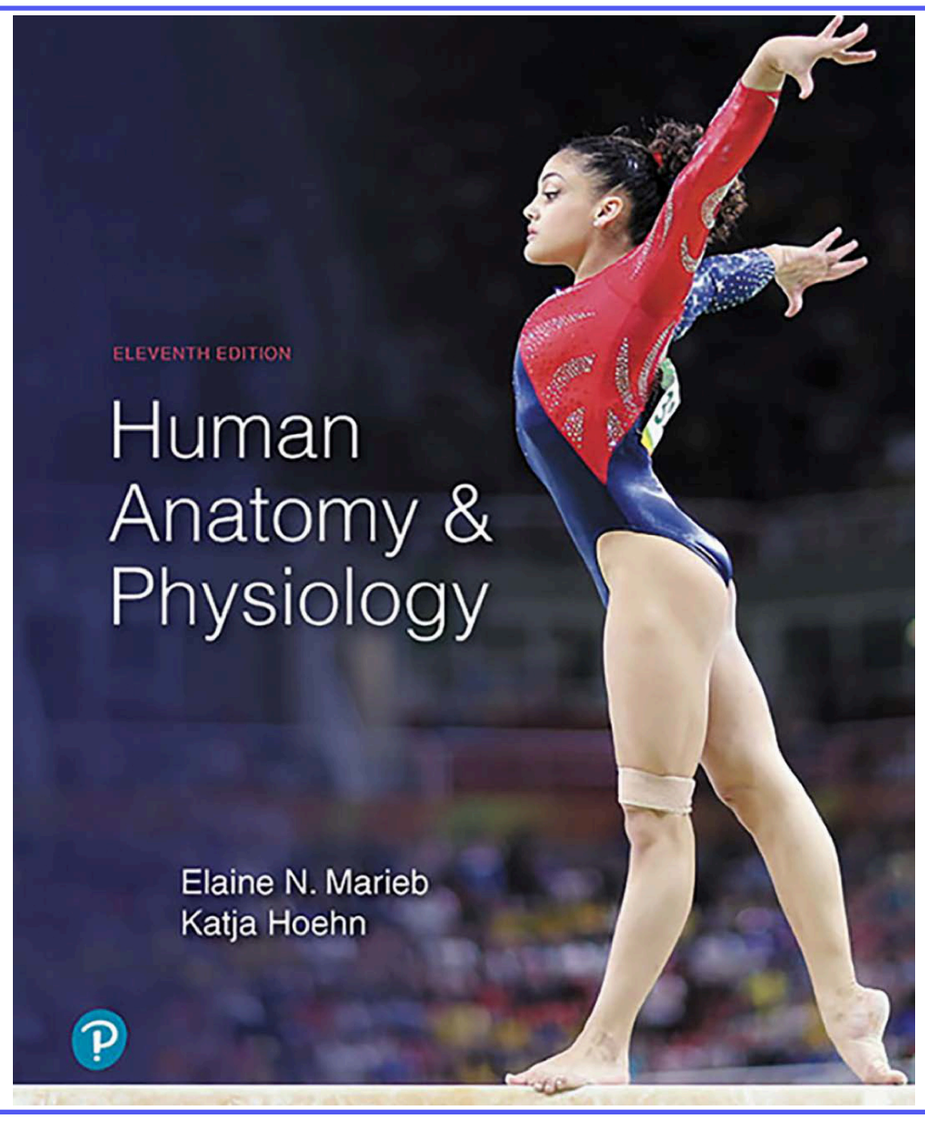


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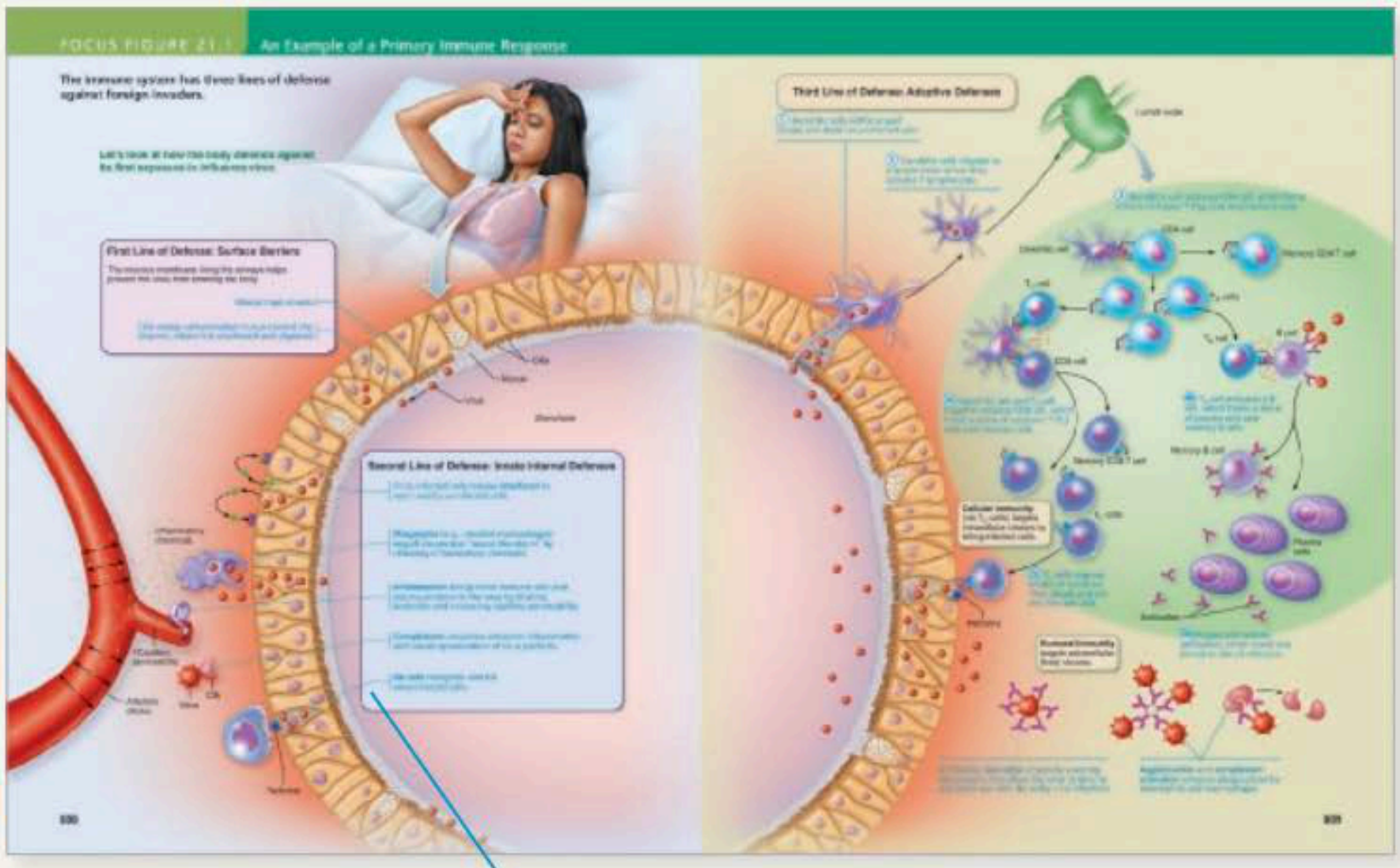
Study the Figures as You Read the Text

Anatomy and Physiology is a visual science. To succeed, you need to practice and develop visual literacy skills for understanding and interpreting information. To help you achieve this goal, the text and associated figures are tightly integrated so that you never have to flip pages back and forth to connect visuals with words.

EXPANDED! 6 new Focus Figures (for a total of 26) walk you through complex processes using exceptionally clear, easy-to-follow illustrations with integrated text explanations.

