VIII?

Pay Attention!

Cognitive deficits are some of the hardest problems to address following TBI. Cognitive processing is complex and is dependent on multiple structures. The lowest functional cognitive process is \textbf{arousal}. The RAS system has to be functioning well enough for the person to be awake enough to recognize that a stimulus has occurred.

25. Name the other three components of cognitive processing.

26. What is the most common reason for attention deficits following TBI?

1:1 With Brad

Safety is a primary concern as patients move through Rancho IV agitation and the resolution of PTA.

\textit{Complete the following statements.}

27. There is \underline{___________} agitation noted in patients once PTA has resolved.

28. The recommended tool used to track agitated behavior is the Agitated \underline{_______________} Scale.
Memory Impairment

Failure to lay down new memories is as detrimental as failure to retrieve them. Teaching skills to a person following TBI can be next to impossible with the failure of memory.

29. *What do you think?* Will memory aids be more effective before or after PTA is resolved?

Select the word that best completes the sentence.

30. Following TBI, a person is more likely to learn with (procedural/verbal) instruction.

31. Following TBI, a person is (likely/unlikely) to be a good self-reporter of ability to learn.

32. Following TBI, a person may learn new tasks best with (errorless/trial-and-error) learning.

33. Following TBI, a person can (usually/sometimes) compensate well with memory aids.

34. What is the key to effective use of memory aids?

Executive Function

Structured environments make it difficult to evaluate the full extent of executive dysfunction, which tends to be most apparent when new and novel situations are presented. Impulsivity, poor judgment, distractibility, and lack of insight are just a few of the problems that result from impaired executive functioning.

35. Identify key components of executive functioning.
36. List three categories of intervention for executive dysfunction.

(The Rehab Nursing Series™ provides additional training on care of patients with cognitive dysfunction in the course Wandering, Confused, & Agitated? Cognition & Behavior Management. You can find information at www.rehabclassworks.com/Cog.htm.)

Mobility

Impairment in mobility following TBI can be extremely variable, ranging from a mild limp to spastic quadriparesis and locked-in syndrome. It is important that spasticity be managed in order to prevent the development of contractures and to decrease pain.

37. True or False? Most patients with brain injury present with hemiparesis.

Altered Nutrition

There are three main causes of nutrition problems following TBI. They include the development of a protein/energy malnutrition during the early post-acute recovery phase, intolerance to tube feedings, and either excessive eating or inattentiveness to eating due to damage to the satiety center and frontal lobes. In addition, there may be significant dysphagia problems. (See the section on dysphagia in the Stroke chapter.)

38. What safety risks should you be aware of in persons with brain injury who has damage to the satiety center?
Altered Elimination

Bowel and bladder problems following TBI generally are related to cognitive deficits, though other problems such as side effects of medications, immobility, and nutritional or hydration problems also may be factors. Those issues are best managed by directly addressing them.

39. Describe your intervention strategies for a patient at Rancho Level IV who tends to void wherever he is when he feels the urge.

Risk for Injury

Risk of injury to the patient or others is significant in patients who are marginally mobile and operating with impaired memory and judgment, such as found in Rancho Levels IV-V. It takes creativity and perseverance to prevent injuries from happening. Guidelines are readily available in most organizations regarding the use of restraints and other aids to prevent falls and elopement. In addition, there are multiple commercial products on the market. One of the key issues in preventing falls and elopement is the appropriate management of the environment.

40. Identify at least two interventions you would use to prevent falls in a marginally-ambulatory patient.

Altered Sexuality Patterns

Sexuality problems following TBI range from no problem at all to hyposexuality, sexual immaturity, and sexual inappropriateness. Hyposexuality may be related to hormonal problems or impairments in initiation and motivation secondary to frontal lobe injury. Hormonal issues need to be addressed medically. Having the partner initiate and guide sexual activity may help initiation problems.
More often sexuality problems are related to a loss of self-esteem, depression, and isolation resulting from difficulty sustaining relationships. These issues may arise from egocentric behaviors that are combined with failure to appropriately read social cues from the partner.

41. Identify suggestions you would make to a mother who indicates that her 20-year-old son (Rancho VI-VII) is embarrassing her when she is out in public by being sexually explicit.

Risk of Caregiver Role Strain

Caregiver role strain is as serious an issue following TBI as it is for any other disability. Entire family systems are interrupted following TBI and social isolation, depression, and dissolution of relationships are common.

Marriage survival rates following TBI are poor, with the spouse mourning the loss of a lover, friend, and partner. Family systems that survive seem to need a year or so to find a way to adapt to the structure and lack of flexibility they now may face. Families feel a strong need for support on returning to the community and often are at a loss of what to do once they are out of the system. For some, community programs offer great assistance; for others those programs are out of reach or too short-termed to make a significant impact. Support groups can be lifesavers if they are available.


42. What suggestions will you give the young wife of a 25-year-old who is being discharged from services, functioning at a Rancho Level VI, and who will not be returning to work?
Community Living

Community living often brings with it a desire to return to work or school. Vocational rehabilitation services and school programs can facilitate this return in actual or modified manners. Many laws have been enacted over the years to discourage the impression that those with a disability should sit quietly at home.

The laws impacting children have been especially helpful in establishing education as a right of all individuals and in providing services within the school system for those with congenital disabilities.

(The Rehab Nursing Series™ provides additional training on this population in the course Rehabilitation of Brain Injury. You can find information at www.rehabclassworks.com/Brain Injury.htm.)

Read the next page in this workbook to start the next section.
Chapter 16

Care of Patients: Spinal Cord Injury (SCI)

Research continues to try to find a way to cure spinal cord injury. Great advances in understanding the injury process already have changed the way we treat patients. It is hoped that we will see a cure for spinal cord injury in our lifetime.

What Is Your Job in This Chapter?

Your job in this chapter is to describe the cause-and-effect of spinal cord injury and to review key care strategies for patients with spinal cord injury.

Chapter Highlights

- Function following spinal cord injury is dependent on the level of injury, complications, and the completeness of injury.
- Level of injury determines the significance of the impact on physiological functions of the body. Those with higher level injuries have more problems.
- Prevention of health complications (particularly respiratory, skin, bowel, and bladder) are key components of lifestyle following spinal cord injury and must be managed each and every day.
Care of the Patient: Spinal Cord Injury

Spinal cord injury presents complex challenges to the rehab team. While research continues to pursue options for improving outcomes and function, and more injuries than ever are incomplete because of improvements in emergent and acute care, many spinal cord injuries are preventable. Prevention is important to reducing the frequency of this injury.

1. What is the most common cause of cervical injury in older adults?

Severity of Spinal Cord Injury

Spinal cord damage may be complete or incomplete and may occur at any point along the spinal cord. It may be caused by trauma, tumor, infarct, or infectious disease. Non-traumatic cord damage occurs secondary to pressure, disease processes, and anoxia. Cord damage in a trauma is caused by traumatic hemorrhagic necrosis.

Actual impingement of the cord during trauma may be from:

- Flexion or flexion-rotation
- Compression
- Hyperextension
- Penetration

The neurological level of injury (NLI) is defined as the lowest segment of the cord that tests as normal for sensation and antigravity motor function on each side of the body. Myotome level and dermatome level are assessed individually.

2. Define the zone of partial preservation.
3. Complete this statement. The patient is considered to have paraplegia when spinal cord injury is at or below the ________ level of the cord.

4. Which of the following is an incomplete lesion?
   a. Motor and sensory function intact at C7
   b. Motor function intact at C7 with sensory function intact at C7 and recognition of light touch in the perineum
   c. Motor function intact at C7 and sensory function intact at T2 on right and left

5. If there is a vertebral injury at L4-5 due to a fall on the buttocks, is the resulting cord injury an upper or lower motor neuron injury?

Types of Spinal Fracture

There is not necessarily a direct relationship between the type of spinal column fracture and neurological deficits. In fact, there may be bony injury without neurological deficit.

- Simple fractures of the spinous or transverse processes often leave no neurological damage.
- Neurological damage is likely with a compression fracture (wedge), comminuted fracture (burst), teardrop fracture, and dislocation or subluxation of the vertebrae.

6. What is a common cause of a hyperextension fracture?

Spinal Cord Injury Syndromes

Areas to specific parts of the spinal cord and their tracts cause specific patterns of deficit. For example, injury to the conus medullaris or cauda equina damages the LMN sacral nerve roots causing flaccid paralysis of the bowel, bladder, and lower limbs. It will also impair sexual function.
7. Sacral sparing occurs with central cord lesions. What deficits would you expect to see?

8. What deficits do you expect to see if the patient is diagnosed with Brown-Séquard syndrome?

Primary & Secondary Insults

The primary objective at the time of trauma is to reduce the risk of further damage. Immediately following spinal cord injury there is a period of spinal shock.

9. Define spinal shock:

10. How long does spinal shock last?

11. How do you know it is resolved?

It is important to recognize the impact of spinal shock in patients with UMN lesions. As spinal shock resolves, flaccidity is replaced with spasticity and a completely different set of motor responses occurs below the level of the lesion. The rehab team should educate and prepare patients for this change so that care needs can be anticipated.

Acute Care

Initial acute care efforts focus on stabilization and prevention of complications. Optimum acute care also reduces the risk of complications of immobility. Early complications can be serious and result in death.
12. Identify three serious complications you should be concerned about during early acute management of spinal cord injury.

(\textit{The Rehab Nursing Series™} provides additional training on preventing complications of immobility in the course \textit{Go HOM! Preventing Complications From Immobility}. You can find information at \url{www.rehabclassworks.com/Immobility.htm}.)

\textbf{Respiratory Dysfunction}

Due to the high risk for pulmonary complications following SCI, care must be taken to manage respiratory function aggressively and effectively from the time of injury forward. SCI alters lung, chest wall, and airway mechanics through paralysis of the chest and abdominal muscles, causing \textit{restrictive} lung disease.

In spite of the fact that persons with higher levels of injury are more prone to respiratory problems, respiratory insufficiency and complications of altered respiratory function are the primary cause of death for \textit{all} persons at any level of injury. Comorbid cardiopulmonary disease increases this risk.

\textit{Branche-Spelich, Reyes, & Miller, 2012; Chin, 2016}

13. From which group of nerves does direct neurologic control of the diaphragm arise?

Patients with spinal cord injury demonstrate ventilatory dysfunction through a high arterial partial pressure of carbon dioxide (PaCO$_2$). This results from failure to effectively blow off the end products of respiration, thereby retaining carbon dioxide. Remember that a low arterial PaO$_2$ indicates alterations in gas exchange.
Describe the impact of neurological dysfunction on the respiratory system (respiratory ability, ability to cough, and impact on FVC) at each of the following levels.

14. Injury at/above C3:

15. Injury at C3-4:

16. Injury at C5-T4:

17. Injury at T5-T10:

18. What does hypercarbia indicate in a patient with tetraplegia?

19. *Circle the correct choice:* An increased respiratory rate with shallow respirations may be indicative of (respiratory insufficiency/ineffective breathing patterns).

**Diaphragm Support**

The vital capacity of persons with tetraplegia or high paraplegia is posturally dependent.

- When sitting, the diaphragm flattens and becomes less effective than when supine.
- This flattening occurs because, due to the paralysis of the abdominal muscles, the abdominal contents fall forward when sitting.
- An abdominal binder should be used when sitting to hold abdominal contents in, promoting efficient diaphragm function.

Bryce, 2016
Respiratory Care

High injuries are characterized by abdominal breathing patterns (intercostals are drawn in and abdomen pushes out with inspiration) and exaggerated use of the accessory muscles of the neck and shoulders. Monitor patients closely for respiratory muscle fatigue and teach preventive care habits.

20. Identify at least five health promotion behaviors that you should teach to patients with respiratory compromise due to spinal cord injury.

Ventilator Dependence

Volume-cycled ventilators are preferred for those who require the support of a ventilator. They can talk while on a portable ventilator system using an uncuffed tracheostomy tube (usually size 6 or smaller). Air passing around the tracheal tube during expiration permits vocalization if the patient can coordinate with the ventilator. Many other devices such as the electrolarynx and tracheostomy tube devices also are available to support communication with a tracheostomy tube.

Considerable planning is required prior to sending the patient home with a ventilator. Emergency responses must be rehearsed. Backup systems for all components of the ventilator, suctioning, and oxygen delivery systems must be readily available. Community support systems must be informed of the situation and key phone numbers should be posted visibly. A resuscitation bag should be readily available, and caregivers should be trained to use it and all other equipment.

On the Vent?

Some patients with high cervical injuries may require ventilators only part of the time.
Ineffective Breathing Pattern/Ineffective Airway Clearance

Paralysis of the intercostals and abdominals leads directly to poor movement of secretions, impaired gas exchange, and eventual collapse of the alveoli, hypoventilation, and hypoxemia.

Regular respiratory assessment should be performed until the patient has established a new baseline and has been trained to take over self-management. In addition to the routine methods of respiratory assessment, an assessment of the patient's ability to cough and the force of that cough are necessary.

Grading of coughing effectiveness:

- **Functional**, if able to clear secretions without assistance
- **Weak functional**, if able to clear airway but requires assistance to expel secretions
- **Nonfunctional**, if unable to clear secretions or expel them without major assistance

Wetzel, 2009

Care management strategies should be directed at minimizing the impact of functional impairments and preventing the development of complications.

21. What is the purpose of a bronchial hygiene program?

22. List the two most basic components of preventing pulmonary complications.

23. Relative to pulmonary function, why is it important to make sure the patient is positioned properly in bed and in the chair?
While performing bronchial hygiene, it is important to avoid overfatiguing the patient and to assist to clear secretions as they are brought up.

24. Identify three other bronchial hygiene strategies you may teach your patients to use for preventive and maintenance care.

25. What instructions will you give your patient regarding the actions that should be taken if congestion increases?

Note that you should be aware of the risk of aspiration and difficulty swallowing in patients with tracheostomies and those with halo supports, which maintain the neck in extension.

Avoid the Clot!

Venous thromboembolism (VTE) is a disease that manifests as deep vein thrombosis (DVT) and/or pulmonary embolism (PE). Symptoms are often subtle or absent and persons with sensory impairment will not feel pain.

26. When is DVT most likely to develop following SCI?

27. What is the first thing you will do if you suspect a DVT? Why would you take those actions?

28. List three symptoms of pulmonary embolism (PE).
29. What are the recommendations for medication prophylaxis for VTE prevention following SCI according to clinical practice guidelines from the Consortium for Spinal Cord Medicine?

30. What are the recommendations for use of pneumatic compression devices for VTE prevention following SCI according to clinical practice guidelines from the Consortium for Spinal Cord Medicine?

Poikilothermia

Poikilothermia refers to the body’s tendency to assume the temperature of the surrounding environment.

31. Which patients are at the highest risk of developing problems related to poikilothermia?

32. List at least three interventions you will use to help keep a patient with poikilothermia at an appropriate body temperature.

Dysreflexia Facts

Autonomic dysreflexia is a potentially life-threatening response of the autonomic nervous system to what it perceives as noxious stimuli. It develops after spinal shock is resolved.

33. List the two most common causes of autonomic dysreflexia.
34. List at least six symptoms of autonomic dysreflexia.

**Autonomic Dysreflexia**

Patients and caregivers need to recognize the onset of dysreflexia and respond appropriately. An algorithm for dysreflexia treatment instructions, based on the clinical practice guidelines from the Consortium for Spinal Cord Medicine, can be found in the **Appendix** to this chapter. Patients who are at risk should rehearse responding to this situation and should carry a dysreflexia kit, including these instructions, with them at all times.

*Use the clinical practice guidelines from the Consortium for Spinal Cord Medicine, as found in the dysreflexia algorithm in the Appendix to this chapter, to answer the questions below.*

35. What is the first intervention you should take when you suspect autonomic dysreflexia?

36. When, during the course of treating an episode of dysreflexia, should you administer antihypertensive medication?

**Orthostatic Hypotension**

Orthostatic hypotension is a common problem following a spinal cord injury. The higher the level of injury and more complete the paralysis, the greater the likelihood of developing the problem. Causative factors include vasodilation below the level of the lesion, inadequate venous return, and disruption of the sympathetic nervous system. The patient will usually accommodate to the situation over a couple of months; it usually disappears after spasticity develops.
37. List three interventions you can use to counteract the effects of orthostatic hypotension.

