Spotlight Figures

Spotlight Figures are one- or two-page presentations that integrate text and art to communicate physiological, organizational, or clinical information in a visually effective format.

Clear steps use text and art to guide students through complex processes.

NEW The Tenth Edition has 18 new Spotlight Figures for a total of 50, including at least one in every chapter.
Endochondral ossification begins with the formation of a hyaline cartilage. As the cartilage continues to grow, it becomes ensheathed by osteoblasts. The shaft increases greatly in length and diameter. Bone formation begins with the formation of a hyaline cartilage near each epiphyseal side, new cartilage is produced at the same rate. The situation is like a pair of joggers, one in front of the other. As long as they are running at the same speed, they can run for miles without colliding. In this case, the osteoblasts and the epiphysis are both "running away" from the primary ossification center. As a result, the osteoblasts never catch up with the epiphysis, and the bone continues to grow longer and longer.

The epiphyses eventually become filled with spongy bone. The metaphysis, a relatively narrow cartilaginous region called the epiphyseal cartilage, or epiphyseal plate, now separates the epiphysis from the diaphysis. On the shaft side of the metaphysis, osteoblasts continuously invade the cartilage and replace it with bone. New cartilage is produced at the same rate on the epiphyseal side. The cartilage prevents damaging the joint from bone-to-bone contact.

At puberty, the rate of epiphyseal cartilage production slows and the rate of osteoblast activity accelerates. As a result, the epiphyseal cartilage gets narrower and narrower, until it ultimately disappears. This event is called epiphyseal closure. The former location of the epiphyseal cartilage becomes a distinct epiphyseal line that remains after epiphyseal growth has ended.

**NEW** There is one coordinating Spotlight Figure for every A&P Flix available in MasteringA&P.

The explanation is built directly into the illustration for efficient and effective learning.

The all-in-one-place presentation means no flipping back and forth between narrative and illustration to get the full story.

**NEW Spotlight Figure Coaching Activities**

One Spotlight Figure in each chapter now has an assignable Coaching Activity in MasteringA&P.
Clinical Notes appear within every chapter, expand upon topics just discussed, and present diseases and pathologies along with their relationship to normal function.

### Clinical Note

**Carpal Tunnel Syndrome** The carpal bones articulate with one another at joints that permit limited sliding and twisting. Ligaments interconnect the carpal bones and help stabilize the wrist joint. The tendons of muscles that flex the fingers pass across the anterior surface of the wrist. These tendons are sandwiched between the intercarpal ligaments and a broad, superficial transverse ligament called the *flexor retinaculum*. Inflammation of the connective tissues between the *flexor retinaculum* and the carpal bones can compress the tendons and the adjacent *median nerve*. The result is pain, weakness, and reduced wrist mobility. This condition is called *carpal tunnel syndrome*.

### Related Clinical Terms

- **ankylosing spondylitis**: A chronic, progressive inflammatory disease of the intervertebral spaces that causes abnormal fusion of the vertebrae.
- **arthroplasty**: The surgical reconstruction or creation of an artificial joint.
- **arthroscopy**: Insertion of a narrow tube containing optical fibers and a tiny camera (arthroscope) directly into the joint for visual examination.
- **Bouchard's nodes**: Bony enlargements on the proximal interphalangeal joints due to osteoarthritis.
- **chondromalacia**: Softening of cartilage as a result of strenuous activity or an overuse injury.
- **Heberden's nodes**: Bony overgrowths on the distal interphalangeal joints due to osteoarthritis that cause the patient to have knobby fingers.
- **joint mice**: Small fibrous, cartilaginous, or bony loose bodies in the synovial cavity of a joint.
- **Lyme disease**: An infectious disease transmitted to humans from the bite of a tick infected with *Borreia burgdorferi*, causing flu-like symptoms and joint pain.
- **pannus**: Granulation tissue (combination of fibrous connective tissue and capillaries) forming within a synovial membrane, which releases cartilage-destroying enzymes.

### Examples of Clinical Notes:

- **Congenital Talipes Equinovarus**
  - Chapter 8, page 258
- **Abnormal Bone Development**
  - Chapter 6, page 196
- **AIDS**
  - Chapter 22, page 819
NEW Clinical Cases get students motivated for their future careers. Each chapter opens with a story-based Clinical Case related to the chapter content.

**CLINICAL CASE**

When Your Heart Is in the Wrong Place

Five-year-old Jackson came home from kindergarten with yet another ear infection. He is a happy child with a great appetite, but he can’t seem to stay healthy. His nose is constantly plugged, and he always has a nasty cough. Sometimes he coughs so hard he vomits.

