



Laboratory Manual for Human Anatomy & Physiology, 4e

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Global Changes

- Renumbering of many exercise figures.
- Safety guidelines moved to Appendices.
- Ph.I.L.S. 4.0 laboratory lessons moved to Appendices.
- Added APR icons.
- Replaced squares for histology drawings with circles to represent microscope field of view.

Chapter by Chapter Changes

LABORATORY EXERCISE	TOPIC	CHANGE
1	Pre-Lab	Added question
2	Pre-Lab Introductory material Procedure A (body cavities and membranes) Fig. 2.2a and 2.2b (thoracic membranes) Fig. 2.3 (serous membranes) Fig. 2.4 (other body cavities) Procedure C (positions, planes, regions) Fig. 2.6 (directional terms) Table 2.1 (directional terms meaning) Fig. 2.7 (planes) Fig. 2.9 (body surface regions) Fig. 2.11 (serous membranes of heart) Assessments: Part C Fig. 2.13b (body surface regions—posterior)	Added question Revised components and improved depth of membranes and other body cavities Improved depth Expanded labels Revised and improved labels New figure Improved depth Revised labels New table Revised label Added labels New figure Added questions New figure
3	Pre-Lab Procedure A (pH scale) Procedure B (slide preparation) Assessments: Part A	Added question Improved depth Revised components and step lettering Added question
4	Fig. 4.1 (microscope) Table 4.1 (microscope parts and their function) Assessments: Part C Assessments: Part E	Revised labels and expanded legend New table Added letter e Revised field of view circles for drawings
5	Materials Needed Introductory material Assessments: Part C	Suggestion for prepared slides Revised and improved depth of plasma membrane structure and transport

	Fig. 5.5 (cellular components)	Revised field of view circles for drawings; added question Revised components
6	Procedure B (osmosis) Procedure C (hyper-, hypo-, iso- tonic) Fig. 6.3 (apparatus for alternative activity) Procedure D (filtration) Assessments: Part D	Improved depth New Alternate Activity New drawing Improved depth Expanded Critical Thinking
7	Pre-Lab Introductory material Procedure (cell cycle) Fig. 7.2, 7.3, 7.4, 7.5 (cell cycle) Fig. 7.6 (onion root tip cells) Fig. 7.7 (human chromosomes) Assessments: Part B	Added questions Revised and improved depth Revised components; new Learning Extension Activity Revised legends and labels New figure Revised and improved legend Revised field of view circles for drawings
8	Pre-Lab Introductory material Procedure (epithelial tissues) Figure 8.1d and 8.1e Assessments: Part A Assessments: Part B and Part C	Added question Revised and improved depth of epithelial tissue characteristics Expanded directions Revised leader lines Revised field of view circles for drawings Added questions
9	Introductory material Procedure (connective tissues) Figure 9.1a (areolar connective tissue) Figure 9.1c (reticular connective tissue) and Figure 9.1k (blood) Figure 9.1f (elastic connective tissue) Table 9.1 (connective tissues and function) Table 9.3 (cells in connective tissues) Assessments: Part A Assessments: Part C	Expanded to include embryonic tissue Expanded directions Added label Updated labels Replaced micrograph and revised labels Expanded components New table Revised field of view circles for drawings Revised components and added question
10	Introductory material Figure 10.1c (cardiac muscle) Figure 10.2 (nervous tissue) Assessments: Part A Assessments: Part B	Improved depth for each muscle type Added label and revised leader lines Revised labels and leader lines Revised field of view circles for drawings Added question
11	Introductory material Procedure (integumentary system) Figure 11.5e (base of two hair structures) Assessments: Part A and Part E	Revised components Expanded components Replaced micrograph Revised and expanded components
12	Introductory material Procedure (bone structure and classification) Figure 12.3 (long bone structures) Figure 12.5 and Figure 12.11 (anatomy of bone) Figure 12.6b (spongy bone) and Figure 12.12 (compact bone) Assessments: Part A	Improved depth of function, matrix, cells Revised components and improved depth of cartilages and compact bone and long bone structures Expanded legend Revised and added leader lines and labels New figures Revised and expanded components
13	Pre-Lab Figure 13.2 (bone features)	Added questions Added labels
14	Pre-Lab Procedure (skull) Figure 14.1, 14.2, 14.4, 14.5, 14.11 (skull) Figure 14.3 (mandible) Figure 14.11 (lateral view of skull) Assessments: Part A and Part D	Added questions Revised and added components Added labels New figure Added term to label Added questions
15	Introductory material Procedure A (vertebral column) Figure 15.3 (articulation of atlas and axis) Figure 15.4 (vertebrae features) and Figure 15.5 (sacrum and coccyx) Assessments: Part B and Figure 15.10 Figure 15.11 (thoracic cage)	Improved clarity on axial skeleton Expanded components New figure Added labels Added question and new figure Added labels
16	Figure 16.8 (elbow) and Figure 16.9 (shoulder)	Added labels
17	Pre-Lab Introductory material Procedure A (pelvic girdle) and Procedure B (lower limb) Figure 17.2 (hip bone) and Figure 17.3 (femur) Figure 17.11 (coxal bone)	Added question Expanded components Added components Added labels New figure
19	Introductory material Figure 19.1 (joint classification)	Revised and expanded component on cartilaginous joints New figure
20	Introductory material	Improved depth on origin, insertion, action,