38. List two precautions that should be taken with a patient with SCI at risk for orthostatic hypotension.

**Maintaining Skin Integrity**

Patients with SCI are at significant risk for pressure injury as well as frostbite and sunburn.

39. Why are patients with SCI at such significant risk for pressure injury?

**An Ounce of Prevention…**

The primary defense against pressure injury development is prevention.

40. Identify at least five general pressure injury preventive care strategies.

---

**What Cost?**

Millions of dollars are spent each year to care for pressure injuries. In spite of education, technology, and medical expertise, patients continue to develop pressure injuries. This trend has led to increasing regulation and quality auditing, driving up the cost of healthcare.

Medicare no longer reimburses hospitals for the extra care and costs required to manage certain preventable hospital-acquired conditions. This list includes pressure ulcers. This is a direct statement on the expectations for the quality of care provided by nursing staff.
Patients and caregivers should be taught pressure relief techniques as soon as possible and should be encouraged to participate in and take responsibility for care. **Nurses often confuse patients by failing to follow a consistent program and presenting inconsistent information to them.**

Most patients with impaired sensation need to do pressure reliefs at least every 15-30 minutes while in a wheelchair. Determine your patient's needs by considering the type of cushion the patient is sitting on and his capillary refill. Coordinate with the therapist to identify the most effective plan, and instruct the patient, other team members, and caregivers accordingly.

Common methods of pressure relief include:

- Changing position in a tilting wheelchair
- Leaning side-to-side
- Leaning forward
- Pushing up on arms of chair to raise body
- Lying down for a period of time

**Remember that there is a direct relationship between pressure and time.** A large amount of pressure for a short period of time can be just as damaging as a lesser force for a longer period of time.

Caution should be used in placing footboards on the beds of patients with impaired lower extremity sensations because they can contribute to foot injury and make it more difficult to turn and position the patient. Use ROM and proper positioning instead.

**Compensation**

Teach those with sensory impairment to compensate for the loss by thinking and monitoring for risk. Remind them to check temperatures of surfaces and water by using an area that does have sensation (or by asking a caregiver to check). Burns and frostbite are a risk for those with impaired sensation.
Recognizing Pressure Injury

If a pressure injury occurs, there should be prompt action to determine the cause, mitigate it, and heal the wound. Correct staging of pressure injury is required for regulatory quality tracking programs.

41. Katy’s roommate Jean has a pressure injury caused by sitting on the drainage tubing of her catheter. The injury, found on the back of Jean’s thigh, is pictured above. What stage is this injury?

Wound Healing

Wound healing progresses through stages:

- **Inflammatory phase**: inflammation and digestion of wound debris
- **Fibroplastic or proliferation phase**: sprouting of new capillaries, wound contraction, and development of collagen and epithelialization
- **Maturation**: scar formation; scar tissue is easily traumatized

Healing requires attention to the wound itself and the overall health of the patient.

*Use what you know about pressure injury and wound recovery to identify specific factors impairing wound healing.*

42. Factors affecting the wound at the site:
43. Systemic factors:

Wound Care Products

Here is a summary of wound care products and their intended uses.

44. Complete this grid, matching the product with its description.

<table>
<thead>
<tr>
<th>Dressing Type</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) ____________</td>
<td><strong>Used to pack and fill wounds and absorb large amounts of drainage. Supports autolytic debridement. Requires a secondary dressing.</strong></td>
</tr>
<tr>
<td>enzymatic debrider</td>
<td><strong>Used to debride necrotic tissue. Requires a secondary dressing to maintain moist healing environment.</strong></td>
</tr>
<tr>
<td>foam</td>
<td><strong>Protects fragile areas and absorbs moderate to large amounts of drainage. Also provides fill and supports autolytic debridement. May be used as a primary or secondary dressing.</strong></td>
</tr>
<tr>
<td>b) ____________</td>
<td><strong>Protects superficial partial-thickness or shallow full-thickness wounds while absorbing small amounts of drainage and supporting autolytic debridement. May be used as a primary or secondary dressing.</strong></td>
</tr>
<tr>
<td>wound fillers (beads, pastes, powders, gel, granules, ropes, pillows)</td>
<td><strong>Used to pack wounds and absorb drainage or maintain a moist wound surface.</strong></td>
</tr>
<tr>
<td>hydrofiber</td>
<td><strong>Used to pack and fill wounds and absorb large amounts of drainage (33% more than alginates). Supports autolytic debridement. Requires a secondary dressing.</strong></td>
</tr>
<tr>
<td>d) ____________</td>
<td><strong>A gel or sheet used to donate moisture to a wound to maintain a moist healing environment. Indicated for partial and full-thickness wounds. Requires a secondary dressing.</strong></td>
</tr>
</tbody>
</table>
### Shocking News

Management of elimination needs following a spinal cord injury requires a thorough understanding of the type of injury and the status of spinal shock. Before planning care, you should:

- Identify the level and completeness of injury.
- Evaluate reflex responses of the sacral area.
- Assess previous patterns and lifestyle.
- Discuss desired outcomes and anticipated daily routines with the patient and caregiver.

### Antimicrobials

A wound dressing that delivers the effects of antimicrobial agents (antiseptics, cadexomer iodine, honey, Hydrofera Blue®, silver) to infected wounds. Used in partial or full-thickness wounds. Requires a secondary dressing.

### Charcoal

Used as a “filter” for odor control in wounds. May require a secondary dressing.

### Collagen

Gels, pads, particles, powders, sheets, or solutions used to enhance deposition of collagen fibers in a full-thickness wound. Requires a secondary dressing.

### Composite

A combination of two or more physically distinct products manufactured as a single dressing with several functions. Used for partial or full-thickness wounds without depth. May be used as a primary or secondary dressing.

### Contact Layer

Protects the wound bed from direct contact with other agents and dressings. Used for partial or full-thickness wounds with or without depth, infected wounds, donor sites, or split-thickness skin grafts.

### Other Dressings

- **E)** ________________
  Woven or non-woven pads, ribbons, strips, and rolls used to scrub, prep, wipe, absorb, or protect. Impregnated gauze can hydrate, absorb drainage, or deliver antimicrobial agents. May be used as a primary or secondary dressing.

*Haesler, 2014*

*(The Rehab Nursing Series™ provides additional training on skin and prevention of pressure injuries in the course *Go HOM! Preventing Complications From Immobility*. You can find information at [www.rehabclassworks.com/Immobility.htm](http://www.rehabclassworks.com/Immobility.htm).)*
It is very important to involve the patient and, if appropriate, the caregiver, in the planning and evaluation process in order to develop a program they can live with, thereby increasing the likelihood of compliance. They should be thoroughly educated regarding anticipated responses of the patient’s body as spinal shock resolves.

45. Why is it important to identify whether or not spinal shock has resolved?

46. In persons with UMN injuries, what changes occur in bowel and bladder function, indicating that spinal shock is resolved?

**UMN Emptying Patterns**

Bowel and bladder function are dependent on the level and type of injury.

Indicate whether the following statements are True or False.

47. ______ Injuries below the T1 level of the spinal cord are considered LMN injuries.

48. ______ Injury to the cauda equina or conus medullaris are LMN injuries.

49. ______ The conus medullaris is found at approximately the T12-L1 level of the spinal column.

50. ______ UMN injuries occur within the central nervous system.

51. ______ LMN injuries occur within the peripheral nervous system.

52. ______ An injury to the sacral level of the spinal cord will result in a UMN injury.
53. Complete this grid, describing key characteristics for the following neurogenic emptying patterns.

<table>
<thead>
<tr>
<th>Problem/Characteristic</th>
<th>UMN or LMN?</th>
<th>Voluntary motor loss?</th>
<th>Sensory loss?</th>
<th>Bulbocavernosus reflex? Hypo- or hyper-active?</th>
<th>Emptying pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reflexive emptying without voluntary recognition or control</td>
</tr>
<tr>
<td>Autonomous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Leakage and smearing</td>
</tr>
<tr>
<td>Motor paralytic</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory paralytic</td>
<td>N/A</td>
<td>Yes</td>
<td></td>
<td></td>
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</tbody>
</table>

In order to develop an easy and consistent approach to bowel and bladder management, make sure to develop the programs in coordination with each other. There is a significant amount of overlap between the two; mixed messages are very confusing to the patient and caregivers. Compare these foundational principles for bowel and bladder programs. They apply to all programs and are the base from which other interventions begin.

<table>
<thead>
<tr>
<th>Bladder</th>
<th>Bowel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avoid overfilling.</strong> It can lead to bladder wall trauma, overdistention, reflux, loss of contractility, and can contribute to dysreflexia.</td>
<td><strong>Avoid overfilling.</strong> It can lead to bowel wall trauma, overdistention, and loss of contractility. It also can contribute to dysreflexia.</td>
</tr>
<tr>
<td><strong>Maintain adequate hydration.</strong> It will decrease the risk of UTIs. Establishing a regular pattern of intake helps to predict output.</td>
<td><strong>Maintain adequate hydration.</strong> It helps to keep stool soft and moving through the bowel.</td>
</tr>
<tr>
<td><strong>Control factors contributing to dysfunction,</strong> such as medications, functional limitations, infections, etc.</td>
<td><strong>Control factors contributing to dysfunction,</strong> such as impactions, overly-soft stool, medications, etc. Start with a clean bowel.</td>
</tr>
<tr>
<td><strong>Maintain skin integrity.</strong></td>
<td><strong>Maintain skin integrity.</strong></td>
</tr>
<tr>
<td><strong>Track intake and output</strong> to ensure they are adequate and to establish patterns.</td>
<td><strong>Track intake and output,</strong> as well as stool frequency and amount, to ensure they are adequate and to establish patterns.</td>
</tr>
</tbody>
</table>
Establish a schedule and stick to it. A schedule or pattern should be established for intake and output.

Establish a schedule and stick to it. The bowel is very trainable and responds faster and more easily on a routine schedule.

Use an upright position for emptying. This allows gravity, physics, and the body’s musculature to work with you.

Use an upright position for emptying. This allows gravity, physics, and the body's musculature to work with you.

Maintain a nutritional diet that is high in fiber.

Encourage activity to promote movement of food through the GI tract.

(The Rehab Nursing Series™ provides additional training on bladder management in the course *Gotta Go Right Now! Bladder Management in Rehabilitation*. Find information at [www.rehabclassworks.com/Bladder.htm](http://www.rehabclassworks.com/Bladder.htm).

You can find additional training on bowel management in the course *Full of It! Bowel Management in Rehabilitation*. Information on this course is available at [www.rehabclassworks.com/Bowel.htm](http://www.rehabclassworks.com/Bowel.htm).

**Bowel Program**

Interventions for management of elimination following spinal cord injury vary according to residual deficits and recovery pattern.

54. Is digital stimulation more appropriate for UMN or for LMN bowel problems?

A thorough understanding of laxatives and their effects is critical to appropriate use in the management of bowel elimination. The following table is a guide to basic groups of laxatives. Be sure to look up medications with which you are unfamiliar!
55. Complete this grid, matching the product with its description.

<table>
<thead>
<tr>
<th>Laxative Type</th>
<th>Actions and Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) ________________</td>
<td>Attracts and retains water in the intestinal lumen, increasing intraluminal pressure and causing the release of cholecystokinin. Will potentially alter fluid and electrolyte balance, especially the sulfate salts.</td>
</tr>
<tr>
<td>(magnesium sulfate, magnesium hydroxide, magnesium citrate, sodium phosphate, sodium phosphate/biphosphate enema)</td>
<td></td>
</tr>
<tr>
<td>b) ________________</td>
<td>Directly affects the intestinal mucosa by stimulating the myenteric plexus. Alters water and electrolyte secretion. Bile must be present in order for phenolphthalein to work. Castor oil may be preferred if more complete emptying is required.</td>
</tr>
<tr>
<td>(cascara, senna, phenolphthalein, bisacodyl tablets, casanthranol, bisacodyl suppositories, castor oil)</td>
<td></td>
</tr>
<tr>
<td>c) ________________</td>
<td>Retains water in the stool, causing mechanical distention.</td>
</tr>
<tr>
<td>(methylcellulose, psyllium, polycarbophil)</td>
<td></td>
</tr>
<tr>
<td>d) ________________</td>
<td>Decreases absorption of water in the colon and softens stool. May interfere with the absorption of fat-soluble vitamins.</td>
</tr>
<tr>
<td>(mineral oil)</td>
<td></td>
</tr>
</tbody>
</table>

Bladder Program

A balanced and predictable intake contributes to a predictable output pattern. When intake patterns are regulated according to the patient’s preferences and lifestyle, it is easier to successfully develop a schedule for the use of intermittent catheterization to empty the bladder and avoid overdistention. As spasticity develops, medications may be needed to allow the bladder to fill between catheterizations.

56. What strategy should be used to prevent bladder overdistention during early acute care when urinary volumes often exceed 2 L/day?

57. Should patients use sterile technique or clean technique for self-catheterization?
Caution!

Patients should be taught about the impact of diuretic foods and alcohol on bladder management strategies. They particularly should be aware of the fact that, after the resolution of spinal shock, the risk of reflux increases if bladder emptying does not occur more frequently following the ingestion of these products. They also should be cautioned about the effects of over-the-counter medications, such as pseudoephedrine, on bladder function.

Regular follow-up and monitoring of kidney and bladder function is necessary in patients with reflex neurogenic bladders. The risk of reflux and eventual kidney damage is real and, if caught early, can prevent further impact on the kidneys.

Maximizing Physical Function

One of the most important activities about which patient and caregivers should learn early in rehabilitation is range of motion. They should be taught to do it regularly and correctly, supporting the joint and avoiding rough handling of the extremity.

58. Why is the risk of pathological fractures significant following SCI?

Wheelchairs should be fitted to the patient, considering the following:

- Body shape and size
- Functional needs
- Healthcare needs
- Environment in which the patient will be using the chair
Spasticity

Spasticity must be balanced carefully following SCI. Some spasticity is helpful in preventing bone loss and maintaining circulation and muscle mass. Too much spasticity limits functional activity, causes pain, and potentially can put the patient at risk for injury. ROM, proper positioning, and medications, such as baclofen, are used to decrease spasticity. Baclofen may be given orally or administered intrathecally via an implantable spinal infusion pump.

As spasticity increases following the resolution of spinal shock, patients may need to be followed until spasticity levels stabilize (for the 1st year or so of recovery), so that medications and therapeutic activities can be adjusted. This is particularly important if spasticity becomes painful or interferes with functional activities or elimination.

59. List three side effects to watch for when administering baclofen, especially when the medication is started.

Functional Skills

For many following SCI, independence is dependent on the ability to be creative, to problem-solve, and to access appropriate equipment. The next table is a summary of anticipated function at each level of injury (NLI) following complete SCI. (Patients with incomplete injuries may regain more function.)