NEW Focus Figures are as follows:
3.1 The Plasma Membrane, *pp. 64–65*
11.4 Postsynaptic Potentials and Their Summation, *pp. 418–419*
16.2 Stress and the Adrenal Gland, *pp. 628–629*
18.2 The Cardiac Cycle, *pp. 694–695*
21.1 An Example of a Primary Immune Response, *pp. 808–809*
28.2 Fetal and Newborn Circulation, *pp. 1108–1109*

See pp. 808–809

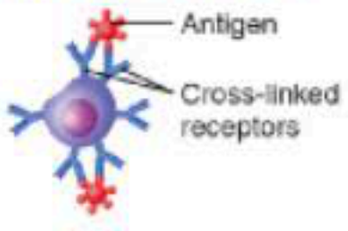


NEW! Focus Figure "Mini-Animation" Coaching Activities bring the 6 new Focus Figures to life using short video segments.

Blue text represents the voice of an A&P instructor, highlighting important points to remember.

Activation and Differentiation of B Cells

An immunocompetent but naive B lymphocyte is *activated* when matching antigens bind to its surface receptors and cross-link adjacent receptors together. Antigen binding is quickly followed by receptor-mediated endocytosis of the cross-linked antigen-receptor complexes. As we described previously, this is called *clonal selection* and is fol-



EXPANDED! 31 unique In-Line Figures are strategically placed within the text to visually reinforce the text discussion.

See p. 796

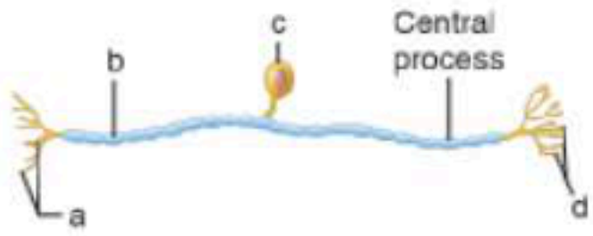
Apply Your Knowledge to a Range & Variety of Questions

As you build your knowledge and confidence in A&P, practice responding to the more challenging questions—you are likely to encounter similar questions on a test or licensing exam. Your extra effort will pay off at exam time!

NEW! A greater **variety and range of self-assessment questions** have been added to the **Check Your Understanding** sections within each chapter and include **Apply**, **Predict**, **What If?**, **Draw**, and **Make Connections**. Dozens of new **visual questions** ask you to label structures or interpret visual information.

Check Your Understanding

5. How does a nucleus within the brain differ from a nucleus within a neuron?
6. How is a myelin sheath formed in the CNS, and what is its function?
7. What is the structural classification of the neuron shown below? What is its usual functional classification? Name the parts labeled a–d.



8. APPLY Which structural and functional type of neuron is activated first when you burn your finger? Which type is activated last to move your finger away from the source of heat?
9. MAKE CONNECTIONS Which part of the neuron is its fiber? How do nerve fibers differ from the fibers of connective tissue (see Chapter 4) and the fibers in muscle (see Chapter 9)?

For answers, see Answers Appendix.

See p. 400

NEW! **"Draw" questions** ask you to create visuals that reinforce important concepts by drawing a structure, annotating a figure, or creating a summary table.

3. DRAW Create a summary table to help you study the pharynx by comparing and contrasting its three parts. For each part, identify what it conducts (air, food, or both), the type of epithelium found there, and the associated tonsils.

	Conducts	Epithelium	Tonsils
Nasopharynx	Air	Pseudostratified ciliated columnar	Pharyngeal Tubal
Oropharynx	Air and food	Stratified squamous	Palatine Lingual
Laryngopharynx	Air and food	Stratified squamous	—— (none)

See p. 824 and Answers Appendix

NEW! All of the **End-of-Chapter Review questions** are now organized into 3 levels of difficulty based on **Bloom's Taxonomy categories**:
Level 1: Remember/Understand
Level 2: Apply/Analyze
Level 3: Evaluate/Synthesize

Prepare for Your Future Career & Practice Solving Real-World Problems

The authors of this text, Elaine Marieb and Katja Hoehn, share insights from their own clinical experience to help you prepare for your future career in health care. All clinical examples and applications are signaled with an easy-to-find "Clinical" label.

