Get Ready for a Whole New Mastering Experience

**NEW! Ready-to-Go Teaching Modules** help instructors find the best assets to use before, during, and after class to teach the toughest topics in A&P. Created by teachers for teachers, these curated sets of teaching tools save you time by highlighting the most effective and engaging animations, videos, quizzing, coaching and active learning activities from MasteringA&P.
NEW! SmartArt Videos help students navigate select, complex pieces of art for some of the toughest topics in A&P. Author Kevin Petti walks students through several figures and provides additional background and detail. The videos can be accessed via QR codes in the book and offer accompanying assignments through Mastering A&P.
Spotlight Figures provide highly visual one- and two-page presentations of tough topics in the book, with a particular focus on physiology.

**SPOTLIGHT**

**Figure 10-11**

**Excitation–Contraction Coupling**

1. **Neural Control**
   A skeletal muscle fiber contracts when stimulated by a motor neuron at a neuromuscular junction. The stimulus arrives in the form of an action potential at the axon terminal.

2. **Excitation**
   The action potential causes the release of ACh into the synaptic cleft, which leads to excitation—the production of an action potential in the sarcolemma.

3. **Release of Calcium Ions**
   This action potential travels along the sarcolemma and down T tubules to the triads. This triggers the release of calcium ions (Ca\(^{2+}\)) from the terminal cisternae of the sarcoplasmic reticulum.

4. **Contraction Cycle Begins**
   The contraction cycle begins when the calcium ions (Ca\(^{2+}\)) bind to troponin, resulting in the exposure of the active sites on the thin filaments. This allows cross-bridge formation and will continue as long as ATP is available. (See Spotlight Figure 10-11 for the details of the contraction cycle.)

5. **Sarcomere Shortening**
   As the thick and thin filaments interact, the sarcomeres shorten, pulling the ends of the muscle fiber closer together.

6. **Generation of Muscle Tension**
   During the contraction, the entire skeletal muscle shortens and produces a pull, or tension, on the tendons at either end.

NEW! MasteringA&P references within the chapter direct students to specific digital resources, such as tutorials, animations, and videos, that will help further their understanding of key concepts in the course.
NEW! Build Your Knowledge features show how each body system influences the others. As students progress through the book, they will build their knowledge about how the body systems work together to maintain homeostasis.
Clinical Cases get students motivated for their future careers. Each chapter opens with a story-based Clinical Case related to the chapter content and ends with a Clinical Case Wrap-Up.

Clinical Notes appear within every chapter and expand upon topics just discussed. They present diseases and pathologies along with their relationship to normal function.

Clinical Terms end every chapter with a list of relevant clinical terms and definitions.

**Related Clinical Terms**

- **carbuncle**: A skin infection that often involves a group of hair follicles. The infected material forms a lump, which occurs deep in the skin; the medical term for multiple boils.
- **cold sore**: A lesion that typically occurs in or around the mouth and is caused by a dormant herpes simplex virus that may be reactivated by stressors such as stress, fever, or sunburn. Also called fever blister.
- **comedo**: The primary sign of acne consisting of an enlarged pore filled with skin debris, bacteria, and sebum (oil); the medical term for a blackhead.
- **dermatology**: The branch of medicine concerned with the diagnosis, treatment, and prevention of diseases of the skin, hair, and nails.
- **eczema**: Rash characterized by inflammation, itching, dry, scaly, or irritated skin.
- **frostbite**: Injury to body tissue caused by exposure to below-freezing temperatures, typically affecting the nose, fingers, or toes and sometimes resulting in gangrene.
- **furuncle**: A skin infection involving an entire hair follicle and nearby skin tissue; the medical term for a boil.
- **gangrene**: A term that describes dead or dying body tissue that occurs because the local blood supply to the tissue is either first or inadequate to keep the tissue alive.
Continuous Learning
Before, During, and After Class

**Dynamic Study Modules** enable students to study more effectively on their own. With the Dynamic Study Modules mobile app, students can quickly access and learn the concepts they need to be more successful on quizzes and exams.