<table>
<thead>
<tr>
<th>NLI</th>
<th>Residual Motor Function</th>
<th>Anticipated Functional Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1-2</td>
<td>Ventilator-dependent; some movement of head and neck</td>
<td>Dependent, though may control wheelchair and environment with breath or head control equipment</td>
</tr>
<tr>
<td>C3-4</td>
<td>Good head and neck control; may require a ventilator part of the time</td>
<td>Dependent, though may control wheelchair and environment with breath or head control equipment</td>
</tr>
<tr>
<td>C5</td>
<td>Full head, neck, diaphragm, and shoulder control; some elbow flexion</td>
<td>Able to feed and groom self with use of adaptive aids; participates in upper extremity dressing; requires assistance for most other self-care; will require an electric wheelchair with adapted hand controls or manual chair with wheel rim projections</td>
</tr>
<tr>
<td>Level</td>
<td>Function Details</td>
<td>Ability to Perform Activities</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>C6</td>
<td>Full head, neck, diaphragm, and shoulder control; strong elbow flexion; some wrist extension, allowing tenodesis</td>
<td>Able to feed, groom, bathe, and dress upper body using adaptive aids; participates in lower-body dressing, transfers, and bowel/bladder programs; able to propel manual wheelchair on level surfaces</td>
</tr>
<tr>
<td>C7</td>
<td>Full head, neck, diaphragm, and shoulder control; elbow flexion/extension; wrist flexion/extension; some finger control</td>
<td>Able to feed, bathe, dress upper body, and perform most transfers independently; able to groom, dress lower body, and perform bowel care with assistive devices; may require assistance with bladder care; able to propel manual wheelchair on most surfaces</td>
</tr>
<tr>
<td>C8-T1</td>
<td>Full head, neck, diaphragm, and moderate-to-full arm function, with moderate-to-full finger control</td>
<td>Independent in feeding, grooming, bathing, and dressing; able to perform transfers and bowel/bladder care; independent in use of manual wheelchair</td>
</tr>
<tr>
<td>T2-12</td>
<td>Full upper extremity and head control, with increasing trunk control</td>
<td>Independent in self-care, though may require equipment for bowel/bladder management and bathing; able to manage manual wheelchair well</td>
</tr>
<tr>
<td>L1-5</td>
<td>Full control of upper body, with increased control of hip, knee, ankle</td>
<td>Independent in self-care; able to ambulate with long leg braces; may require full- or part-time use of wheelchair</td>
</tr>
<tr>
<td>S1-5</td>
<td>Full control of upper body with moderate-to-full control of lower extremities</td>
<td>Independent in self-care; able to ambulate with minor equipment</td>
</tr>
</tbody>
</table>

Tenodesis is very important to functional independence in the patient with a C5-6 injury and much effort is spent on getting that motion to return. It is important to assist these patients with range of motion to the wrist, but to avoid overstretching finger flexor/extensor tendons, which may limit the function of tenodesis.

Try it! Let your fingers hang limp from your wrist. Keeping your fingers relaxed flex your wrist and note the grasp that occurs.
Sexuality

Sexual expression is part of who we are. SCI does serious damage to self-esteem and the ability to express one's sexuality. Relationships are at risk following SCI, as they are following most disabilities. It is important to understand your own views on sexuality and to respect the patient's choices when discussing it with him or her.

Indicate whether the following statements are True or False.

60. ______ UMN lesions leave males without the ability to achieve any type of erection.

61. ______ LMN lesions make it impossible to have reflexogenic erections, though weak psychogenic erections are possible.

62. ______ Fertility is diminished in males following SCI.

63. ______ Sperm can be obtained from males using electrostimulation for artificial insemination in specialty fertility centers.

64. ______ Reflexogenic erections are the result of direct physical contact.

65. ______ Psychogenic erections are the result of direct physical contact.

66. ______ Males who have reflexogenic erections always are able to ejaculate.

67. ______ It is advised that bowel and bladder care be done prior to sexual activity to decrease the risk of reflex emptying.

68. ______ Females with UMN lesions will not be able to participate in vaginal intercourse.

69. ______ Fertility is unchanged in females following SCI.

70. ______ Pregnancy should be handled carefully to prevent damage to the fetus from medications and to decrease the risk of complications in the mother with SCI.

71. ______ Autonomic dysreflexia always is associated with sexual activity, therefore direct stimulation of the sexual organs should be avoided.
As always, support and encouragement to explore mutually-pleasurable activities should be encouraged. Patients may need more assistance in problem solving motor skill limitations and in planning for sexual activities to avoid accidental bowel emptying or triggering dysreflexia. Education must include information about birth control and pregnancy risks so that female patients can make educated choices.

Patients who are in need of more detailed information or who are interested in fertility issues should be referred to appropriate sources.

(The Rehab Nursing Series™ provides additional training on sexuality in the course A Little Romance? Providing Sexuality Education & Counseling in Rehabilitation. You can find information at www.rehabclassworks.com/Sxrehab.htm.)

Risk for Injury

Survival in the community often is dependent on the attitude of the patient, the environment, equipment and resources, and the ability to move around in the community. Without the ability to move around in the community, opportunities for work and education are severely limited, as are those for social and spiritual support and recreation. While many adaptations to the environment are easily affordable, transportation is not and may be a limiting factor. It is important to educate the patient about the resources available in the community and to assist in recruiting social and community support prior to discharge.

Safety

Motor and sensory impairments increase the risk of injury following SCI, whether from bumping insensitive toes on the furniture, falling out of the chair, or slowly crossing busy streets. Each patient should be evaluated for potential risks in the community and be educated to avoid or manage them.
72. Can you identify at least five things that most patients with motor/sensory impairment should be taught regarding safety in the community prior to return to the community.

(The Rehab Nursing Series™ provides additional training on this population in the course Rehabilitation of Spinal Cord Injury. You can find information at www.rehabclassworks.com/SCI.htm.)

Review the Appendix at the end of this chapter.

On the computer: Complete the Care of Patients:
CVA, TBI, & SCI quiz, page 100.

On completion of the quiz, go to page 164 in this workbook to start the next unit.

Appendix: Dysreflexia Algorithm

**Presents with dysreflexia symptoms**

**Elevated BP?**
- Yes: Indwelling Urinary catheter?
  - Yes: -Instill Lidocaine jelly if immediately available
  - No: Monitor BP for 2 hours
  - Yes: Monitor BP for 2 hours
  - No: **STOP**

**Elevated BP?**
- No: Referral to consultant may be needed

**Referral to consultant may be needed**

**Elevated BP?**
- Yes: -Instill Lidocaine jelly if immediately available
  - No: Monitor BP for 2 hours

**Monitor BP for 2 hours**

**Elevated BP?**
- Yes: Admit to hospital for BP control, ID of causes
  - Yes: -Begin rapid onset, short-acting antihypertensive
  - No: **STOP**

**Admit to hospital for BP control, ID of causes**

**Attempt to empty rectum**

**Rectum empty?**
- Yes: -Instill Lidocaine into rectum -Wait 2 minutes
  - No: Monitor BP for 2 hours

**Monitor BP for 2 hours**

**Elevated BP?**
- Yes: BP above 150 mm Hg systolic?
  - Yes: -Begin rapid onset, short-acting antihypertensive
  - No: Symptomatic hypotension?
    - Yes: Lay flat, elevate legs
    - No: Yes:

**Symptomatic hypotension?**

**BP above 150 mm Hg systolic?**
- Yes: -Begin rapid onset, short-acting antihypertensive
  - No: Symptomatic hypotension?
    - Yes: Lay flat, elevate legs
    - No: Yes:

**Symptomatic hypotension?**

**BP above 150 mm Hg systolic?**
- Yes: -Begin rapid onset, short-acting antihypertensive
  - No: Symptomatic hypotension?
    - Yes: Lay flat, elevate legs
    - No: Yes:
Summary of Recommendations From Clinical Practice Guidelines

1. Recognize the signs and symptoms of autonomic dysreflexia.

2. **Check the individual’s blood pressure.**
   - A sudden, significant increase in both the systolic and diastolic blood pressure above their usual levels is frequently associated with bradycardia. An individual with SCI above T6 often has a normal systolic blood pressure in the 90-110 mmHg range. Therefore, a blood pressure of 20-40 mmHg above baseline may be a sign of autonomic dysreflexia.
   - Systolic blood pressure elevations more than 15-20 mmHg above baseline in adolescents with SCI or more than 15 mmHg above baseline in children with SCI may be a sign of AD.

3. If a pregnant woman with a spinal cord injury at T6 or above presents with signs and symptoms of autonomic dysreflexia, consider referral to an obstetric health care provider under the following circumstances:
   - Determination of choice of antihypertensive medication
   - Persistent hypertension after resolution of the acute autonomic dysreflexia episode
   - Persistent symptoms of autonomic dysreflexia despite acute care measures
   - Life-threatening autonomic dysreflexia
   - Autonomic dysreflexia episode occurring in the third trimester of pregnancy
   - Hypotension requiring pharmacological treatment
   - First episode of autonomic dysreflexia during the pregnancy
   - Presence of vaginal bleeding or suspicion of labor
   - Decisions to be made about long-term medication use
   - Unclear about the causes, signs, and symptoms, despite a normal blood pressure

4. If signs or symptoms of AD are present, but the blood pressure is not elevated and the cause has not been identified, refer the individual to an appropriate consultant depending on symptoms.

5. If the blood pressure is elevated, **immediately sit the person up** if the individual is supine.

6. Loosen any clothing or constrictive devices.

7. Monitor the blood pressure and pulse frequently.

8. Quickly survey the individual for the instigating causes, beginning with the urinary system.

9. If an indwelling urinary catheter is not in place, catheterize the individual.

10. Prior to inserting the catheter, instill 2 percent lidocaine jelly (if immediately available) into the urethra and wait 2 minutes, if possible.

11. If the individual has an indwelling urinary catheter, check the system along its entire length for kinks, folds, constrictions, or obstructions and for correct placement. If a problem is found, correct it immediately.

12. If the catheter appears to be blocked, gently irrigate the bladder with a small amount (10-15 cc) of fluid, such as normal saline at body temperature.
   - Irrigation should be limited to 5-10 mL for children under 2 years of age and to 10-15 mL in older children and adolescents. Avoid manually compressing or tapping on the bladder.

13. If the catheter is draining and the blood pressure remains elevated, proceed with recommendation 18.

14. If the catheter is not draining and the blood pressure remains elevated, remove and replace the catheter.

15. Prior to replacing the catheter, instill 2 percent lidocaine jelly (if immediately
available) into the urethra and wait 2 minutes, if possible.

16. If difficulties arise in replacing the catheter, consider attempting to pass a coudé catheter or consult a urologist.

17. Monitor the individual’s blood pressure during bladder drainage.

18. If acute symptoms of autonomic dysreflexia persist, including a sustained elevated blood pressure, suspect fecal impaction.

19. If the elevated blood pressure is at or above 150 mmHg systolic, consider pharmacologic management to reduce the systolic blood pressure without causing hypotension prior to checking for fecal impaction. If the blood pressure remains elevated but is less than 150 mmHg systolic, proceed to recommendation 22.

20. Use an antihypertensive agent with rapid onset and short duration while the causes are being investigated.

21. Monitor the individual for symptomatic hypotension.

22. If fecal impaction is suspected and the elevated blood pressure is less than 150 mmHg systolic, check the rectum for stool, using the following procedure:
   - With a gloved hand, instill a topical anesthetic agent such as 2 percent lidocaine jelly generously into the rectum.
   - Wait 2 minutes if possible for sensation in the area to decrease.
   - Then, with a gloved hand, insert a lubricated finger into the rectum and check for the presence of stool. If present, gently remove, if possible.
   - If autonomic dysreflexia becomes worse, stop the manual evacuation. Instill additional topical anesthetic and recheck the rectum for the presence of stool after approximately 20 minutes.

23. If the precipitating cause of the AD episode has not yet been determined, check for less frequent causes. The individual may first need to be admitted to the hospital for monitoring to maintain pharmacological control of the blood pressure. Particularly if there is a poor response to the treatment specified above.

24. Following an episode of autonomic dysreflexia, instruct individuals who are outpatients to monitor symptoms and blood pressure for at least 2 hours after resolution of the episode to make sure that it does not reoccur.
   - Educate the individual to seek immediate medical attention if it reoccurs.
   - Monitor inpatients closely for at least 2 hours, as deemed necessary by the healthcare provider.
   - Seek the pregnant woman’s obstetrical-care provider for evaluation.

25. Consider admitting the individual to the hospital for monitoring to maintain pharmacologic control of the blood pressure, and to investigate other causes:
   - If there is poor response to the treatment specified above.
   - If the cause of the dysreflexia has not been identified.
   - If there is suspicion of an obstetrical complication.

26. Document the episode in the individual’s medical record, including:
   - Presenting signs and symptoms and their course.
   - Treatment instituted.
   - Recordings of blood pressure and pulse.
   - Response to treatment.

Evaluate effectiveness of the treatment according to the level of outcome criteria reached:
   - The cause of the autonomic dysreflexia episode has been identified.
   - The blood pressure has been restored to normal limits for the individual (usually 90 to 110 systolic mmHg for a tetraplegic person in the sitting position).
   - The pulse rate has been restored to normal limits.
   - The individual is comfortable, with no signs or symptoms of autonomic dysreflexia, of increased intracranial pressure, or of heart failure.
   - An education plan has been completed and included preventive and emergency management guidance.
27. Once the individual with spinal cord injury has been stabilized, review the precipitating cause of the AD episode with the individual, family members, significant others, and care givers. This preventive process entails:
   • Adjusting the treatment plan to ensure that future episodes are recognized and treated to prevent a medical crisis or, ideally, are avoided altogether.
   • Discussing autonomic dysreflexia during the individual’s education program, so that he or she will be able to minimize risks known to precipitate AD, solve problems, recognize early onset, and obtain help as quickly as possible.
   • Providing the individual with education about the prevention and treatment of autonomic dysreflexia at the time of discharge that can be referred to in an emergency.

28. Schedule detailed medical evaluations for individuals with recurrent autonomic dysreflexia.
CARE OF PATIENTS: OTHER NEUROLOGICAL DIAGNOSES

This unit of the workbook contains one chapter, discussing a selection of other neurological diagnoses that are found in persons needing rehabilitation care. It addresses Domain II (Functional Health Patterns: theories, physiology, assessment, standards of care, and interventions in individuals with injury, chronic illness, and disability across the lifespan).

There are many neurodegenerative problems that may bring patients to rehab. Work smarter by looking up information on those diseases and syndromes with which you are unfamiliar. As you work your way through this chapter, think about the rehabilitation care needed by these populations of patients.

On the computer: Return to the Main Menu to start this unit, Care of Patients: Other Neurological Diagnoses, pages 1-2
Chapter 17

Care of Patients: Other Neurological Diagnoses

The clientele who can benefit from rehabilitation is increasing... (Ruth Stryker, 1996). Rehabilitation nurses care for patients with a wide variety of neurological diagnoses.

Chapter Highlights

- There are many presentations of multiple sclerosis. Because it affects both upper and lower motor neurons, neurological deficits are mixed.

- Amyotrophic lateral sclerosis is a rapidly-progressive disease. Rehabilitation focuses on maintaining function and quality of life.

- Guillain-Barré syndrome is a rapidly-progressive disease that can advance quickly to respiratory compromise. Most people recover significantly. Rehabilitation supports recovery and functional return.

- Post-polio syndrome has increased in incidence as polio survivors become older, requiring proactive care to prevent loss of function.
What Is Your Job in This Chapter?

The mix of patients receiving rehab care has been changing as some patient
groups have moved primarily to outpatient and home health settings and the
principles of rehabilitation have been applied to more diverse groups throughout
the continuum. However, patients with trauma, neurological, respiratory, and
cardiac disease remain the mainstay of the rehabilitation population.

In this chapter, your job is to briefly review a few selected neurological
diagnoses with an emphasis on pathophysiology and special needs. Basic
rehabilitation principles apply to all of these diagnoses.

Multiple Sclerosis (MS)

The prevalence of MS is 350,000-500,000 persons
in the US and over 2 million worldwide. It is a
major cause of disability and adversity in young and
middle-aged adults.

Medications are used to manage the disease and
decrease the risk of flares or exacerbations. Many
of these medications are injectable and require
significant responsibility on the part of the patient
maintaining the regimen.

1. What is the purpose of using anti-inflammatories during an
   exacerbation of MS?

2. Identify at least three things patients with MS should avoid to
decrease the risk of exacerbation.

 Uhthoff Phenomenon

In persons with MS, heat in
the form of a hot
environment, hot meal, or
hot bath causes temporary
increase in MS symptoms
(e specially visual
symptoms). This tends to
diminish over the next 24
hours.