UPDATED! Homeostatic Imbalance discussions alert you to the consequences of body systems not functioning optimally. Relevant photos have been added to selected discussions for visual reinforcement.

HOMEOSTATIC IMBALANCE 5.6

CLINICAL

Changes in nail appearance can help diagnose certain conditions. For example, yellow-tinged nails may indicate a respiratory or thyroid gland disorder. (Thickened yellow nails are usually due to a fungus infecting the nail.) An outward concavity of the nail (*koilonychia* or "spoon nail," **Figure 5.8**) may signal an iron deficiency. Horizontal lines (Beau's lines) across the nails can be a sign of severe illness that affects the whole body such as uncontrolled diabetes, a heart attack, or cancer chemotherapy.



Figure 5.8 Koilonychia.

See p. 161

UPDATED! Clinical Case Studies are provided at the end of Chapters 5–29 and challenge you to apply your knowledge to realistic clinical scenarios.

CLINICAL CASE STUDY

70-Year-Old Male with Polyuria

Mr. Gutteman, a 70-year-old male, was brought into the ER. He had been sick several days with the flu, and was found confused and barely conscious by his daughter.



Mr. Gutteman is breathing rapidly and has a fever of 39°C (102°F). His skin is dry and flaccid, his mucous membranes are dry, and his eyes are sunken. The physician ordered:

- IV (intravenous) fluid and electrolyte replacement
- Blood and urine tests for presence of glucose and ketones
- Strict I&O [careful measurement of fluid intake (e.g., IV, drinking) and output (e.g., urine)]

1. NCLEX-STYLE You would expect high levels of blood glucose and the presence of glucose and ketones in Mr. Gutteman's urine if:
   a. His pancreas is secreting too much insulin
   b. His liver is secreting too little insulin
   c. His pancreas is secreting too little insulin
   d. His liver is secreting too much glucagon

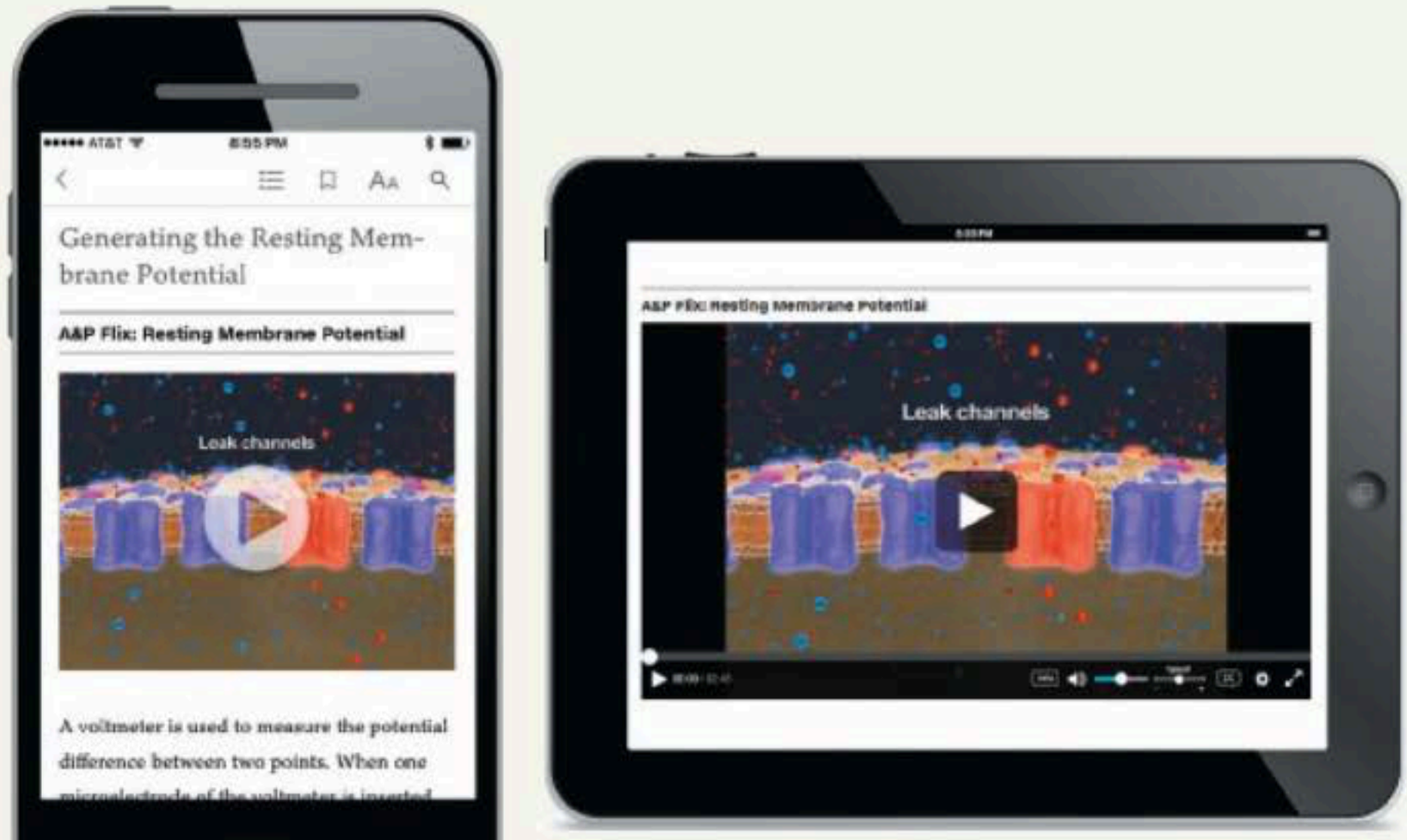
NEW! Each Clinical Case Study includes **"NCLEX-Style" questions** for practice with the kinds of challenge questions that you will eventually encounter on a licensing exam. Practice answering these questions on your own or in collaboration with classmates. Your instructor can also assign **new NCLEX-Style questions in Mastering A&P®**, along with Homeostatic Imbalance questions, Clinical Case Study Coaching Activities, and Nurses Need Physiology Case Studies.