	Procedure (skeletal muscle) Figure 20.1 (skeletal muscle arrangement)	shape Expanded and added components Revised leader lines for endomysium
21	Figure 21.1 (student lab system setup) and Figure 21.2 (display window setup) Table 21.1 (display tools for analysis) and Figure 21.5 (dynamometers or pump bulb)	Replaced figures Revised and updated components
22	Pre-Lab Procedure (head and neck) Figure 22.1 (facial expression) Table 22.1 (facial expression), Table 22.2 (mastication), Table 22.3 (head and neck), Table 22.4 (hyoid and larynx) Figure 22.7 (anterior head) and Figure 22.8 (lateral head) Assessments: Part B Assessments: Part C	Added question Added muscles Added labels Expanded components; include innervation of muscles Added labels Added questions and updated numbering Added column for innervation and added question
23	Figure 23.2 (anterior chest, shoulder, arm) and Figure 23.3 (posterior chest, shoulder, arm) Table 23.1 (respiration), Table 23.2 (pectoral girdle), Table 23.3 (arm), Table 23.4 (forearm), table 23.5 (hand) Assessments: Part A and Part E Assessments: Part D	Added labels and revised components Expanded components; innervation of muscles Added questions Added column for innervation
24	Pre-Lab Table 24.1 (vertebral column), Table 24.2 (abdominal wall), Table 24.3 (pelvic floor) Figure 24.2 (abdominal wall)	Added question Expanded components; innervation of muscles Added labels
25	Figure 25.1 (hip and thigh) Procedure (hip and lower limb) Figure 25.3 (posterior hip and thigh) Figure 25.4 (deep hip) and Figure 25.7 (posterior right leg) Table 25.1 (thigh), Table 25.2 (leg), Table 25.3 (foot) Figure 25.5 (anterior thigh) Figure 25.10 (posterior hip and thigh) and Figure 25.11 (leg) Assessments: Part C Assessments: Part D	Revised (a) and added figure (b) Expanded components Revised and added labels Added labels Expanded components; innervation of muscles Replaced figure Added labels Added column for innervation Added question
26	Learning Outcomes Pre-Lab Figure 26.1 (posterior torso) and Figure 26.4 (lateral shoulder and upper limb), Figure 26.3b (anterior lower torso) Figure 26.2b (lateral head and neck), Figure 26.2c (posterior head and neck), Figure 26.3 (anterior torso), Figure 26.9 (anterior view) Assessments: Part C	Added Learning Outcome O4 Added question Replaced images and updated terminology Updated terminology Added question
27	Procedure A (nervous tissue), Figure 27.5 (ganglion and sensory neurons), Figure 27.9 (peripheral nerve) Assessments: Part C and Part D	Updated terminology Revised field of view circles for drawings
28	Introductory material and Procedure B (structure of spinal cord) Figure 28.1 (meninges of spinal cord), Figure 28.2 (cadaver cervical spinal cord), Figure 28.3 (spinal cord cross section), Figure 28.4 (spinal cord tracts), Figure 28.6 (transverse view spinal cord) Table 28.1 (nerve plexuses) Figure 28.7 (cervical plexus), Figure 28.11 (lumbar plexus), Figure 28.12 (sacral plexus), Figure 28.14 (micrograph spinal cord) Assessments: Part C and Part D	Updated terminology Updated and expanded components Expanded components Added labels Added questions
30	Procedure A: Cranial meninges Figure 30.4 (transverse section of brain) and Figure 30.6 (median section of brain) Table 30.1 (brain regions and functions)	Expanded components Added labels Expanded components
31B	Figure 31B.2 (electrode placement)	Revised component
32	Procedure (dissection of sheep brain) Figure 32.5 (median section sheep brain), Figure 32.7 (frontal section human brain), Figure 32.8 (median section sheep brain)	Expanded components to improve depth Revised and added labels
33	Learning Outcomes Pre-Lab Procedure B (tactile localization)	Revised Learning Outcome O2; added Learning Outcome O4 Added question