Luzzio, 2017
Fatigue is one of the primary reasons that those with MS withdraw from work and social interaction.

3. What interventions on the part of the rehabilitation team help a patient with MS manage fatigue?

4. What special considerations need to be made while evaluating and managing elimination problems?

5. Why do you think caffeinated beverages should be avoided in persons with bladder problems secondary to MS?

Amyotrophic Lateral Sclerosis (ALS)

Amyotrophic lateral sclerosis, or Lou Gehrig's disease, is an aggressive disease of the motor neurons. Only one medication has been found to provide neuroprotective action: riluzole. The patient should be provided with data regarding the efficacy and side effects of the medication.

6. What is the primary cause of death with ALS?
7. Pain is typically caused by cramps, spasticity, immobility, and contractures. What interventions do you think are most likely to be effective?

8. What issues are very important to address in a timely and supportive manner with patients and their families?

Guillain-Barré Syndrome (GBS)

Guillain-Barré syndrome typically occurs within 3-4 weeks of an infection. Sensory loss is variable; pain is common. Cranial nerves can be impacted as can the autonomic nervous system. Patients must be monitored closely during acute onset to prevent life-threatening complications.

9. What bodily system should be most closely monitored in a patient with GBS?

10. Circle the correct choice: Recovery from GBS is often (complete/incomplete).

Unscramble the letters to fill in the blanks.

11. Management of the patient following acute onset of GBS should focus on minimizing complications of ____________________________ (ymolitimbi).

12. During early recovery and rehabilitative care, the patient should be monitored for early signs of respiratory fatigue, such as ____________________________ (abeeehnrssts).

13. The patient should not be ____________________________ (dstorveresse) during recovery periods and should be monitored for signs of regression.
**Post-Polio Syndrome (PPS)**

Rehabilitation that includes tailored exercises has shown to have significant benefit on muscle endurance, exertion, and depression levels in persons with PPS.

14. Identify at least three interventions to maintain or improve function in persons with post-polio syndrome.

15. **True** or **False**? Strengthening exercises should not cause fatigue.

**Parkinson’s Disease (PD)**

Researchers are actively trying to find ways to prevent and control this disease process. For more information on the research and care of patients with PD, go to [www.parkinson.org](http://www.parkinson.org) or [www.apdaparkinson.org](http://www.apdaparkinson.org).

A wide variety of medications are used to control the symptoms of PD, but as of yet there are no products that cure the disease. Medical management has improved a great deal in recent years, and medications can be balanced to minimize side effects. Remember to follow medication schedules closely and to time medications to maximize the impact for daily activities.

16. List three side effects of PD medications that influence a patient’s healthcare.
17. What does the nurse need to remember about administering medications to patients with PD?

It has been noted that regular and consistent exercise improves function, endurance, memory, and elimination for patients with PD. Warm baths, massages, and stretching also are helpful. Patients should be encouraged to ambulate with:

- A wide base of support
- Swinging arms
- Feet lifted high, as in marching
- Long, lengthy strides

If the patient should freeze in place, avoid trying to pull forward, because this may lead to falls. Instead, assist to rock side-to-side, raise arms, and step backward; then move forward.

Nutrition may become a problem as the disease progresses and it becomes more difficult to eat. Drooling also impacts hydration. It often is helpful to provide small, frequent, high-fiber meals with frequent fluids throughout the day.

**Cerebral Palsy (CP)**

Assessment of those with CP should reflect the growth, development, and functional skills of each individual. New problems and symptoms are likely to be expressed as the child matures and grows. An emphasis on neurodevelopmental and sensory therapies is important to supporting and normalizing growth and development as much as possible. Community integration is essential for successful habilitation.
18. What is the purpose of positioning devices (special seating, wheelchairs, orthotics, braces, standing frames, etc.)?

19. Identify the causes and interventions for nutrition problems in children with cerebral palsy.

20. Describe types of communication problems faced by this population and strategies to enhance communication skills.

**Spina Bifida (SB)**

Spina bifida results from the failure of the posterior laminae of the vertebrae to fuse in the lower spine, exposing neural tissue.

21. Describe common problems in mobility and positioning for patients with spina bifida and strategies to address them.
22. What determines the severity of cognitive problems in persons with spina bifida?

23. What type of nutritional problem are these patients at risk for, and what are the adverse consequences of this problem?

24. Describe expected bowel problems and intervention strategies.

25. Describe expected bladder problems and management strategies.

On the computer: Complete the Care of Patients: Other Neurological Diagnoses quiz, page 18.

On completion of the quiz, go to the next page in this workbook and start the next unit, Care of Patients: Other Diagnoses.
CARE OF PATIENTS: OTHER DIAGNOSES

This unit will briefly review a few select non-neurological diagnoses with an emphasis on rehabilitative care and special needs. It addresses Domain II (Functional Health Patterns: theories, physiology, assessment, standards of care, and interventions in individuals with injury, chronic illness, and disability across the lifespan).

- Amputation
- Arthritis
- Chronic Pain
- Osteoporosis
- Cardiopulmonary
- Cancer
- Burns

The principles of rehabilitation care apply to all of these patient populations.

You may proceed in this order or select the diagnosis you prefer to study. There are matching sections in the computer course for each of the above health issues. Simply go to the correct page in each to pursue your selection.

On the computer: Return to the Main Menu to start this unit, Care of Patients: Other Diagnoses, pages 1-2
CHAPTER 18

CARE OF PATIENTS: OTHER DIAGNOSES

Rehabilitation is not just for the young or for those with neurological problems. Quality of life and functional ability are important to each and every one of us.

What Is Your Job in This Chapter?

Rehabilitation can improve the quality of life for patients with any number of health issues. Your job in this chapter is to review the rehabilitation needs and care of patients with non-neurological diagnoses, identifying how rehabilitation facilitates quality of life and/or eases the burden of caring for a patient with diminishing function.

On the computer: Care of Patients: Other Diagnoses/Amputation, pages 3-10

Chapter Highlights

- Rehabilitation of patients with these health problems often requires management of pain, energy expenditure, and cardiopulmonary tolerance to activity.
- Quality of life can be improved through the use of equipment and care strategies to decrease the burden of care.
Care of Patients: Amputation

Amputation generally is done to remove a diseased, damaged, or non-functioning body part. As such, it should be viewed as a reconstructive procedure. The level of amputation and the specific techniques used during surgery have a significant impact on function by impacting the functioning, fit, and comfort of the prosthesis.

Comorbidities

Many amputations can be avoided by not smoking, exercising, and managing diabetes.

1. Describe the impact of comorbidities such as PVD/PAD and DM on the healing of amputation wounds.

Dressing for Residual Limbs

Postoperative dressings are utilized to support wound healing. Wound healing is enhanced by ensuring appropriate resources are available and limiting factors are controlled.

2. Identify resources needed for wound healing.

3. List limiting factors that should be managed.
Figure-8 wraps, stump shrinkers, and removable rigid dressings are used for stump shaping and decreasing edema following amputation.

4. Why is it important to reduce edema and properly shape the residual limbs?

5. What things do you want to remember when using a figure-8 wrap?

Adjustment to Amputation

Loss of a body part will result in changes in body image, grief, and mourning. Two particularly hard times for patients are when they return home, no longer surrounded by healthcare providers, and when they are being fitted with a prosthesis (which puts focus on the missing limb).

6. List at least three interventions you can use to assist a patient to cope with the loss of a limb.

7. How will you address the concerns of patients with PVD and/or DM who have lost one leg and are fearful of losing the other?

Residual Limb Care

Patients should practice and develop skills and habits of cleaning and inspecting both the residual limb and the remaining limb daily.

- Gently clean with soap and water and pat dry.
- A mirror may need to be used to adequately see all surfaces.

Immediate action should be taken if a skin issue is noted.

- Any reddened area that does not resolve in 15-20 minutes requires avoidance of additional pressure—do not wear the prosthesis—and follow-up with healthcare provider within 2 days.

Lovegreen et al, 2016
**Risk for Contracture**

Contractures are a concern following amputation. Development of contractures can significantly impair function.

8. List three strategies you will teach a patient with an above-knee amputation to avoid the development of hip contractures.

9. List three strategies you will teach a patient with a below-knee amputation to avoid the development of knee contractures.

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**Phantom Limb Pain**

Severe phantom limb pain problems generally affect a small portion of total patients with amputation. Relief may be obtained with:

- Pain medications or adjuvant medications, such as antidepressants, anticonvulsants, and/or benzodiazepines

- Noninvasive therapies such as massage, desensitization with tapping and pressure, nerve stimulation (TENS), mirror therapy (watching the intact limb move in a mirror and imagining that the missing limb moving), acupuncture, biofeedback, hypnosis, and virtual reality training (exercising the phantom limb using augmented video gaming)

- Invasive procedures such as injections, spinal cord stimulation, nerve blocks, or brain stimulation

Ertl, 2016; Lovegreen, Murphy, Smith, Stevens, & Webster, 2016
Phantom limb sensations and phantom limb pain are normal occurrences following the severing of nerves during an amputation.

10. What is the difference between phantom limb sensations and phantom limb pain?

11. List three things you should know about your patient and his/her prosthesis in order to work effectively with the team.

Prosthetic Time!

Age has a definite influence on function and adaptation following an amputation. Children will require changes in the prosthesis as they grow and develop. Older adults will have to manage mobility within the parameters of other health issues. Cardiopulmonary disease and deconditioning may make mobility with a prosthesis challenging due to the increased amount of effort required for walking.

12. Limb volume changes directly affect the fit of the prosthesis. What are two risks when the socket does not function correctly?

Technology continues to refine prosthetics, resulting in economical options through 3-D printing; limbs that can sense pressure, shape, and texture; and currently-evolving brain control technology to create fully bionic limbs.

Zevala, 2017
Osteoarthritis

Osteoarthritis (OA), also known as degenerative joint disease, is the most common form of arthritis and is known as the wear-and-tear disease of the aged. Most older adults develop osteoarthritis in at least some joints. However, symptoms range from mild to severe; for many with mild disease, it has little impact on functional activities.

- **Primary OA** develops from genetic and aging changes, obesity, and smoking.
- **Secondary OA** is related to joint trauma and other musculoskeletal conditions including rheumatoid arthritis.

(Remember that there are many forms of arthritis, including gout, systemic lupus erythematosus, scleroderma, ankylosing spondylitis, and others, that are supported by rehabilitative care throughout the continuum.)

Early symptoms include deep aching pain that increases with activity. Symptoms progress to include decreased range of motion, stiffness during rest that includes morning stiffness lasting less than 30 minutes, surrounding muscle atrophy, and loss of function.

Hsieh, Watson, & Mao, 2016; Lozada, 2017
13. What is the most common cause of functional limitation for a person with osteoarthritis?

14. Identify at least three nonsurgical treatment options for management of osteoarthritis.

15. Why would a total joint replacement be done in a patient with osteoarthritis?

**Joint Replacement**

Joint replacements can provide relief from pain, enhance mobility, and improve functional independence. Laminectomy or spinal fusion may help those with osteoarthritis of the spine. Other health issues may limit eligibility for joint replacement interventions.

16. List at least three precautions that should be taken by patients who have undergone posterior-approach total hip replacements.

DVT and PE are the most frequent complications of joint replacement surgery. Prophylaxis is highly recommended. Complaints of numbness or paresthesia may indicate nerve impingements.

17. **True** or **False**? Patient assessment for blanching, pain, edema, and a positive Homan’s sign is a highly accurate method of identifying VTEs.
Rheumatoid Arthritis

As with most forms of arthritis, patients with RA must live with chronic pain. There are a wide variety of reasons for chronic pain, and its management is critical to quality of life. The severity of the disease varies greatly, sometimes having periods of remission and exacerbation. Early and aggressive disease management is necessary because irreversible joint injury can occur as early as the first 2 years of the disease.

Hsieh, Watson, & Mao, 2016

There are many different types of arthritis, some more limiting than others. (For more information, visit the Arthritis Foundation at www.arthritis.org.)

RA is managed by controlling inflammation, slowing joint destruction, controlling pain, and adapting functional activities.

Strategies for care include:

- Resting inflamed joints (splints)
- Systemic rest (naps)
- Joint protection during activity
- Exercise
- Pharmacological therapy
- Psychological support
Health and Functional Maintenance

Health maintenance may be a challenge for some patients with rheumatoid arthritis due to the effects of the disease and sometimes complicated and expensive treatment regimens.

Here are some key points to keep in mind:

- Assist the patient to stay on top of pain. Failure to manage pain significantly impacts quality of life.

- Develop strategies to balance rest and activity, making sure to get adequate nighttime rest. Lifestyle changes may be necessary and environments may need to be modified.

- Teach strategies to manage stress and fatigue. Exercise is an important management strategy for both.

- Teach to manage the effects of the disease and side effects of medications.

- Encourage to eat a balanced diet and control weight.

- Encourage to participate in support groups or get counseling. Dealing with the ongoing pain and functional limitations of rheumatoid arthritis is difficult. Depression is common and may require medication.

- Sexual counseling may be helpful to facilitate adaptation to role changes, physical limitations, and psychological responses.

- Vocational rehabilitation may be necessary to identify vocational interests that maximize abilities and assist in maintaining independence.

- Environmental adaptation can increase productivity and independence.
A Balance of Rest & Activity

Rheumatoid diseases (as well as others) limit endurance and energy levels. Exercises that increase endurance are beneficial to those with rheumatoid arthritis. However, energy conservation still may be necessary.

18. List at least five energy-conservation strategies you can teach your patients with endurance limitations (not limited to patients with RA).

Living Life

There are hundreds of ways to facilitate independence through the use of technology and adaptive equipment so that patients can live life and still protect their joints.

19. Describe instructions you might give your patient for joint protection.

Review your understanding of rheumatoid arthritis and osteoarthritis by comparing them here. Label each symptom listed below as RA or OA to identify the disease process with which it is associated.

20. _____ It primarily affects weight-bearing joints.
21. _____ It primarily affects small joints.
22. _____ Joint involvement is symmetrical.
23. _____ Accompanying symptoms include fatigue and weight loss.
24. _____ Affects more females more than males, at a 3:1 ratio.
25. _____ Synovium is inflamed.
26. _____ Ligaments and tendons eventually become inflamed, stiff, and shortened.
27. _____ It is slowly progressive.
28. _____ It is a degenerative disease process.
29. _____ Trauma maybe a contributing factor.
30. _____ Cartilage detaches from joint.
31. _____ Pain and stiffness occur at rest and decrease with activity.
32. _____ Pain occurs with activity and is relieved by rest.

**On the computer: Care of Patients:**
*Other Diagnoses/Chronic Pain Syndrome, pages 21-23*

### Chronic Pain Syndrome

The perception of pain is a complicated process influenced by physiological, emotional, and cultural responses. It can be described or classified in many ways, such as acute or chronic, malignant or non-malignant.

*Provide at least one example of each type of pain.*

33. **Neuropathic:**

34. **Nociceptive:**
Managing Pain

Pain that lasts longer than 3-6 months is considered chronic. Chronic pain is cyclic, with compensation leading to more pain, leading to more compensation, until the patient is deconditioned, emotionally distraught, and impaired in every aspect of life.

Pain treatment includes palliative and medically-corrective techniques. Pain management emphasizes altering the pain experience and enhancing the patient’s self-efficacy by teaching strategies to help the patient help himself. Primary interventions focus on exercise, strengthening, and stretching.

35. List at least five non-pharmacologic methods of pain management.

36. Of non-opioid, opioid, and adjuvant medications for pain, which have ceilings (the maximum dose above which there is either a risk of toxicity or no further effect)?
Osteoporosis

Osteoporosis is caused by a reduction in bone mineral density, increasing risk of spinal, hip, and other fragility fractures. Serious concerns from prolonged immobility, which often occurs with disability, are the loss of calcium and the increased risk of osteoporosis. These complications put patients at risk for fractures and kidney stones.