See p. 641

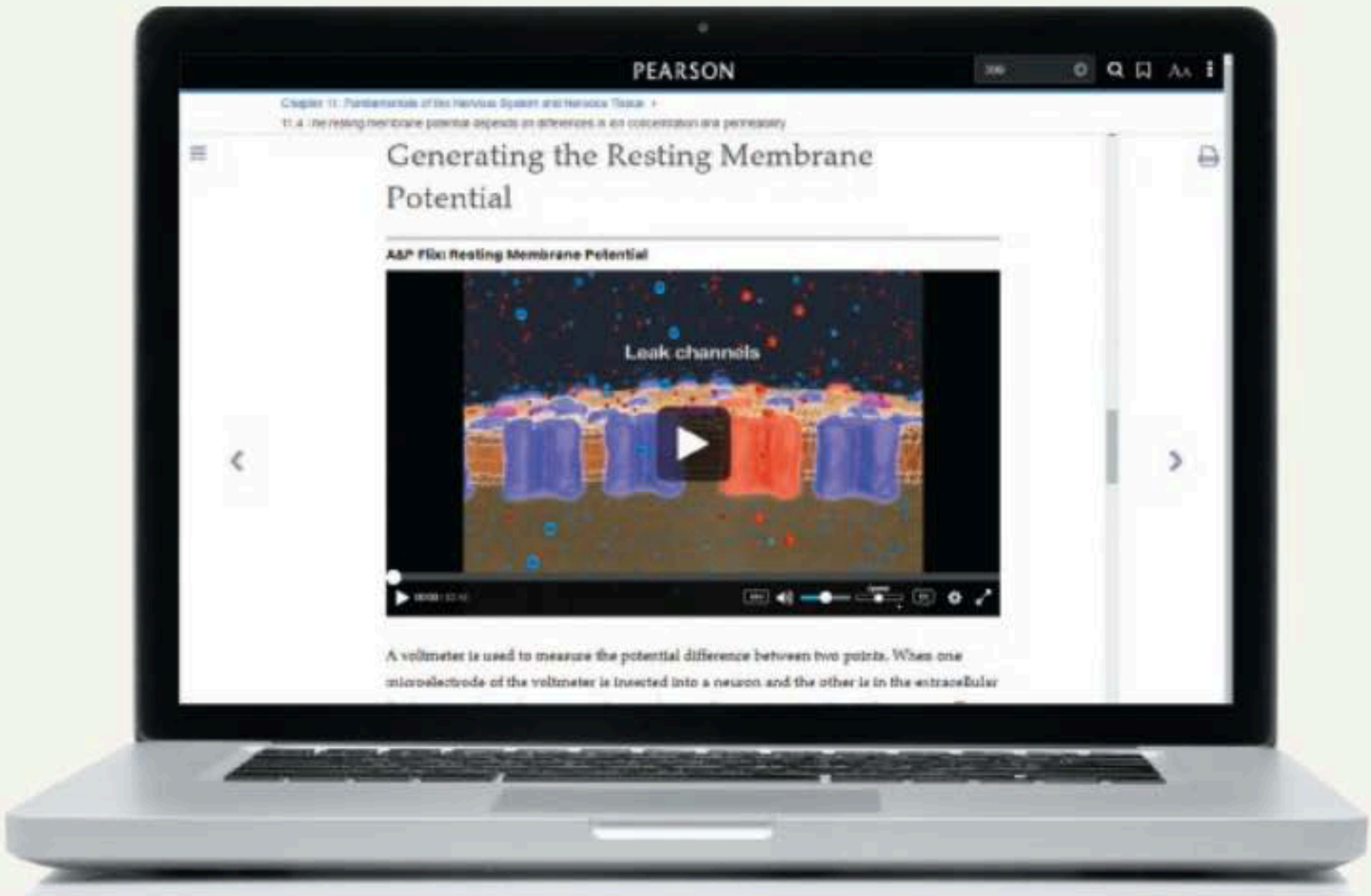
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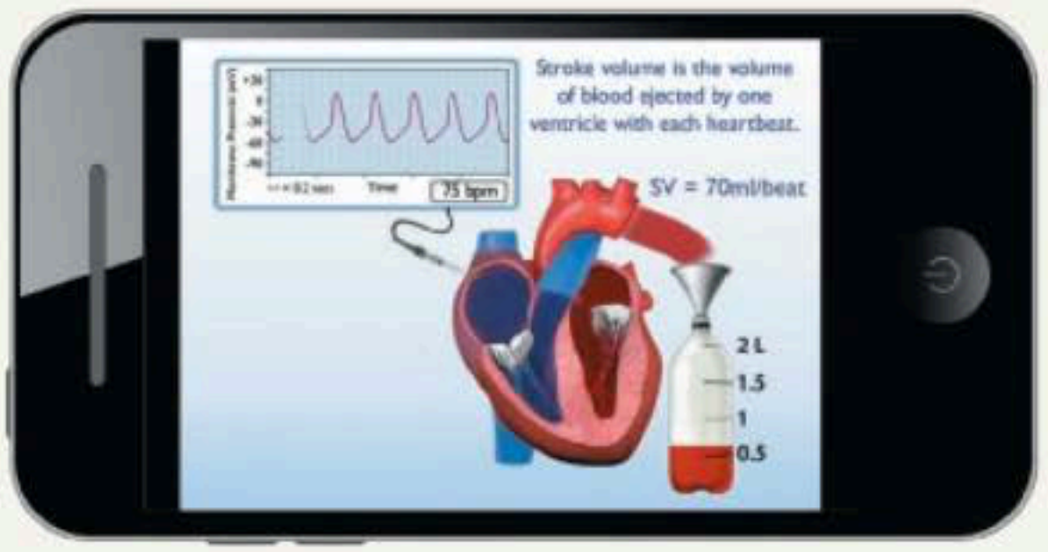
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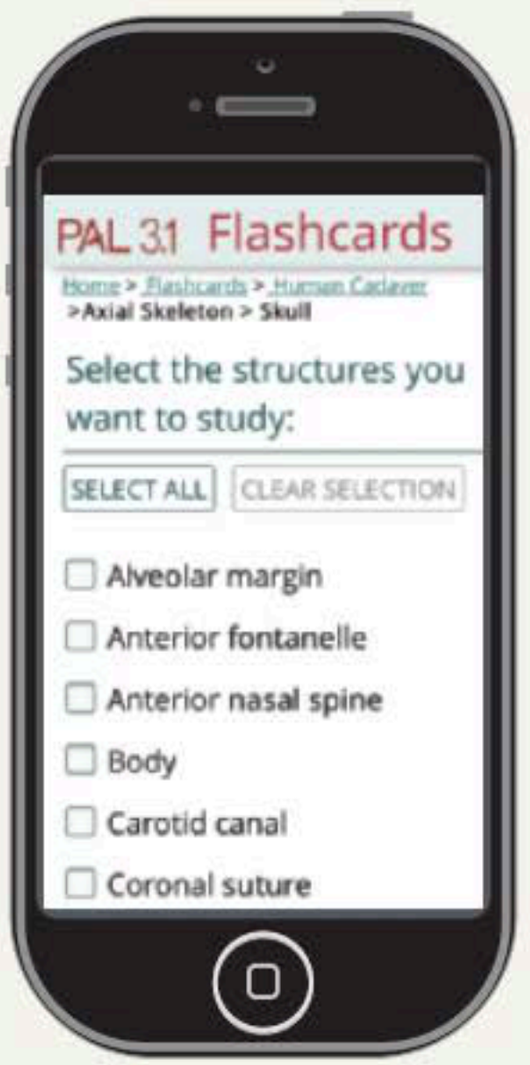
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EXPANDED! Interactive Physiology 2.0 Coaching Activities teach complex physiology processes using exceptionally clear animations, interactive tutorials, games, and quizzes. IP2 features new graphics, quicker navigation, and a mobile-friendly design. New topics include Generation of an Action Potential and Cardiac Cycle. IP2 and IP animations can be assigned from the Mastering A&P® item library or accessed through the Study Area.