**NEW!** Instructors can now select which questions to assign to students.

**NEW!** SmartArt Videos help students navigate some of the complex figures in the text. They are accessible via QR code in the book and are assignable in MasteringA&P.
**Learning Catalytics** is a “bring your own device” (laptop, smartphone, or tablet) engagement, assessment, and classroom intelligence system. Students use their device to respond to open-ended questions and then discuss answers in class based on their responses.

“My students are so busy and engaged answering Learning Catalytics questions during lecture that they don’t have time for Facebook.”

—Declan De Paor, Old Dominion University
**NEW!** Interactive Physiology 2.0 helps students advance beyond memorization to a genuine understanding of complex physiological processes. Fun, interactive tutorials, games, and quizzes give students additional explanations to help them grasp difficult concepts. IP 2.0 features brand-new graphics, quicker navigation, and more robust interactivity.

**NEW IP 2.0 modules include:**
- Resting Membrane Potential
- Electrical Activity of the Heart
- Cardiac Output
- Factors Affecting Blood Pressure
- Generation of an Action Potential

**Coming Soon:**
- Cardiac Cycle
- Glomerular Filtration
- Neuromuscular Junction
- Tubular Reabsorption and Secretion
- Excitation Contraction Coupling
More Practice, More Learning

**A&P Flix Coaching Activities** bring interactivity to these popular 3D movie-quality animations by asking students to answer questions related to the video.

Additional assignable MasteringA&P activities include:
- Spotlight Figure Coaching Activities
- Clinical Case Activities
- Clinical Note Activities
- Bone & Dissection Video Coaching Activities
- And More!

NEW! Beginning Fall 2017, all of the assignments from Wood's *Laboratory Manual for A&P featuring Martini Art, 6e* can be accessed in your *Fundamentals of A&P* Mastering course! Only one MasteringA&P code is needed to access these assignments.
Mastering A&P™ Lab Practice

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.

PhysioEx 9.1 is an easy-to-use lab simulation program that allows students to conduct experiments that are difficult in a wet lab environment because of time, cost, or safety concerns. Students are able to repeat labs as often as they like, perform experiments without animals, and are asked to frequently stop and predict within the labs.
Access the Complete Textbook
On or Offline with eText 2.0

**NEW!** The Eleventh Edition is available in Pearson’s fully-accessible eText 2.0 platform.*

**NEW!** The eText 2.0 mobile app offers offline access and can be downloaded for most iOS and Android phones and tablets from the iTunes or Google Play stores.

Powerful interactive and customization functions include instructor and student note-taking, highlighting, bookmarking, search, and links to glossary terms.

*The eText 2.0 edition will be live for Fall 2017 classes.
Instructor and Student Support

**NEW! The Art of Teaching A&P: Six Easy Lessons to Improve Student Learning**

by Lori K. Garrett

978-0-13-446951-5
0-13-446951-8

Author Lori Garrett (Get Ready for A&P) explores some of the most common challenges she’s encountered in her classroom when using art to teach anatomy and physiology. From describing the challenge to researching why it occurs and proposing solutions to address it, Lori provides insight into how students look at images. She presents ideas for how educators can best use figures and illustrations to teach complex concepts without overwhelming or discouraging their students.

A complete package of instructor resources includes:

- Customizable PowerPoint slides (with NEW! Annotations on how to present complex art during lecture)
- All figures from the book in JPEG format
- A&P Flix 3D movie-quality animations on tough topics
- Test Bank
- And more!

**A&P Applications Manual**

by Frederic H. Martini and Kathleen Welch

978-0-32-194973-8
0-32-194973-0

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. Free when packaged with the textbook.

**Get Ready for A&P**

by Lori K. Garrett

978-0-32-181336-7
0-32-181336-7

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. Free when packaged with the textbook.

**Martini’s Atlas of the Human Body**

by Frederic H. Martini

978-0-32-194072-8
0-32-194072-5

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. Free when packaged with the textbook.

**Study Card for Martini: Body Systems Overview**

978-0-13-460995-9
0-13-460995-6

A six-panel laminated card showing all body systems and their organs and functions. Free when packaged with the textbook.