Patients requiring rehabilitation care may have premorbid osteoporosis. Risk for development or worsening osteoporosis occurs when disability results in immobility and reduced weight-bearing and strengthening activities.

Careful management of immobilized patients is required to prevent hypercalcemia, renal impairment, and the development of kidney stones. This includes:

- Cautious use of calcium supplements
- Early mobilization, which includes weight bearing and muscle tension on long bones (through range of motion, standing tables, electrical stimulation, etc.)

37. What type of osteoporosis develops in persons with disability or immobility?

Risk Factors for Osteoporosis

Recognition of risk and prevention is the best method of management. This requires a good foundation of bone during childhood and teen years.

38. List modifiable risk factors for the prevention of osteoporosis.
Care of the Patient With Osteoporosis

Fractures can be deadly for elderly patients. Complications are common. Risks further increase when the patient has other health problems. Be particularly alert for signs and symptoms of VTE and pneumonia.

39. List three ways you can decrease the risk of the development of these complications.

Exercise is critical to continued recovery from fractures and to slowing the progression of osteoporosis. Return of function is a serious concern for elderly patients following fractures. Consequently, efforts of the rehab team should be directed toward maximizing function and safety in an effort to return the patient to the home environment. Failure to access appropriate services at appropriate times can lead to continued institutionalization.

On the computer: Care of Patients: Other Diagnoses/Cardiopulmonary Disease, pages 28-36

Cardiopulmonary Disease

The ability to breathe and expend energy often is taken for granted. These abilities quickly are compromised by obstruction, impaired perfusion, and immobility.
Pulmonary Disease Risk Factors

Respiratory function may be affected generally by problems such as smoking, immobility, allergy, or infections. In other cases, there may be particular problems related to airway clearance, breathing patterns, gas exchange, or the ability to sustain spontaneous ventilation. Risk factors include excessive or thick secretions, immobility, ineffective cough, damaged lung tissue, decreased lung or chest wall compliance, inflammation, and vascular congestion.

40. Complete these phrases to identify the four respiratory problems that arise from pulmonary disease.

- Ineffective ________________ clearance
- Ineffective ________________
- Alterations in ________________ patterns
- Ineffective ________ exchange

Restrictive vs. Obstructive Disease

Pulmonary disease presents as obstructive, restrictive, or pulmonary vascular disease. Some patients have a combination of the above.

Identify which of the following symptoms are associated with restrictive and which are associated with obstructive diseases.

41. ____________ Loss of inspiratory reserve
42. ____________ Lung fibrosis
43. ____________ Increase in residual volume
44. ____________ Airways collapse (chronic obstructive lung disease/emphysema)
45. ____________ Pulmonary hypertension
46. _____________ Pulmonary edema
47. _____________ Chest wall rigidity
48. _____________ Bronchial obstruction (acute asthma, bronchiectasis, cystic fibrosis)
49. _____________ Neck obesity
50. _____________ Neurologic weakness (spinal cord injury and other neurological diseases)
51. _____________ Chest wall restriction from bracing

**Nursing Diagnosis: Ineffective Airway Clearance**

Interventions focus on assisting the patient with coughing and expectoration of sputum through:

- Controlled cough techniques (splinting and assisted cough)
- Staged cough techniques (sip, purse lips, exhale 2-3 times, then cough)
- Assisted cough techniques (quad cough)
- Daily bronchial hygiene

52. Can you think of any reasons that postural drainage and chest physiotherapy would be contraindicated?

**Nursing Diagnosis: Ineffective Breathing Pattern**

Dyspnea is the most common complaint in patients with ineffective breathing patterns. There are several options for management of this problem. It is helpful to work with the patient to determine what works for him and then to keep plans simple and focused on those intervention strategies. If interventions are successful, oxygen levels will be improved and respiratory rate will slow.
53. List four interventions that may be used for these patients.

What’s in It for Me?

Persons with cardiac disease generally are under the age of 60. Costs of cardiac care, including healthcare, medications, and lost productivity, are in the hundreds of billions of dollars. Supervised exercise programs, education, and lifestyle changes have dramatically improved outcomes for these patients. Ongoing research is identifying the optimum amounts and types of exercise that are safe for patients, as well as the type of patient most likely to comply with and benefit from different types of programs.

Acute Management

As soon as the cardiac patient stabilizes, the rehabilitation process begins. The goal is to provide close supervision as the patient participates in exercises and lifestyle changes. The patient undergoes testing and evaluation to determine the effectiveness of medications and exercise regimens.

Behavioral and lifestyle changes should be reinforced during this time in an effort to develop habits that will carry over on return to the community. Activity levels are advanced according to tolerance.

54. Identify the goal of acute care of the cardiac patient.

55. Describe intervention strategies used to achieve this goal.
Rehabilitation

Rehabilitation starts during inpatient care with close supervision and monitoring of responses to exercise, leading to a prescriptive exercise program to improve cardiac function, response to activity, and overall well-being.

56. What is included in education for patients in cardiac rehab programs?

Exercise Prescription

57. How are exercises prescribed for cardiac patients?

58. List criteria for terminating an exercise session.

59. What is a general guideline a patient can use for resumption of sexual activity?
60. Describe work-hardening techniques that may be utilized to facilitate a return to work.

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Cancer

The rehab team must work conscientiously and closely with the medical team, providing a detailed treatment plan that includes rationale and necessary evidence or support for selected care strategies.

Patient empowerment and education enable patients with cancer to recover, or to live the best quality of life possible, given the circumstances. Energy management and body image enhancement are key components of care with this population.

61. How does fatigue impact function?

62. List three interventions to address fatigue.
Types of Burns

Flames and scalds cause the majority of burn injuries. Rehabilitation of burn injury begins as soon as the patient is medically stable, focusing on maintaining and regaining function and promoting reintegration into the home and community.

The skin is the largest organ of the body. As such it has multiple functions.

63. Identify at least five functions of skin.

Percentage of Body Surface Involved

The percentage of body surface involved is determined using the Rule of Nines. (Note how percentages are modified for children under the age of 10 and for infants to accommodate for a larger head size.)
Depth of Burn Injury

The depth of the burn influences the recovery pattern and dictates treatment methodology.

64. What are two factors in determining the depth of tissue injury?

Acute Systemic Problems

The systemic response to serious burn injuries is far more critical than the injury itself. They can impact all systems in the body and can cause serious complications.

65. What type of nutrition problem is likely to occur with severe or extensive burns, and how long does it last?

Burn victims are considered the most extreme example of metabolic stress. The intensity of the stress response is proportional to the body surface area burned. Most patients require enteral supplemental feedings because of their increased need for nutrition. Suboptimal nutrition has a negative impact on multiple facets of recovery.

66. List four negative impacts on recovery from poor nutrition.
Rehabilitation of Burn Injuries

The ultimate goal of burn wound care is to achieve wound closure and avoid complications. Meticulous wound cleansing and debridement are necessary to prevent complications and facilitate wound healing.

Wound healing occurs in phases:

- Hemostasis
- Inflammation
- Proliferation
- Remodeling

67. Remodeling is the longest phase of wound healing. How long would you expect this phase to last?

Pressure dressings are used to reduce edema and scar tissue formation. As wounds heal and scar tissue forms, these may be replaced with pressure garments. These products should be worn 23 hours per day for maximum effect.

Positioning is used to:

- Protect wounds
- Lessen edema in the extremities
- Counteract wound and scar contraction
- Maintain tissue in elongated postures
A severe complication, possible with inappropriate positioning for long periods of time, is damage to the nerve or nerve plexus from overstretching or prolonged pressure. It also is possible for the patient to develop heterotopic ossification, particularly in the elbow joint.

Splints may be used to prevent or decrease scar contractures or to protect exposed joints or tendons. It is helpful if the splints are labeled to assist with application.

68. Patients with neck burns should be discouraged from using pillows until scar tissue is mature. Can you explain why?

Active exercise can start during the inflammatory phase of wound healing. Pain, edema, and loss of tissue elasticity make exercise and activity difficult for patients. In order to restore and maintain mobility, patients must participate in regular, daily therapeutic activity.

69. What activity elongates shortened soft tissue?

Psychosocial issues, including grief and adjusting to self-esteem and body image changes, may be difficult and take years.

Patients may have multiple skin care problems including itching, breakdown, rashes, sweating, etc., after a burn injury. Education is important for self-care and the prevention of problems. Most problems can be handled with ointments, creams, or oral medication during follow-up with the physician. Sun exposure should be avoided until scars reach full maturity.

70. Explain why sun exposure should be avoided.
71. The patient needs to be cautioned that scars and grafted tissue may be less sensitive to heat and pressure. Why does this occur?

While in the scar maturation phase of healing, burn scar supports should be worn at all times, and extremes of temperature should be avoided. This is a major consideration when determining the time to return to work. In addition, the PCE or FCE may be used to determine when a patient is able to return to a preinjury line of work.

72. What are the PCE and FCE?

On the computer: Complete the Care of Patients: Other Diagnoses quiz, page 44.

Then, go to the Main Menu to complete the posttest.

1. Social changes at the turn of the 20th century led to:
   - The concept of caring for those less fortunate than us
   - The development of special schools that provided vocational training for the crippled, blind, and deaf
   - The establishment of public health departments in major cities, causing improvements in hygiene and nutritional status, which was closely followed by the development of immunization programs

2. World War I impacted the development of rehabilitation services by bringing a focus to rehabilitation for surviving soldiers.
   - In 1917, the Surgeon General of the United States developed the Federal Division of Special Hospitals and Physical Reconstruction at Massachusetts General Hospital to treat wounded soldiers.
   - Frank Granger trained physical reconstruction aides that were sent to France to treat war casualties.
   - Initial efforts to provide vocational training for soldiers resulted in the passing of the Vocational Rehabilitation Act, the first rehabilitation act. The Veterans Administration was created.

3. Epidemics and the passage of the Social Security Act dramatically impacted rehab services by expanding rehabilitation care strategies and defining the rehabilitation process.
   - The polio epidemic led to the development of specialty hospitals and clinics.
   - Sister Elizabeth Kenny used muscle manipulation and eliminated the use of rigid orthoses to manage polio.
   - Passage of the Social Security Act of 1935 defined rehabilitation as a process that helped disabled persons become capable of engaging in financially-compensated occupations.

4. A new method of treating infection (sulfa) was developed. Methods of managing trauma and handling shock were becoming more sophisticated.

5. Post-WWII trends impacting rehabilitation were a decrease in mortality and an increase in the health status of society.
   - The introduction of the automobile and the impact of the industrial revolution created a potential for injury that had not previously existed.
   - Increasing leisure time encouraged participation in recreational activities and their associated risk of trauma.

6. Emergency healthcare improvements:
   - Triage principles were developed and helicopters were used to transport the injured.
   - The concept of treatment at the scene expanded and led to the development of paramedics and a significant decrease in mortality.
   - Technological advances and further development of chemotherapeutic agents also increased survival rates.

7. The scope of rehab was expanded to include chronic diseases and needs of the elderly.
   - Independent living movements, initiated in Berkeley, California, focused on self-determination, community awareness, and community access, resulting in legislation that demanded accessibility and access to care.
   - Medicare legislation stimulated the demand for rehabilitation nurses, especially by insurance companies.
   - In 1965, the Workmen’s Compensation and Rehabilitation Law passed due to rising concerns over the quality of work environments and care of injured workers.

8. The needs of the disabled became a social concern.
   - Reimbursement was very attractive in rehabilitation settings and was used as an alternative when the prospective payment system hit acute care.
   - Trauma centers were developed and technology continued to save more lives.
   - Traumatic injuries from autos and recreational activities climbed, leading to the development of protective legislation.

9. The Rehabilitation Act of 1973. Check the Reference section in the computer course for more information on this Act, including a brief summary of Sections 501-504 and 508.

10. The Americans with Disabilities Act of 1990. Check the Reference section in the computer course for more information on this Act, including a summary of Titles I-IV.

11. Title I prohibits discrimination in the workplace in employment practices and in physical accessibility.

12. Title II requires equal access to public transportation such as buses, railways, subways, and other forms of ground transportation.

13. Title III requires private businesses to be accessible, including hotels, healthcare centers and offices, shopping centers, restaurants, etc.
14. Requires equal access to telecommunications without additional billing for services.

15. Many issues impact the field:
   - Ethical issues: Do we save everyone? Who chooses? Should euthanasia be legal? Who has access to services? What about managed care? What about healthcare reform?
   - Passage of new laws increasing access and opportunities for the disabled
   - Increased efforts at prevention
   - Aging with a disability now an issue
   - Increased numbers of people with multiple disabilities
   - Increased access to technology to improve the quality of life for disabled individuals
   - Continued demand for rehab nurses to meet the needs of an aging population; increased number of people with disabilities; and increased life spans (which, in and of itself, increases the likelihood of disability)
   - Continued legislation will direct care delivery and access. Nurses can and should get involved in the legislative process to provide input for policy making and healthcare planning and to guide the development of the future of healthcare and the profession.

16. Individualized education plan (IEP)
   17. 1935
   18. 1997
   19. 1990
   20. 1973
   21. 1991
   22. 2014

~Chapter 3~ Philosophy & Values of Rehabilitation Nursing

1. Activity
2. Impairment
3. Participation
4. True
5. True
6. True
7. Caregiver
8. Counselor
9. Advocate
10. Educator
11. Collaborator
12. Coordinator

~Chapter 4~ Nursing Theories in Rehabilitation

1. Neuman
2. Roy
3. King
4. Orem
5. Rogers
6. Hall
7. The core (person), the care (body), and the cure (disease) are interlocking realms in this model. Rehab is a process of learning to live within limitations; nursing focuses on nurturing and teaching.
8. Energy fields are key components of this theory. People are viewed within the context of the environment and patterns. Change is unidirectional, with rehabilitation focused on developing a person into a more complex individual via the experience of disability and care. Nursing is knowing, rather than doing. Nurses knowingly assist the process of change.
9. King's theory reflects an open system in which health is maintained via adjustment to stressors. Goal attainment is a key concept. The nursing process functions within the social system, sharing perceptions with the patient to identify goals and work together toward achieving them.
10. Neuman's theory is one of open systems. The person is a unique and holistic system, interacting with the environment. Nursing is focused on interventions that minimize stress. Interventions are aimed at primary, secondary, and tertiary prevention; nursing goals focus on strengthening lines of resistance. Nursing assessment is holistic.
11. In Orem's theory, the person is viewed as one who takes deliberate action to meet needs. When the person is unable to do that (self-care demands exceed self-care agency), a need for nursing is created. Self-care deficits are universal, developmental, or health-deviation problems. As the patient recovers, nursing care is delivered in a wholly compensatory, partly compensatory, or support/educative manner.
12. In Roy's theory, a focus on adaptation supports the patient in responding to changing needs in a changing environment. With an emphasis on mutual respect, the nurse addresses basic physiological needs, self-concept, role mastery, and interdependence.
13. Health perception-health management, self-perception, role-relationship, coping-stress tolerance, and value-belief patterns
14. Hardiness
15. Locus of control
16. Self-efficacy
17. Health belief model
~Chapter 5~ The Economics of Rehabilitation

1. Medicare
2. Medicaid
3. Workers Compensation
4. Private Insurance
5. Interventions include:
   - Coordinate care and referrals to maximize resources.
   - Provide education and realistic options.
   - Empower the patient/caregiver to be creative in the pursuit of options.