NEW! PAL 3.1 Customizable Flashcards allow you to create a personalized, mobile-friendly deck of flashcards and quizzes using images from Practice Anatomy Lab. Use the checklist to select only those structures covered in your course.



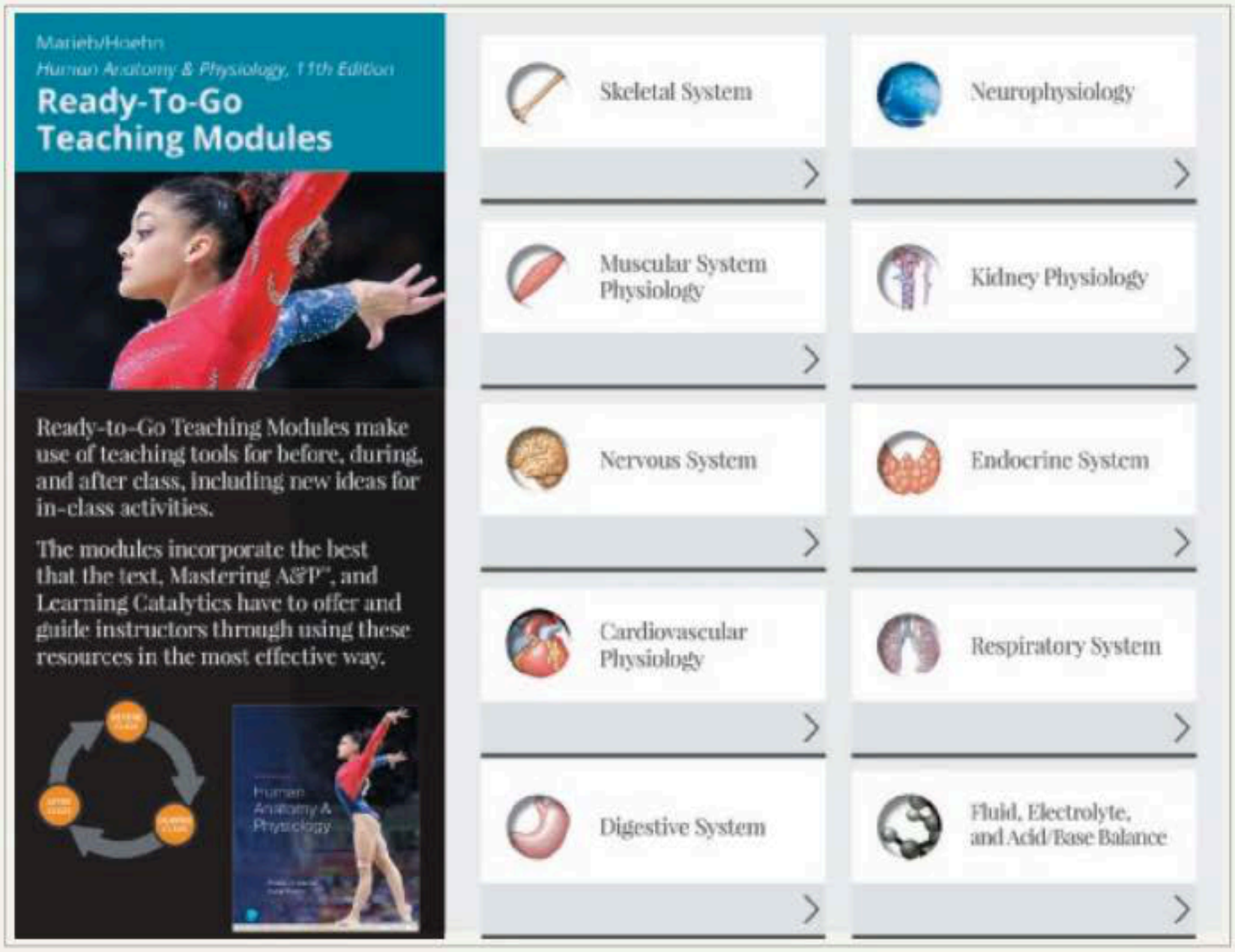




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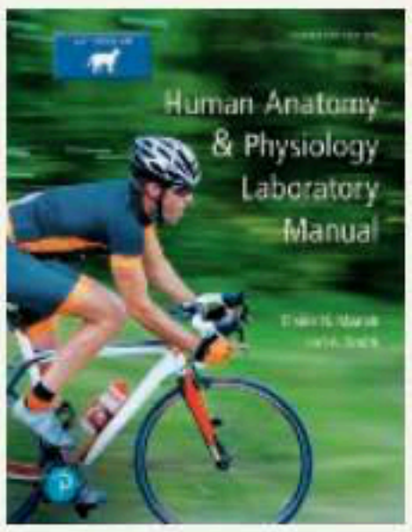
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- **NEW! Focus Figure "Mini-Animation" Coaching Activities** bring the 6 new Focus Figures to life and include assessment questions.
- **IMPROVED! Concept Map Coaching Activities** support the concept maps in the text without requiring students to submit their own concept map for grading.
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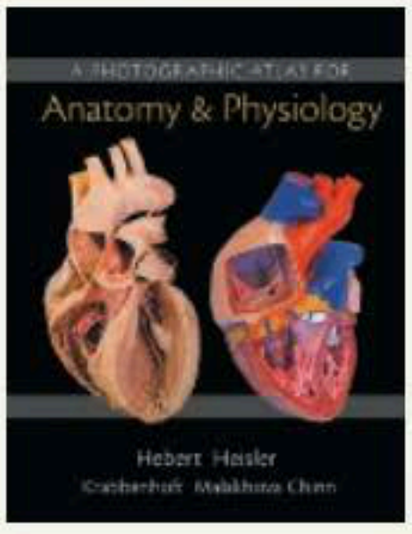
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