Jackson has been checked for cystic fibrosis, a genetic disease that causes thick, sticky, mucus secretions, to be sure this was not the cause of his earaches and chronic cough. There are no pets or smokers in the home.

Because this cough has gone on so long, Jackson is now getting a chest x-ray. The radiology technologist asked if she could take another film and carefully checked to be sure she had the “right” marker on Jackson’s right side.

“Now that’s funny,” the tech said. “It looks like this x-ray is backward, but I know I took it correctly. Jackson’s heart must be on the wrong side.” Could Jackson’s heart really be on the wrong side? To find out, turn to the Clinical Case Wrap-Up on p. 112.

Each chapter ends with a Clinical Case Wrap-Up that incorporates the deeper content knowledge students will have gained from the chapter.

Examples of Clinical Cases:

- **A Case of Child Abuse?**  
  Chapter 6, page 179

- **A Chance to See**  
  Chapter 17, page 565

- **A Real Eye Opener**  
  Chapter 10, page 290

MasteringA&P®

NEW Book-specific Clinical Case Activities

Every Clinical Case has a related assignable Activity in MasteringA&P.
NEW Interactive and Adaptive Capabilities

- **Adaptive Follow-Up Assignments** allow teachers to easily assign personalized content for each individual student based on strengths and weaknesses identified by his or her performance on MasteringA&P parent assignments.

- **Dynamic Study Modules** help students acquire, retain, and recall information faster and more efficiently than ever before. The flashcard-style modules are available as a self-study tool or can be assigned by the teacher. They can be easily accessed with smartphones.

- **Learning Catalytics** is a “bring your own device” (laptop, smartphone, or tablet) student engagement, assessment, and classroom intelligence system. With Learning Catalytics, teachers can assess students in real time using open-ended tasks to probe student understanding.

NEW A&P Flix™ Coaching Activities

Bring interactivity to these popular 3D movie-quality animations by asking students to manipulate the visuals.

Video Tutor Coaching Activities

Instruct and coach students on key A&P concepts from the book and are accompanied by questions with video hints and feedback specific to their misconceptions.
**NEW Spotlight Figure Coaching Activities**

Bring interactivity to the Spotlight Figures from the book by asking students to manipulate the visuals.

**Interactive Physiology Coaching Activities**

Help students dive deeper into complex physiological processes using the Interactive Physiology tutorial program.

**Also Assignable in MasteringA&P®:**

- **Art-labeling Activities** are drag and drop activities that allow students to assess their knowledge of terms and structures.
- **Art-based Questions** are conceptual questions related to art and instruct students with wrong-answer feedback.
- **NEW Book-specific Clinical Case Activities** stem from the story-based Clinical Cases in the book.
- **NEW Clinical Note Activities** prepare students for future careers in allied health fields.
- **Chemistry Review Activities** reinforce chemistry concepts necessary for an understanding of A&P.
- **PAL 3.0 and assessments**
- **PhysioEx 9.1 and assessments**
- **Reading Quiz Questions**
- **Chapter Test Questions**
- **Test Bank Questions**
Mastering A&P® Study Area

Mastering A&P® includes a Study Area that will help students get ready for tests with its simple three-step approach. Students can:

1. Take a pre-test and obtain a personalized study plan.
2. Learn and practice with animations, labeling activities, and interactive tutorials.
3. Self-test with quizzes and a chapter practice test.

Practice Anatomy Lab™ (PAL™) 3.0 is a virtual anatomy study and practice tool that gives students 24/7 access to the most widely used lab specimens, including the human cadaver, anatomical models, histology, cat, and fetal pig. PAL 3.0 is easy to use and includes built-in audio pronunciations, rotatable bones, and simulated fill-in-the-blank lab practical exams.

NEW The PAL 3.0 App lets you access PAL 3.0 on your iPad or Android tablet. With the pinch-to-zoom feature, images can be instantly enlarged.

Also Available in the Study Area: • eText • PhysioEx 9.1 • Video Tutors
A&P Flix™

are 3-D movie-quality animations with self-paced tutorials and gradable quizzes that help students master the toughest topics in A&P:

- NEW Protein Synthesis
- Membrane Transport
- DNA Replication
- Mitosis
- NEW Endochondral Ossification
- Events at the Neuromuscular Junction
- The Cross Bridge Cycle
- Excitation-Contraction Coupling
- Resting Membrane Potential
- Generation of an Action Potential
- Propagation of an Action Potential
- NEW The Stretch Reflex
- NEW The Mechanism of Hormone Action: Second Messenger cAMP
- Origins, Insertions, Actions, and Innervations Over 60 animations on this topic
- Group Muscle Actions and Joints Over 50 animations on this topic

Interactive Physiology® (IP)

helps students understand the hardest part of A&P: physiology. Fun, interactive tutorials, games, and quizzes give students additional explanations to help them grasp difficult concepts.