~Chapter 6~ Rehabilitation Teams & Teamwork

1. Social worker
2. Therapeutic recreational specialist
3. Psychologist
4. Physical therapist
5. Physician/physiatrist
6. Occupational therapist
7. Rehabilitation nurse
8. Neuropsychologist
9. Patient
10. Speech-language pathologist
11. Multidisciplinary
12. Interdisciplinary
13. Transdisciplinary
14. **Multidisciplinary strengths:** Roles are clear. Limited coordination is required.
    **Multidisciplinary weaknesses:** This approach encourages fragmentation and duplication of effort. Patient/family participation is limited. It involves little collaborative work or goal planning. It may be less effective/efficient; length of stay and cost may be higher.
15. **Interdisciplinary strengths:** This approach has the potential to reduce costs, decrease length of stay, and improve outcomes. All team members have holistic view of patient. Care can be comprehensive, consistent, and non-fragmented. It supports the development of care paths.
    **Interdisciplinary weaknesses:** System is complex; involves a significant amount of collaboration, coordination, and communication; and is time-consuming. Roles are variable. Leadership issues/problems are more common.
16. **Transdisciplinary strengths:** Fewer persons interacting with patient decreases stimulation and stress. It is a very holistic approach that may conserve staff and resources.
    **Transdisciplinary weaknesses:** This approach is very complicated. Lack of expertise may limit quality of care. Significant collaboration and communication are required.
17. Strategies to decrease relocation stress include:
   - Reducing environmental differences between old and new settings; promoting continuity of care in new environment
   - Transferring all personal items (e.g., mobility aids, eyeglasses, hearing aids, dentures, prostheses, and belongings) with the person
   - Transferring during daytime hours
   - Offering the person decision-making opportunities throughout the relocation experience
   - Offering help in maintaining contact with significant others by making telephone calls, writing letters, and visiting with previous roommates when applicable
18. According to CARF, the person coordinating the patient’s care:
   - Is responsible to ensure achievement of outcomes
   - Has authority to ensure the provision of care
   - Is knowledgeable about the program being provided to the patient
   - Is available to interact with the patient, team, and other stakeholders
   - Facilitates the patient’s orientation to the program and predicted outcomes
   - Ensures communication with internal and external sources
   - Uses financial information in decision making about the provision of services for the patient
   - Facilitates the involvement of the patient throughout the rehab process
   - Obtains appropriate information to facilitate follow-up activities of the organization in its evaluation of program performance
   - Ensures discharge/transition arrangements are completed
   - Facilitates implementation of discharge/transition recommendations
19. The purpose of case management is to:
   - Facilitate the patient’s functioning in the least restrictive environment.
   - Facilitate health and return to work or school.
   - Ensure timely and effective care.
   - Ensure appropriate management of resources.
20. As early in the patient’s care process as possible
21. Improve efficiency in working with case managers by:
   - Establishing a consistent communication system and keeping them informed
   - Providing access to your documentation
   - Ensuring they understand your recommendations and the reasoning behind them
   - Collaborating regarding discharge planning
   - Assisting in identifying times to meet with families and team members
22. Well-defined goals are:
   - Clear, specific, and meaningful
   - Realistic and attainable
23. It prevents stagnation and can increase creativity.

24. Strategies for resolving conflict include:
   - Create an effective atmosphere for discussion and compromise by preparing yourself for a positive outcome.
   - Clarify perceptions of all involved parties.
   - Focus on shared needs and a positive outcome.
   - Focus on the current issue; do not dwell on past behaviors or issues.
   - Generate a list of options—ask for the other person’s list first.
   - Develop a list of steps to resolve the conflict.
   - Make a mutual-benefit agreement that will provide a long-term solution.

~Chapter 7~ Meeting Standards: Quality Improvement & Program Evaluation

1. Accessibility and safety of those with disability
2. True
3. True
4. False. Internet access has improved ease of access, but data collection and reporting have provided the data to access.
5. False. Benchmarking is used to compare data against the best, oneself, or another standard.
6. False. ASPIRE is a CARF guideline for quality improvement.
7. Plan, Do, Check, Act, as a process of quality improvement
8. Doing the right thing, right the first time, on time, all the time, and continuously looking for ways to improve
9. Lean approach
10. Cause-and-effect diagram or fishbone tool
11. Pareto chart
12. Flowchart
13. Efficiency and effectiveness of care
14. Yes
15. FIM®
16. WeeFIM®
17. OARS (Older Americans Resources and Services)
18. OASIS
19. Yes
20. EBP is a problem-solving approach to integrate critical appraisal of the evidence concerning a clinical problem with clinical experience and patient needs, values, and preferences.

~Chapter 8~ Populations With Special Needs: Growth & Development

1. definable, sequential
2. complex
3. General
4. Cephalocaudal
5. Proximodistal
6. Developmental task
7. Deviant development
8. Delayed development
9. 3 years
10. 1 year
11. 4 years
12. 3-5 years
13. 12 years and up
14. 5-12 years
15. Age 12 and up
16. 2-5 years
17. 5-12 years
18. Birth to 18 months
19. Adolescence
   - Encourage decision making
   - Provide information and rationales
   - Respect privacy
   - Support social relationships
20. Middle childhood
   - Maintain contact with peers
   - Provide honest, complete explanations
   - Encourage responsibility and skill mastery
21. Early childhood
   - Focus on abilities
22. Toddlerhood
   - Honestly explain reasons and procedures
   - Maintain routines and ritualistic behaviors
   - Keep safe
   - Adapt toys/environment to encourage play
23. Infancy
   - Support parental bonding
   - Limited use of restraints
   - Place age-appropriate toys in visual field
24. Rehabilitation is used to assist a person to relearn lost skills. Habilitation is used to assist a person to learn new skills that have not yet been mastered.
25. Acquired disabilities result from trauma, infection, or other conditions occurring after birth. Congenital disability is the result of a genetic disorder or is present from time of birth and not related to external factors present at birth.
26. Monitor patterns of growth; carefully evaluate physiologic functioning; maintain well-child care; prevent complications; facilitate respite care.
27. Establish a communication system; facilitate mobility and positioning to prevent problems and maximize function and interaction; teach self-care skills; adapt play activities; and facilitate and adapt educational techniques.
28. Assist in building self-esteem; assist to develop appropriate social skills; facilitate parenting skill development; and address issues of the future and independent living.

29. This is a series of amendments to the 1970 act that defined handicapped children and made funds available for them. The 1975 amendment requires provisions of educational and support services for all children older than age 3 years, including individual education plans (IEPs). An amendment in 1984 expanded services.

30. This is a federal mandate providing services for children with disabilities 0-5 years of age. It mandates education and services for children 3-5 years old with a developmental disability in the least restrictive environment. It creates or expands early intervention services for children from birth to 3 years of age under Part H of the statute.

31. Individual Education Plan
32. Individual Health Plan
33. Individual Transition Plan

~Chapter 9~ Populations With Special Needs: Effects of Aging

1. Cardiovascular:
   - Decreased arterial blood flow, which increases risk of stroke
   - Decreased work capacity
   - Decreased sensitivity of baroreceptors, which increases risk of orthostatic hypotension
   - Decreased heart rate and stroke volume, which increases risk of developing congestive heart failure (CHF), hypertension, arterial occlusion, and myocardial infarction (MI)

2. Hematological:
   - Anemia
   - Hypoalbuminemia
   - Decrease in body water
   - Increase in fat that potentially alters effects of medications

3. Renal:
   - Decrease in glomerular filtration rate, leading to decreased creatinine clearance
   - Increased risk of dehydration
   - Altered clearance of medications

4. Respiratory:
   - Decreased pulmonary reserves and vital capacity
   - Decreased respiratory fluids, leading to increased risk of respiratory infections and pulmonary plugs

5. Sensory:
   - Decreased night vision and depth perception
   - Decreased auditory acuity; decreased sense of smell and taste
   - Decreased perception of deep pain, touch, and vibratory sensations

6. Gastrointestinal:
   - Decreased caloric needs
   - Decreased absorption of nutrients
   - Decreased GI motility

7. Endocrine:
   - Decreased glucose tolerance
   - Potential hyperthyroidism

8. Neurological:
   - Decreased short-term memory
   - Alterations in balance and coordination

9. Musculoskeletal:
   - Decreased activity, contributing to loss of bone mass and nitrogen

10. Skin:
    - Decreased subcutaneous fat
    - Dermal thinning
    - Decreased collagen
    - Decreased elastin, causing poor wound healing

~Chapter 10~ Psychosocial Issues in Rehabilitation

1. This answer will reflect your own self-assessment.

2. Family and friends can be supportive or unrealistic. If they keep pushing unrealistic expectations, the patient may lose respect for them and the relationship can suffer, leaving the patient with less support and socialization. Other responses can be avoidance or encouragement of maladaptive behaviors. The history of the relationship before the disability will likely predict the relationship following a disability.

3. The responses of children vary according to the type of injury and the developmental level of functioning. Common themes include feeling different from peers, mourning the loss of activities such as sports, and wondering what was done to deserve this punishment.

4. Resilience is the ability to recover quickly from difficulties: to successfully adapt to life’s challenges, be knocked down and come back stronger than ever. Resilient persons do not let failure overcome them, having positive attitudes, optimism, the ability to regulate emotions, and the ability to view failure as a form of helpful feedback.

5. Questions may include:
   - Are there any spiritual or religious practices important to you while you are here?
   - Do you need access to any religious books or articles?
6. You can:
   - Educate yourself about the faiths in your community.
   - Understand your own spirituality.
   - Know who and where your resources are.

7. Interventions include:
   - Pray with the patient/family.
   - Develop rapport and provide support.
   - Refer to appropriate minister or spiritual advisor.
   - Provide opportunities to practice faith and/or spirituality.

8. This answer will depend on the topics you chose to research.

9. Assess appearance, behavior, affect, mood and response to the current situation, thought processes, insight, judgment, perception and understanding of the current situation.

10. Assess community by determining availability of healthcare services, vended supplies and equipment, and resources such as support groups, transportation, meals, recreation activities, etc. and determine if there are social or physical barriers affecting success in the community.

11. Change
12. Unfreezing
13. Refreezing
14. Movement
15. Restraining forces
16. Driving forces
17. All of these are correct.

18. Increased heart rate, insomnia, elevated blood pressure, fatigue and weakness, increased respiratory rate, flushing or pallor, diaphoresis, dry mouth, dilated pupils, body aches and pains (especially chest, back, and neck), voice tremors or pitch changes, trembling, restlessness, palpitations, faintness, dizziness, nausea, vomiting, paresthesias, frequent urination, hot and cold flashes, and diarrhea are a few examples.

19. Admits to feelings of apprehension, lack of self-confidence, helplessness, losing control, or nervousness; exhibits irritability, impatience, criticism of self and others, angry outbursts, withdrawal, crying, tension, or being "keyed up"; shows inability to relax, anticipation of misfortune, lack of initiative, tendency to blame others, self-deprecation, and more

20. This person is likely unable to read social cues or respond appropriately; has decreased motivation and lack of urgency

21. Interventions may include:
   - Assessing level of anxiety
   - Removing excess stimulation
   - If appropriate, providing activities that can reduce tension (e.g., physical activity, games)
   - Referring for further evaluation, support, or counseling, as necessary

22. Flashbacks, nightmares and other sleep problems, severe anxiety, uncontrollable thoughts about the traumatic situation, problems regulating emotions and impulse control, dissociative reactions, and impaired attention are common symptoms of PTSD.

23. Provide assurance, encourage expressions of feelings, reflect on reality, discuss what can be changed and what cannot, teach relaxation techniques

24. This answer should reflect your personal choices.

25. Provide gentle support. "We sure hope you are right. And if you are, then you really need to exercise, keep your muscles moving, and stay active so you can take advantage of your return when it arrives."

26. Overt or covert expressions of dissatisfaction about the inability to control the situation (e.g., work, illness, prognosis, care, recovery rate) that is negatively impacting outlook, goals, and lifestyle

27. To reinforce the patient's role as a decision maker and give some control back to him

28. Interventions may include:
   - Encouraging to express feelings, especially about the way he or she feels, thinks, or views self
   - Encouraging to ask questions
   - Providing reliable information and reinforcing information already given
   - Encouraging visits and contacts with peers and significant others
   - Providing opportunity to share with people going through similar experiences
   - Discussing the difficulty that others (spouse, friends, co-workers) may have with visible change
   - Allowing significant others opportunities to share feelings and fears
   - Referring to community resources if needed

29. Interventions include:
   - Establishing a trusting relationship
   - Promoting social interactions
   - Exploring strengths and resources with person
   - Discussing expectations
   - Referring to community resources as indicated (e.g., counseling, assertiveness courses)

30. Interventions include:
   - Approaching aggressive patients with a kind, firm demeanor
   - Teaching to express hostility in a socially-acceptable manner and to channel hostility into productive, useful activities
   - Teaching sense of personal responsibility for his or her actions
   - Applying behavior modification techniques

31. Motor
32. Access
33. Relationship
34. Funding
35. Education
36. Self-Esteem
37. Interventions include:
   - Reducing or eliminating causative and contributing factors
   - Decreasing barriers to social contact
38. Interventions may include:

- Teaching social skills
- Initiating referrals as indicated
- Using open-ended questions and encouraging patient to talk about experiences with healthcare (e.g., hospitalizations, family deaths, diagnostic tests, blood tests, x-rays)
- Asking directly, "What are your concerns?"
- Exploring patient’s understanding of the problem and expectations of treatment and outcomes; determining if beliefs are realistic and correct
- Assessing problematic factors of prescribed therapy (e.g., time, cost, complexity, convenience, adverse effects)
- Discussing the risks and benefits of adhering to the prescribed regimen
- Affirming right to refuse all or part of the prescribed regimen

39. You should teach:

- Warning signs of burnout
- To take care of self, too
- To get enough sleep, use naps if necessary
- Advantages of eating a nutritionally-sound diet and getting some exercise
- To delegate tasks as necessary
- To set priorities and do only what is necessary
- How to arrange for respite care
- How to use support systems
- Importance of maintaining a sense of humor

~Chapter 11~ Patient & Family Education

1. Create a need to know in the learner.
2. Adults are self-directed learners with experience. Readiness to learn is integrated with roles and expectations. Learning focuses on problem solving. Adults have a wide variety of experiences that influence learning processes. Learners evaluate learning against perceptions of achievement of own goals. Learning activities should be interactive, and the environment should offer mutual respect, trust, collaboration, support, and mutual planning.
3. Affective components address attitudes and desire to comply with medication regimens. Cognitive components include understanding reason for medications, management strategies, and potential risks. Psychomotor components include actually setting up and administering medications.

~Chapter 12~ Community Reentry

1. Entryways/exits, kitchen, bathroom, bedroom, water, heat, and energy supplies
2. Grocery shopping, yard work, paying bills, housekeeping, pet care, car care, laundry, etc.
3. Grab bars in bathroom, tub bench, doorknob turners, rolling cart in kitchen, reacher, adapted phone, computer, etc.
4. Limit access to alcohol, guns, car, and poisons; prevent elopement.
5. CPR, Heimlich maneuver (especially if the person with the disability is dysphagic), notification of emergency services regarding special needs
6. Previous interests.
7. (Answer should reflect your community.)