	Assessments: Part B (tactile localization) and Part C (two-point threshold) Assessments: Part D	Revised and replaced material Added table for organization and revised and added components Updated Learning Outcome connection
34	Figure 34.2 (small structures)	Revised label and leader lines
35	Procedure A (structure and function of eye) Figure 35.3 (eye structures) Procedure B (eye dissection) Figure 35.8 (cow eye dissection) and Figure 35.14 (cow eye dissection)	Expanded components and added depth Added label Expanded components New figures
37	Figure 37.11 (spiral organ structures)	Replaced micrograph and revised labeling
38	Figure 38.4 (dynamic equilibrium structures) Figure 38.6 (crista ampullaris)	Revised components Replaced micrograph and revised labeling
39	Learning Outcomes Introductory material Procedure (endocrine gland histology) Table 39.1 (endocrine hormones and functions) Figure 39.3 (anterior lobe), Figure 39.4 (posterior lobe), Figure 39.6 (thyroid gland), Figure 39.12 (pancreas) Figure 39.13 (ovary structure), Figure 39.14 (ovary), Figure 39.15 (testes structure) Assessments: Part A Assessments: Part B and Part C Assessments: Part D	Revised Learning Outcome O2 and added Learning Outcome O4 Revised and improved depth of relationship between hypothalamus-pituitary-thyroid Expanded and improved depth New table Replaced micrographs and revised labeling New figures and micrographs Revised field of view circles for drawings Revised components New assessment and questions
40	Figure 40.1 (normal stained pancreas) and Figure 40.4 (pancreas with diabetes mellitus) Assessment: Part C	Replaced micrographs and revised labeling Revised field of view circles for drawings
41	Pre-Lab and introductory material Table 41.1 (cellular components of blood) Assessment: Part C	Updated terminology Revised component Added question
42	Learning Outcomes Pre-Lab Introductory material Figure 42.1 (oxyhemoglobin dissociation) Assessments: Part A and Part B	Added new Learning Outcome O4 Added question Revised and improved depth New figure Added questions
43	Pre-Lab Introductory material Figure 43.2 (agglutination reaction)	Added question Improved depth Revised legend and label
44	Procedure A (human heart) and Procedure B (dissection of sheep heart)	Revised and expanded components
45	Pre-Lab Introductory material Table 45.1 (ECG components) and Figure 45.3 (ECG components) Assessments: Part C and Part E	Added question Revised components Expanded components Added questions
47	Introductory material Figure 47.2 (neurovascular bundle) Procedure C (arterial system) Figure 47.10a, 47.10c, 47.10d (arteries), 47.13 (thoracic wall veins), Figure 47.15a (veins) Procedure D (venous system) Assessments: Part A Assessments: Part D	Improved depth on characteristics of arteries and veins New figure and micrograph Added and expanded components New figures Added and expanded components Revised field of view circles for drawings Added question
49	Introductory material Figure 49.5 (lymphatic vessels, nodes, organs) Figure 49.11a (tonsils) Assessments: Part B Assessments: Part D	Improved depth on pharyngeal tonsils Revised figure New figure Revised field of view circles for drawings Added questions
50	Pre-Lab Introductory material Procedure A (respiratory organs) Figure 50.3 (larynx) and Figure 50.5 (lower respiratory system) Procedure B (respiratory tissues) Figure 50.9 (human lung tissue) Figure 50.10 (human lung tissue) Assessments: Part B	Added question Expanded components Added and expanded components Revised and added labels Expanded components Replaced micrograph and labels Revised label Revised field of view circles for drawings
51	Introductory material Table 51.1 (muscles of respiration) Assessments: Part C	Revised and improved depth on respiratory passages Revised for distinction Added question
52	Figure 52.1 (spirogram), Figure 52.2 (sample recording first calibration), Figure 52.3 (setup second calibration), Figure 52.5 (recording setup), Figure 52.6 (sample recording)	Replaced figures Revised and updated components

	spirometry), Figures 52.7–52.10 (proper selection areas) Procedure B (calibration) and Procedure C (recording)	
53	Pre-Lab Table 53.1 (muscles of respiration) Assessments: Part B	Added question Revised for distinction Added question
54	Procedure A (oral cavity and salivary glands) and Procedure D (pancreas and liver) Figure 54.1 (oral cavity) Assessment: Part A Assessments: Part D	Revised and added components Added labels Revised field of view circles for drawings Moved and added questions
55	Pre-Lab Introductory material Figure 55.1 (lock-and-key model) Figure 55.2 (amylase on starch digestion) Assessments: Part A	Added questions Revised and improved depth Revised to identify the key and the lock Revised legend Added question
56	Laboratory Exercise	New exercise
57	Procedure B (renal blood vessels and nephrons) Assessments: Part B and Part D Assessments: Part C	Revised and added components Revised field of view circles for drawings Added question
58	Pre-Lab Procedure A (physical and chemical analysis) and Procedure B (microscopic sediment analysis) Assessments: Part A	Added question Improved depth Expanded table to included column for abnormal simulated urine results
59	Introductory material Procedure A (male reproductive organs) Figure 59.1b (cadaver male reproductive) Assessments: Part A Assessments: Part B	Revised components Expanded components New figure Added question Revised field of view circles for drawings
60	Figure 60.1b (cadaver female reproductive) Procedure B (microscopic anatomy) Figure 60.6 (ovary) Assessments: Part B	New figure Improved depth on mature follicle Added labels and revised leader line Revised field of view circles for drawings
61	Introductory material Procedure A (meiosis and fertilization) Figure 61.3 (sea urchin stages) Assessments: Part A	Revised components and improved depth Expanded components New figure Revised field of view circles for drawings

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