Modules:
- Muscular System
- Nervous System I
- Nervous System II
- Cardiovascular System
- Respiratory System
- Urinary System
- Fluids & Electrolytes
- Endocrine System
- Digestive System
- Immune System
Program Components

MasteringA&P®

is the most effective and powerful online tutorial, homework, and assessment system for the sciences. MasteringA&P with Pearson eText delivers self-paced tutorials that focus on your course objectives, provide individualized coaching, and respond to each student’s progress. The Mastering system is designed with the single purpose of helping your students reach more moments of true understanding that lead to better results. Upon textbook purchase, students and teachers are granted access to MasteringA&P. High school teachers can obtain preview or adoption access for MasteringA&P in one of the following ways:

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- With the purchase of this program, a Pearson Adoption Access Card with Instructor Manual, will be delivered with your textbook purchase. (ISBN: 0-13-353986-5)
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Students, ask your teacher for access.

For the Teacher

Some of the teacher supplements and resources for this text are available electronically to qualified adopters on the Instructor Resource Center (IRC). Upon adoption or to preview, please go to www.pearsonschool.com/access_request and select Instructor Resource Center. You will be required to complete a brief one-time registration subject to verification of educator status. Upon verification, access information and instructions will be sent to you via email. Once logged into the IRC, enter ISBN 978-0-13-348122-8 in the “Search our Catalog” box to locate resources. Electronic teacher supplements are also available within the Instructor’s tab of MasteringA&P.

**Instructor Resource DVD (IRDVD)**
with Lecture Outlines by Lee Ann Frederick and Clicker Questions by Rene Salazar

The IRDVD organizes all teacher media resources by chapter into one convenient and easy-to-use package. Highlights include, Customizable PowerPoint Lecture Presentations, all figures from the book in JPEG format and PowerPoint slides, A&P Flix 3-D movie-quality animations, IP-10 10-System Suite Exercise Sheets and Answer Key, Test Bank in TestGen, Instructor’s Manual, Transparencies and the IRDVD for PAL 3.0.

**ExamView® CD-ROM**
The ExamView® computerized test bank CD-ROM includes hundreds of questions, allowing teachers to build, edit, print, and administer tests based on text objectives. Algorithmically based, ExamView® enables teachers to create multiple but equivalent versions of the same question or test with a click of a button.

**Instructor’s Manual**
This useful resource includes a wealth of materials to help teachers organize their classes, such as discussion and lab ideas, analogies, demonstrations, vocabulary aids, applications, common student misconceptions/problems, and classroom demonstrations.
Support for Students

i Get Ready for A&P
by Lori K. Garrett
978-0-321-81336-7 / 0-321-81336-7
This book and online component were created to help students be better prepared for their A&P course. Features include pre-tests, guided explanations followed by interactive quizzes and exercises, and end-of-chapter cumulative tests. Also available in the Study Area of MasteringA&P.

i Interactive Physiology®
10-System Suite (IP-10)
CD-ROM
IP helps students understand the hardest part of A&P: physiology. Fun, interactive tutorials, games, and quizzes give students additional explanations to help them grasp difficult physiological concepts.

i Martini’s Atlas of
the Human Body
by Frederic H. Martini
The Atlas offers an abundant collection of anatomy photographs, radiology scans, and embryology summaries, helping students visualize structures and become familiar with the types of images seen in a clinical setting.

i Practice Anatomy
Lab™ (PAL™) 3.0 DVD
by Ruth Heisler, Nora Hebert, Jett Chinn, Karen Krabbenhoft, and Olga Malakhova
978-0-321-68211-6 / 0-321-68211-4
PAL 3.0 is an indispensable virtual anatomy study and practice tool that gives students 24/7 access to the most widely used lab specimens, including the human cadaver, anatomical models, histology, cat, and fetal pig.
Also Available: PAL 3.0 Lab Guide

i A&P Applications
Manual
by Frederic H. Martini and Kathleen Welch
978-0-321-94973-8 / 0-321-94973-0
This manual contains extensive discussions on clinical topics and disorders to help students apply the concepts of anatomy and physiology to daily life and their future health professions.

i PhysioEx™ 9.1
Laboratory Simulations in Physiology
by Peter Zao, Timothy Stabler, Lori A. Smith, Andrew Lokuta, and Edwin Griff
978-0-321-92964-8 / 0-321-92964-0
This easy-to-use laboratory simulation software and lab manual consists of 12 exercises containing 63 physiology lab activities that can be used to supplement or substitute wet labs safely and cost-effectively. Now with input data variability.

The following supplements are available for purchase.

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