~Chapter 13~ Anatomy & Physiology Review

1. Left
2. Left
3. Right
4. Left
5. Right
6. Right
7. The correct labels are:
8. Frontal
9. Parietal
10. Parietal
11. Parietal
12. Frontal
13. Parietal
14. Frontal
15. Frontal
16. Frontal
17. Parietal
18. Frontal
19. Cerebellum
20. Cerebellum
21. Frontal
22. Frontal
23. Frontal
24. Frontal
25. Frontal
26. Cerebellum
27. Occipital
28. Frontal
29. Occipital
30. Temporal
31. Temporal
32. Cerebellum
33. Temporal
34. Medulla
35. Internal Capsule
36. Limbic System
37. Hypothalamus
38. Medulla
39. Hypothalamus
40. Medulla-
41. Limbic System
42. Medulla
43. Thalamus
44. Basal Ganglia
45. Hypothalamus
46. Medulla
47. Limbic System
48. Medulla
49. Thalamus
50. Limbic System
51. Thalamus
52. Reticular Activating System
53. Pons
54. Pons
55. Limbic System
56. Basal Ganglia
57. Optic, CNII
58. Olfactory, CNI
59. Trigeminal, CNV
60. Vagus, CNX
61. Accessory, CNXI
62. Glossopharyngeal, CNIX
63. Carbon dioxide
64. See picture
65. To provide collateral circulation
66. There are 8 cervical nerves and 7 cervical vertebrae.
67. C8
68. S2-5
69. C3-5
70. T1
71. Central nervous system, above the level of the reflex arc
72. Peripheral nervous system, below the level of the reflex arc
73. Sensory receptor to spinal cord to motor nerve
74. 2
75. 1
76. 3
77. 5
78. 4
79. 4+
80. 1+
81. 3+
82. 2+
83. 0+
84. S5
85. Parasympathetic
86. Sympathetic
87. Sympathetic
88. Sympathetic
89. Parasympathetic
90. Parasympathetic
91. Sympathetic
92. Sympathetic
93. Parasympathetic
94. Parasympathetic
95. Parasympathetic
96. Parasympathetic
97. Sympathetic
98. Sympathetic
99. Sympathetic
100. Parasympathetic
101. Parasympathetic
102. Sympathetic
103. Parasympathetic
104. Sympathetic
105. Cardiac cycle, heart rate, diastolic intraventricular pressure
106. Blood volume and arterial compliance
107. Cardiac output
108. Stroke volume
109. Shallow
110. Increasing
111. 60
112. Depresses
113. Closure, bolus
114. Tongue, pharynx
115. Airway
116. Occurs after meals; results in large peristaltic waves moving chyme through the colon
117. Occurs when stool enters the rectum; results in peristaltic waves of the lower colon
118. Diet, hydration, exercise, medications, sensorimotor function, cognition, systemic and local factors, metabolic factors, health state, psychosocial and learning factors
119. Relaxation
120. Contraction
121. Relaxation
122. Decreases
123. Increases
124. Decreases
125. Increase
126. Decrease
127. Increase
128. Increase
129. Diarrhea, diuretics, diabetes insipidus, dysphagia, wound exudates, or excessive diaphoresis
130. Poor skin turgor, thickened secretions, thirst, fatigue, dry skin, weight loss, constipation, or concentrated urine; if it includes advances to ICF loss, symptoms will include weakness, restlessness, confusion, tetany, hyperpnea, and fever
131. Systemic: SIADH, abnormal renal function, congestive heart failure (CHF), pulmonary edema, excess Na or fluid intake, hyperaldosteronism
   Localized: edema, impaired lymph drainage
132. Monitor weight, ROM, elevation of affected extremity
133. Detrusor-external sphincter dyssynergia
134. Epidermis
135. Dermis
136. Subcutaneous
137. True
138. True
139. True
140. Sleep apnea; pain; diuretics or edema, causing increased nighttime voiding; morbid obesity that impedes the airway when sleeping; and medications that depress delta waves while sleeping, such as barbiturates
Certification Review for Rehabilitation Nursing: Answer Key

~Chapter 14~ Care of Patients: Stroke

1. Ischemic
2. Hypertension, nutrition, obesity, smoking, high cholesterol, sleep apnea, heavy alcohol use, diabetes, and substance abuse are common risk factors that can be modified by lifestyle choices.
3. Sudden severe headache, sudden weakness or inability to move an extremity or side of face, numbness or sensory loss, difficulty swallowing or speaking, vision problems, unexplained dizziness, unsteady gait or sudden falls, altered cognition
4. Middle cerebral artery
5. Left
6. Right
7. Left
8. Right
9. Right
10. Left
11. Right
12. Left
13. Right
14. Left
15. Right
16. Right
17. Right
18. Left
19. Right
20. Right
21. Right
22. Right
23. Left
24. Because the thrombolytic, rt-PA, should be given as soon as possible and within a 3-4.5 hour window.
25. Dehydration, aspiration pneumonia, venous thrombosis, pulmonary embolism
26. True
27. False
28. True
29. Appropriate positioning supports joints, prevents the development of contractures, and promotes functional recovery.
30. Limits in recovery of movement and severe and long-lasting pain
31. Long, slow stretching is of more benefit than quick stretches of multiple repetitions.
32. Increased participation in rolling, bridging, and positioning
33. It prevents the ankle from turning in, lifts the toes off the floor when bringing the foot forward, and improves heel strike, increasing gait stability.
34. Height, width, arm height, leg rest length, seat length
35. Curbs, doors, and stairs/ramps, and traffic
36. Teach strategies that incorporate both sides of the body for feeding, grooming, hygiene, and dressing; allow adequate time to practice and learn techniques. Attend to safety and organize the environment to compensate for perceptual deficits. Evaluate need for adaptive equipment such as plate guard, nonskid mats, rocker knife, long-handled sponge, soap-holder wash cloth, flip-top lids on bottles, grab bars, safety strips in bathtub, tub or shower seat, denture holder, Velcro® closures on clothing, elastic shoe strings, long-handed shoe horn, etc. Organize environment for effective participation in household maintenance chores (bed making, bill paying, laundry, etc.). Consider eligibility for constraint-induced movement therapy. (The Rehab Nursing Series™ provides additional training on activities of daily living in the course 1, 2, Buckle My Shoe... Functional Skill Development. You can find information at www.rehabclassworks.com/Function.htm.)
37. Agnosia: inability to recognize objects, persons, sounds, shapes, or smells due to failure to recognize the sensory input in spite of not having a deficit in that sense
38. Somatognosia: altered perception leading to inability to identify body parts
39. Anosognosia: severe denial of disability and impairments
40. Homonymous hemianopsia: visual impairment of the nasal half of one visual field and temporal half of the other, resulting in a loss of half of the overall field due to damage to the optic nerve behind the optic chiasm
41. Figure-ground deficit: difficulty distinguishing the foreground from the background
42. Form-constancy deficit: inability to distinguish between items of similar shape and form
43. Unilateral neglect: decreased awareness of one side of the body, most often affecting the left side of the body; often associated with denial
44. Geographic/topographic memory deficit: difficulty remembering and using topographical and geographical orientation to find one’s way around the environment
45. Apraxia: inability to perform skilled motor activities when there is sufficient muscle strength, coordination, and sensation
46. Ideational apraxia: failure to understand concepts related to the skill; inability to associate words and images with the performance of a motor task
47. Ideomotor or motor apraxia: motor planning issue in which the patient understands the concept, but is unable to do it on command; may be able to perform the task spontaneously
48. Delayed or absent swallow, coughing, history of aspiration pneumonia, weight loss, fear of eating or drinking, wet-sounding voice after drinking water, frequently clearing throat, complaints of something sticking or burning the back of the throat
49. Burping, indigestion, substernal pain from esophageal reflux, complaints of bad taste in mouth or bad breath, coughing or wheezing, high incidence of dental cavities
50. Incentive spirometry, deep breathing and coughing, and postural drainage
51. Position upright, preferably in a chair, leaning slightly forward. (Sit down, if assisting, to avoid encouraging patient to tip head.) Try to organize
meds so they can be given while patient is upright. Patient should rest before meals and stay up for a half an hour after meals (especially if he has esophageal problems) to discourage risk of aspirating foods stuck in the valleculae.

52. Avoid distracting environmental stimuli, including excess conversation. Provide the patient the opportunity to eat several small meals, rather than three large ones, to avoid fatigue.

53. Food should be warm/cold to increase sensory stimulation. It should form a cohesive bolus and not readily dispense in the mouth. If the problem is in the pharyngeal phase, and/or if swallow is delayed, thicken liquids. Sticky foods may be preferred if food hang in the pharynx or valleculae.

54. Avoid the use of straws for patients with pharyngeal phase problems or delayed swallows. Feed 1/2 teaspoon at a time (placed on back of the tongue toward unaffected side). Make sure the mouth is empty and the swallow complete before offering next bite.

55. Use a mirror to assist patients in self-monitoring for drooling (oral phase problem). Cut-away cups can help avoid head tipping when drinking. Oral motor exercises can strengthen the tongue and mouth. Brisk downward strokes on the chin can stimulate lip closure. Gentle pressure on cheek can help patient to sense and clear food that is pocketed. Make sure lips are closed, because swallow reflex cannot initiate if lips are not closed. Patients with right hemisphere lesions may require consistent verbal cues while eating. Modified supraglottic swallowing can assist patients with pharyngeal problems to complete the swallow and avoid aspiration. Icing techniques may be recommended for those with an absent swallow reflex. If the patient has problems with pharyngeal residue, you may be instructed to have the patient turn his head all the way to the affected side while swallowing, or to swallow twice and then rinse with thickened liquids with each bite. Sucking liquids through a straw may be helpful for patients who need to liquify liquids with each bite. Sucking liquids through a straw may be helpful for patients who need to liquify liquids with each bite.

56. Oral motor exercises can strengthen the tongue and mouth. Brisk downward strokes on the chin can stimulate lip closure. Gentle pressure on cheek can help patient to sense and clear food that is pocketed. Make sure lips are closed, because swallow reflex cannot initiate if lips are not closed. Patients with right hemisphere lesions may require consistent verbal cues while eating. Modified supraglottic swallowing can assist patients with pharyngeal problems to complete the swallow and avoid aspiration. Icing techniques may be recommended for those with an absent swallow reflex. If the patient has problems with pharyngeal residue, you may be instructed to have the patient turn his head all the way to the affected side while swallowing, or to swallow twice and then rinse with thickened liquids with each bite. Sucking liquids through a straw may be helpful for patients who need to liquify liquids with each bite. Sucking liquids through a straw may be helpful for patients who need to liquify liquids with each bite.

57. Evaluate protein and oxygen-carrying capacity of the blood (anemia), serum albumin, serum transferrin, BUN, RBCs, Hgb, ferritin, transthyretin (prealbumin), retinal-binding protein, insulin-like growth factor (IGF-1), fibronectin, serum B₁₂, and others.

58. Coordinate care; identify realistic goals; monitor weight and lab results; provide appropriate supplements; assist to eat if fatigue or cognitive problems limit self-feeding skills; provide support and social interaction during meals; and evaluate meals for appeal, correcting as necessary.

59. Provide foods which are high in fluid content and offer thickened liquids frequently. Consider implementation of the Frazier Water Protocol. Monitor intake/output, weight, and lab values. If necessary, supplement with enteral or IV fluids.

60. Internal and external sphincters, saddle sensation, sacral reflexes, and bulbocavernous reflex intact. Emptying is involuntary and sudden due to the patient’s failure to recognize and respond to the sensation of the need to defecate in a timely or socially-appropriate manner. Stool may be hard and smearing is common.

61. Use fluids, bulk, and fiber strategically to change the consistency of the stool. Increase fluid and activity levels. Use an upright position for defecation. Use stool softeners as necessary. If this is ineffective, use suppositories, stimulants, irritant cathartics, or low-volume enemas.

62. Use bathroom schedules based on the patient’s usual time of defecation. Watch for behavioral indications of the need to use the bathroom and assist the patient to get there in a timely manner. Make sure it is easy for the patient to get to the bathroom in a timely manner by responding to requests to toilet immediately.

63. Effects of aging (decreased strength of bladder contraction and pelvic floor muscles), medications (diuretics, cholinergics, anticholinergics, antihypertensives), constipation, pelvic prolapse, stress incontinence, enlarged prostate, effects of long-standing diabetes or other chronic disease

64. Sphincter control, saddle sensation, sacral reflexes, and bulbocavernous are intact. Bladder capacity may be reduced. Post-void residuals normal. Emptying is involuntary and sudden due to failure to recognize and respond to the sensation of the need to void in a timely or socially-appropriate manner. Urgency is common and nocturia may be a problem.

65. Correct complicating factors such as constipation and UTIs. If possible, manage side effects of medications. Administer anti-diuretics early in the morning. Hydrate adequately during the day so that fluid intake may be reduced after supper. Avoid foods with a diuretic effect (caffeine, grapefruit juice, etc.). Maintain skin integrity and avoid use of incontinence products that are expensive and increase the risk of skin breakdown.

66. Set voiding times according to a clock schedule.

67. Determine the patient’s previous pattern of voiding and assist to void just before routine times.

68. Encourages patients to take more responsibility for voiding and to assist with clean-up, should there be an accident. As a method of cuing, ask the patient if it is time to use the bathroom. Respond promptly when the patient indicates the need to void, sirdle.

69. Focus is on consciously delaying the urge to void through the use of distraction and schedules.

70. Allow enough time to communicate; encourage automatic speech responses; encourage imitation and singing (melodic intonation). Use self-talk (describing what is going on), parallel talk (another describing what is going on), cuing
with the first word or letter, and expansion (adding detail to partial statements: “Karen? Where is Karen?”). Anticipate needs and allow mistakes. Use communication boards and encourage gestures. (The Rehab Nursing Series provides additional training on care of patients with communication disorders in the course He Said, She Said... Disorders of Communication, Speech, & Language. You can find information at www.rehabclassworks.com/communication.html)

71. Remove excess stimulation; speak naturally (understanding is improved by context) and concisely. Use gestures, tactile cues, and facial expression.

72. Consider the patient’s ability to call for assistance, safely maneuver in the bathroom, exit the house in the event of a fire or other emergency, and the need to protect from hazards such as power tools, weapons, medications, or alcohol.

73. Early administration of antidepressant medications

74. Coumadin, antihypertensives, diuretics, antidepressants

~Chapter 15~ Care of Patients: Traumatic Brain Injury

1. Non-penetrating injury
2. Penetrating injury resulting in brain tissue exposure and disruption of normal protective barriers
3. Damage that occurs throughout the brain
4. A coma is a state of unconsciousness in which there is no arousal or awareness and no response to stimulation. Score is equal to or less than 8 on the Glasgow Coma Scale.
5. The patient may open eyes, but level of consciousness cannot be determined. Sleep/wake cycles may be present. Stimulation may demonstrate reflexive, but not localized responses.
6. This is an altered level of consciousness in which there is definite, reproducible, evidence of awareness of self and/or the environment that includes at least one of the following behaviors: command following, intelligible verbalization, recognizable yes/no responses, or movements or emotional responses to environmental stimuli.
7. When there is consistency in communicating, following commands and/or using objects
8. Loss of memory of day-to-day events following the trauma
9. See grid below.

<table>
<thead>
<tr>
<th>GCS</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-15</td>
<td>9-12</td>
<td>&lt;8</td>
<td></td>
</tr>
<tr>
<td>Loss of Consciousness</td>
<td>&lt;30 min</td>
<td>.5 - 24 hours</td>
<td>&gt;24 hours</td>
</tr>
<tr>
<td>Length of PTA</td>
<td>&lt;24 hours</td>
<td>1-7 days</td>
<td>&gt;7 days</td>
</tr>
</tbody>
</table>

10. Common complications include: hydrocephalus, aspiration pneumonia, heterotopic ossification, seizures, hypothalamic dysfunction, or endocrine disorders.
11. To monitor for signs and symptoms of SIADH or diabetes insipidus
12. See grid below.

<table>
<thead>
<tr>
<th>Urine Osmolality</th>
<th>Low</th>
<th>High</th>
<th>Low or normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Venous Pressure</td>
<td>Normal or low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DI</th>
<th>SIA DH</th>
<th>CSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine output</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Serum Na</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Urine Na</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Serum Osmolality</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

13. III
14. VI
15. VIII-IX-X
16. II
17. I
18. IV
19. VII
20. V
21. Sensory stimulation to achieve a response
22. Safety and trust
23. Increasing attention span, orientation and participation in routine, structured activities
24. Maximizing memory and executive functioning
25. Selection or focused attention, vigilance, and processing speed
26. Impairment of strategic control of attention otherwise known as vigilance
27. Little
28. Behavior
29. After
30. Procedural
31. Unlikely
32. Errorless
33. Sometimes
34. Consistency; limiting training to one or two items at a time; establishing methods that compensate for limitations in executive functioning and remembering to look at them
35. Cognitive flexibility, self-monitoring, ability to adjust actions and simultaneously consider multiple alternatives and their potential outcomes, planning, judgment, motivation, and organizational skills
36. Structured environment, training specific behaviors, use of cognitive remediation, and use of behavior modification
37. False. Motor disorders following TBI are dependent on the areas of the brain damaged and often present mixed pictures due to diffuse axonal injury.
38. Excessive eating and eating of inedible or poisonous products.
39. Monitor behavior for indications that he is about to void and rapidly redirect him to the
appropriate location. Attempt habit training by taking him to the bathroom just prior to the times he regularly tends to void so that he might use the toilet before he is urgent and thus maintain continence.

40. Keep environment clear, decide whether side rails are better up or down, consider a bed alarm or sitter, keep call light in reach, anticipate needs, and keep assistive aids in reach.

41. You may suggest an emphasis on retraining social skills with behavior modification techniques, such as providing appropriate cuing throughout the interaction, rehearsing appropriate responses, removing from the conversation when comments are inappropriate, requesting that others provide immediate, direct feedback when he is out of line, and praising for appropriate behavior.

42. Assist her to focus on the positive and to accept him as he is while trying to facilitate continued gains. Encourage to seek out resources and support systems and to openly discuss feelings. Make sure she has time for herself and that strategies for living in the community are rehearsed prior to discharge.

~Chapter 16~ Care of Patients: Spinal Cord Injury

1. Falls from a standing position; low impact falls
2. The zone of partial preservation is the area below the level of the injury (2-3 segments) that retains partial function. The lowest segment with some sensory and/or motor function defines the zone. It is documented as four distinct levels of function: right sensory, left sensory, right motor, and left motor. Note that this term is only applicable to complete injuries.
3. T1
4. The correct answer is b. Sacral sensation must be intact in order for an injury to be identified as incomplete.
5. Lower
6. A forward fall that results in the chin being thrust upward
7. Motor and sensory loss in the upper extremities and normal function in the lower extremities
8. Loss of voluntary motor control on the same side as the cord injury and loss of pain and temperature sensation on the opposite side
9. Absence of reflexes below the level of the injury
10. 1-12 months, although the amount of time is variable
11. There is a return of reflexes below the level of the injury.
12. VTE, pneumonia, and ileus
13. C3-5
14. Ventilator-dependent with absent cough
15. Absent cough with ventilatory capacity 10-40% of normal; accessory muscles and diaphragm support breathing
16. Absent cough with ventilatory capacity 45-75% of normal; accessory muscles and diaphragm are the primary support of breathing (a few intercostals are also available at the T4 level)
17. Poor to fair cough with FVC close to normal (60-95%)
18. Ineffective ventilation, generally due to poor chest wall movement in tetraplegia
19. Respiratory insufficiency
20. Maintain a clean airway, stay active, avoid smoking and smoky areas, avoid persons with respiratory infections, maintain good posture, and use bronchial hygiene and assisted cough techniques.
21. Promote ventilation and humidification of airways, prevent retention of secretions, increase respiratory muscle strength and endurance, and prevent pulmonary complications
22. Activity and hydration
23. To decrease the amount of effort required and to maximize the effectiveness of inspiration
24. Assisted cough, breathing exercises, incentive spirometry, ventilatory muscle training, intermittent positive-pressure breathing, and/or ultrasonic nebulizer
25. Increase hydration and frequency of bronchial hygiene efforts, monitor temperature, and notify the physician.
26. 7-10 days post-injury
27. Immobilize the area and patient to decrease the likelihood of breaking off parts of the clot and causing an embolism.
28. Sudden onset of hypoxia, dyspnea, and/or apprehension
29. Use low-molecular-weight-heparin starting as soon as possible following injury; change to oral anticoagulants during the rehabilitation phase of recovery, continuing for at least 8 weeks in persons with limited mobility.
30. Use pneumatic compression devices with or without graduated compression stockings during the early acute phase of recovery (2 weeks after injury), particularly for patients who are not candidates for thromboprophylaxis and for all children.
31. Those with injuries high above the thoracolumbar outflow of the sympathetic nervous system (injuries above T1)
32. Appropriate use of blankets, clothing, fans, air conditioning, spray bottles, etc.
33. Full bladder and full bowel
34. Elevated blood pressure, pounding headache, blotchy red skin above the level of the lesion, red flushed face, anxiety, sweating above the level of the lesion, slow heart rate, stuffy nose
35. Check the patient’s blood pressure, and then elevate the head.
36. After the bladder check and before bowel disimpaction
37. Elastic stockings or leg wraps, abdominal binder applied before sitting up, slow acclimation to upright position, and mobilization as soon as possible
38. Don’t place abdominal binder over rib cage; don’t leave the patient unattended if there is a risk of fainting.

39. Persons with SCI have both motor and sensory deficits.

40. Pressure injury preventive care strategies:
   - Identifying patients who are at risk and taking appropriate precautions
   - Individualizing turning and seating schedules
   - Educating patients and consistently role modeling appropriate care
   - Using correct techniques for transfers and moving up in bed to avoid friction or trauma to skin
   - Providing regular skin inspection and using skin care strategies that decrease the risk of trauma or breakdown (using appropriate moisturizers, keeping skin clean and dry, avoiding placement of rubber/plastic pads next to skin, controlling incontinence, using patient handling devices to decrease shearing, etc.)
   - Monitoring nutrition, weight, and essential labs
   - Using appropriate pressure relief devices
   - Actively monitoring for early signs of redness (blanches and fades in less than 10 minutes?); immediately removing and addressing causes

41. Frequent turning and proper positioning

42. Factors affecting the wound at the site are necrotic tissue (eschar, slough), foreign bodies (gauze shred, sutures), lack of moisture (heat lamps, exposure to air), and infection.

43. Systemic factors are age, health status, hypotension, anemias, edema, pulmonary disease, irradiated tissue, diabetes mellitus, acute conditions (e.g., infectious process, fever), and nutritional factors. (During wound healing caloric intake should be 2500-4000 daily, protein-albumin 3.0 grams, with vitamin/mineral supplements, especially zinc, vitamin A, and vitamin C).

44. The correct answers are:
   a) Alginate
   b) Hydrocolloid
   c) Transparent film
   d) Hydrogel
   e) Gauze

45. Intervention strategies are different after reflexes have returned.

46. Bulbocavernous and anal wink reflexes return; spontaneous reflex emptying may occur.

47. False

51. True

52. False

53. See table below.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflex</td>
<td>UMN</td>
<td>Yes</td>
<td>Yes</td>
<td>Hyper</td>
<td>Reflex emptying without voluntary recognition or control</td>
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<tr>
<td>Auto-omnous</td>
<td>LMN</td>
<td>Yes</td>
<td>Yes</td>
<td>Hypo</td>
<td>Leakage and smearing</td>
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<tr>
<td>Motor paralytic</td>
<td>LMN</td>
<td>Yes</td>
<td>No</td>
<td>Hypo</td>
<td>Leakage and smearing</td>
</tr>
<tr>
<td>Sensory paralytic</td>
<td>N/A</td>
<td>No</td>
<td>Yes</td>
<td>Hypo</td>
<td>Leakage and smearing</td>
</tr>
</tbody>
</table>

54. UMN

55. The correct answers are:
   a) Saline
   b) Irritant/stimulant
   c) Bulk-forming
   d) Lubricant

56. If the patient is actively diuresing, use indwelling catheters to avoid overdistention.

57. Clean

58. Risk is increased due to the possible development of disuse osteoporosis secondary to limited weight bearing on long bones and loss of muscle tension, if there is no spasticity, on the bones.

59. Drowsiness, weakness, nausea, and vomiting

60. False

61. True

62. True

63. True

64. True

65. False

66. False

67. True

68. False

69. True

70. True

71. False

72. Use intact areas of sensation and eyes to compensate for sensory loss. Protect areas that have limited sensation. Dress appropriately for the weather. Control the environment to prevent hypothermia or heat stroke. Practice wheelchair skills and safety; know how to get up from falls. Alert community response teams to your needs. Use good judgment when traveling in the community; seek assistance as necessary.

~Chapter 17~ Care of Patients: Other Neurological Diagnoses

1. Anti-inflammatories are used to speed relief of current symptoms; they do not change outcomes.

2. Stress, overheating, over-exercising, and infection
3. Planned exercise, adaptation of environment, use of energy-saving appliances, and other energy-conservations strategies.

4. Understand that there may be mixed patterns of neurogenic deficits; management strategies may need to change frequently to match the disease presentation.

5. They can further stimulate/irritate an already hyperactive bladder and increase urgency.

6. Paralysis of respiratory muscles

7. Range of motion, ice, and heat are effective for mild to moderate pain. As the disease progresses, the need for anti-inflammatory and anti-spasticity medications increases. In the final stages of the disease, opioids may be needed (and they also relieve air-hunger and anxiety).

8. Life support, development of living will, and respite care

9. Respiratory

10. Complete

11. Immobility

12. Breathlessness

13. Overstressed

14. Energy conservation, work simplification, frequent rest periods, use of adaptive equipment, and cautious use of exercise to improve endurance and strength

15. False

16. Orthostatic hypotension, cardiac irregularities, urinary retention, constipation, and anorexia

17. Give them on time to facilitate symptom management and maximize function.

18. Facilitate weight-bearing and functional mobility

19. There is an increase in the number of calories that those with cerebral palsy burn due to spasticity. Oral feeding also becomes very difficult, which increases the length of time it takes to eat. Some interventions for nutrition problems include use of adaptive equipment, special feeding techniques, special diets, and enteral support.

20. Poor oral motor control may impair speech (dysarthria). Some strategies used to enhance communication skills are speech therapy, communication boards, and computerized communication devices.

21. Lower extremities are flaccid, and sensation is impaired. Generally, a wheelchair with protective seat cushions is required for mobility. Patients must learn to position their lower extremities properly to prevent injury.

22. Cognitive problems are related to severity of hydrocephalus, if present.

23. Patients are at risk for excessive weight gain that limits mobility, which may increase the risk of skin breakdown, especially if seated in an ill-fitting chair.

24. Expect flaccid bowel, which requires a regular routine and appropriate stool consistency. ACE procedure provides best results for avoiding complications and incontinence.

25. Expect flaccid bladder, which is generally managed with intermittent catheterization. A Mitrofanoff stoma may be used to improve continence and reduce complications.

~Chapter 18~ Care of Patients: Other Diagnoses

**Amputation**

1. The impacts of peripheral vascular disease and diabetes mellitus on the healing of amputation wounds may include slow wound healing, wound breakdown, infection, malnutrition, or sepsis.

2. Sufficient oxygenation, hemoglobin, circulation, and nutrition (protein, vitamins, and minerals)

3. Protect the wound bed and maintain its moisture, prevent infection, and manage comorbidities.

4. To make it easier to fit/wear a prosthesis and prevent complications from edema

5. Things to remember when using a figure-8 wrap:
   - Wrap with greater compression distally.
   - Rewrap every 4 hours or more often, if needed, to prevent slipping and bunching.
   - Wrap smoothly around end of stump and avoid dog-ears.

6. Develop supportive relationships, support through the process of mourning, encourage handling of residual limb, reinforce support system, keep the patient informed, and encourage participation in care.

7. Acknowledge the reality of the risk, teach preventive care, and arrange for and encourage regular follow-up care.

8. Do not use a pillow under limb; adduct limb, support with trochanter roll, lay prone, and use resistive exercises.

9. Lay prone, use resistive exercises, use amputee board in wheelchair, and do not use a pillow under knee.

10. **Phantom sensations:** sense that the limb is still there

11. **Phantom pain:** feeling of pain in limb not there

12. **Skin breakdown and instability**

**Osteoarthritis**

13. Damage to weight-bearing joints, which limits mobility

14. Resting the involved joint, heat, cold, ultrasound, NSAIDs, supportive devices, inter-articular steroid injections, weight loss for obese patients, and appropriate exercise

15. To relieve pain, restore function, and improve joint stability

16. No flexion beyond 90 degrees, avoid hip adduction, avoid bending over, do not cross legs

17. False

**Rheumatoid Arthritis**

18. Energy-conservation strategies should include:
   - Alternate rest/activity.
• Prioritize and schedule activities.
• Delegate as necessary.
• Use work areas of appropriate height.
• Sit instead of stand.
• Avoid a large purse; distribute items in pockets.
• Modify the environment.
• Simplify work; use energy-saving tools and devices.

19. Instructions may include:
• Stop activity when pain increases.
• Use proper body mechanics.
• Change position frequently.
• Alternate activities.
• Sleep on a supportive, comfortable surface.

20. Osteoarthritis
21. Rheumatoid arthritis
22. Rheumatoid arthritis
23. Rheumatoid arthritis
24. Rheumatoid arthritis
25. Rheumatoid arthritis
26. Rheumatoid arthritis
27. Osteoarthritis
28. Osteoarthritis
29. Osteoarthritis
30. Osteoarthritis
31. Rheumatoid arthritis
32. Osteoarthritis

CHRONIC PAIN SYNDROME
33. Neuropathic: shoulder/hand syndrome, reflex sympathetic dystrophy, or neuromas
34. Nociceptive: stomachache, surgical pain, or burns
35. Relaxation, visualization, distraction, biofeedback, exercise, massage, heat/cold therapy, and acupuncture, to name a few
36. Non-opioid and adjuvants

OSTEOPOROSIS
37. Disuse osteoporosis
38. Low-calcium diet, inactivity, smoker, regular alcohol intake, high caffeine intake, lean, medication side effects
39. Adequate hydration, early mobilization, VTE prophylaxis, and adequate oxygenation

CARDIOPULMONARY
40. Airway, ventilation, breathing, gas
41. Restrictive
42. Restrictive
43. Obstructive
44. Obstructive
45. Restrictive
46. Restrictive
47. Restrictive
48. Obstructive
49. Obstructive
50. Restrictive
51. Restrictive
52. The occurrence of dyspnea or pain during the activity, lack of available suction for patients with copious secretions, obesity, predisposition toward pathological fractures
53. Pursed-lip breathing, upright positioning, deep breathing/incentive spirometry, diaphragmatic breathing techniques
54. Limit physical and psychological consequences of the acute cardiac illness
55. Risk assessment, early physical activity, and education
56. Healthy lifestyle, including smoking cessation, weight loss, stress management, nutrition, medication management, and lifelong need for exercise
57. Individualized program based on medical history, testing, current status, lifestyle, and level of fitness
58. Fatigue, angina, dizziness, dyspnea, nausea, change in cardiac rhythm, increased heart rate greater than 20 beats per minute, increase in blood pressure outside of recommended range, decreased heart rate more than 10 beats per minute, or decrease in systolic pressure more than 10 mmHg
59. Able to walk up two flights of stairs without shortness of breath or angina
60. Simulated work-related tasks, cardiovascular conditioning, body mechanics, and stress management. (The Rehab Nursing Series™ provides additional training for cardiopulmonary comorbidities in the course Cardiopulmonary Rehabilitation. You can find information at www.rehabclassworks.com/Cardio.htm.

CANCER
61. Fatigue can contribute to difficulty remembering, inability to finish activities, decreased social interactions, and decreased ability to meet personal and homemaking needs.
62. Improve quality of sleep, provide counseling to facilitate positive coping, and teach energy-management/conservation strategies.

BURNS
63. Protection against infection/trauma, identification/body image/identity, regulation of body temperature/sweating, fluid and electrolyte balance, sensory functions, and metabolism of vitamin D
64. Duration of exposure, degree of tissue temperature elevation
65. Protein-energy malnutrition, which lasts until wounds are healed
66. Increased infection rate (immunosuppression), metabolic exhaustion, increased wound healing time, and increased weight/muscle loss that can be in excess of 10% of body weight
67. It may last years, as collagen fibers reorganize.
68. They may develop neck flexion contractures, which may in turn affect eating and speech patterns.
69. Stretching all involved areas to increase range of motion (may be passive or active)
70. Skin is more prone to burning due to a decreased sensitivity to heat and the sun. Increased pigmentation can occur from sun exposure.
71. There are fewer nerve endings. Sensation will never be the same. The patient must use extra caution.
72. Physical capacity evaluation and functional capacity evaluation are used to measure strength, grip, range of motion, etc. They determine the impact of the injury, identify safety issues, and indicate readiness to return to work.