Nervous System Part 1

Exercises 17, 21, and 22 (begins page 257 in 9th and 10th editions)

Lab 10 Objectives

Watch the spinal cord video to get oriented (no need to take notes)

For 9th and 10th editions:

Read lab Exercises 17, 21, and 22
For Exercise 17, do Activities 1 and 3 in class
For Exercise 21, do Activities 1, 3 and Dissection Part 3 in class
For Activity 5 as homework
For Exercise 22, do Activities 1 and 9 in class
do Activities 2 - 7 as homework

For 11th and 12th editions:

Read lab Exercises 15, 19, 20 and 21
For Exercise 15, do Activities 1 and 3 in class
For Exercise 19, do Activities 1, 3, and Dissection Part 3 in class
For Exercise 20, do Activity 2 as homework
For Exercise 21, do Activities 1 and 9 in class
do Activities 2-7 as homework

Exercise 17 Activities 1 & 3 in 9th and 10th editions
& Exercise 21 Dissection Activity Part 3 in 9th and 10th editions
Exercise 15 Activities 1 & 3 in 11th and 12th editions & Exercise 19 Dissection Activity Part 3 in 11th
and 12th editions
Identify histological features of nervous tissue slides

1. Large multipolar neuron
   - Cell body / soma
   - Nucleus
   - Nucleolus
   - Cell processes
   - Neurofibrils
   - Nissl bodies
   - Neuroglia / Glial cells

2. Neuromuscular junction
   - Axon terminal / synaptic terminal
   - Axon collateral
   - Muscle fiber

3. Peripheral nerve: teased myelinated axons
   (*A longitudinal section of nerve is on the same slide with the cross section but the
below listed features are easier to see on the teased neuron rather than sectioned
one)
   - Axon
   - Myelin
   - Endoneurium
   - Node of Ranvier / Myelin sheath gap
4. Peripheral nerve cross section
   - Axon
   - Myelin
   - Endoneurium
   - Perineurium
   - Fascicle

5. Spinal cord
   - Posterior median sulcus
   - Anterior median fissure
   - Dorsal / Posterior horn
   - Ventral / Anterior horn
   - Anterior funiculus / column
   - Lateral funiculus / column
   - Posterior funiculus / column
   - Gray commissure
   - Central canal

Exercise 21 Activity 1 in 9th and 10th editions
Exercise 19 Activity 1 in 11th and 12th editions
Identify spinal cord features on charts, models, and diagrams

<table>
<thead>
<tr>
<th>Posterior median sulcus</th>
<th>Anterior median fissure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dorsal / Posterior horn</td>
<td>Ventral / Anterior horn</td>
</tr>
<tr>
<td>Anterior funiculus / column</td>
<td>Lateral funiculus / column</td>
</tr>
<tr>
<td>Posterior funiculus / column</td>
<td>Gray commissure</td>
</tr>
<tr>
<td>Central canal</td>
<td>Ventral root</td>
</tr>
<tr>
<td>Dorsal root</td>
<td>Dorsal root ganglion</td>
</tr>
<tr>
<td>Spinal nerve</td>
<td>Dura mater</td>
</tr>
<tr>
<td>Arachnoid mater</td>
<td>Pia mater</td>
</tr>
</tbody>
</table>

Exercise 21 Activity 3 in 9th and 10th editions
Exercise 19 Activity 3 in 11th and 12th editions
Identify spinal roots, nerve plexus and peripheral nerves on charts, models, & diagrams

<table>
<thead>
<tr>
<th>Phrenic nerve</th>
<th>Axillary nerve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radial nerve</td>
<td>Median nerve</td>
</tr>
<tr>
<td>Musculocutaneous nerve</td>
<td>Ulnar nerve</td>
</tr>
<tr>
<td>Femoral nerve</td>
<td>Sciatic nerve</td>
</tr>
</tbody>
</table>

For each of the eight major peripheral nerves listed above know:
- Name
- Location
- Spinal roots
- Nerve plexus
- Function

(See chart on next page)
This chart should be considered the minimum detail to know for each nerve:

<table>
<thead>
<tr>
<th>Plexus</th>
<th>Nerve</th>
<th>Spinal Roots</th>
<th>Service/Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical plexus</td>
<td>Phrenic nerve</td>
<td>C3-C5</td>
<td>Motor to diaphragm</td>
</tr>
<tr>
<td>Brachial plexus</td>
<td>Axillary nerve</td>
<td>C5-C6</td>
<td>Sensory and motor to shoulder</td>
</tr>
<tr>
<td>Brachial plexus</td>
<td>Radial nerve</td>
<td>C5-C8, T1</td>
<td>Sensory and motor to posterolateral surface of arm, forearm, and hand</td>
</tr>
<tr>
<td>Brachial plexus</td>
<td>Median nerve</td>
<td>C5-C8, T1</td>
<td>Sensory and motor to anteromedial surface of forearm and lateral 2/3 of hand</td>
</tr>
<tr>
<td>Brachial plexus</td>
<td>Musculocutaneous nerve</td>
<td>C5-C7</td>
<td>Sensory and motor to anterolateral forearm</td>
</tr>
<tr>
<td>Brachial plexus</td>
<td>Ulnar nerve</td>
<td>C8, T1</td>
<td>Sensory and motor to posteromedial forearm and medial 1/3 of hand</td>
</tr>
<tr>
<td>Lumbar plexus</td>
<td>Femoral nerve</td>
<td>L2-L4</td>
<td>Motor to anterior thigh, Sensory to anteromedial surface of leg and thigh</td>
</tr>
<tr>
<td>Sacral plexus</td>
<td>Sciatic nerve</td>
<td>L4, L5, S1-S3</td>
<td>Sensory and motor to anterior and posterior of thigh, leg, and foot</td>
</tr>
</tbody>
</table>

Exercise 22 in 9th and 10th editions
Exercise 21 in 11th and 12th editions
Identify features and characteristics of reflex arcs from diagrams and models
Reflex Arc
   Monosynaptic vs Polysynaptic reflex arc
   Receptor
   Sensory neuron
   Integration center
   Motor neuron
   Effector

Exercise 22 Activities 1 and 9 in 9th and 10th editions in class, Activities 2 - 7 in 9th and 10th editions as homework
Exercise 21 Activities 1 and 9 in 11th and 12th editions in class, Activities 2 - 7 in 11th and 12th editions as homework
Test your reflexes with a partner. Answer the Activity questions to analyze the results.
   1. Patellar stretch reflex (Activity 1 in class)
   2. Basic/Intrinsic and Acquired/Learned reflexes (Activity 9 in class)
   3. Crossed extensor reflex
   4. Plantar reflex
   5. Corneal reflex
   6. Gag reflex
   7. Pupillary reflexes
   8. Ciliospinal reflex
Exercise 21 Activity 5 in 9th and 10th editions: Homework
Exercise 20 Activity 2 in 11th and 12th editions: Homework

Know the effect of sympathetic and parasympathetic autonomic nervous system divisions on selected organs: heart, bronchioles, digestive tract, urinary bladder, iris, blood vessels, erectile tissues, sweat glands, adrenal medulla, and pancreas

Optional Computer Activity:
PhysioEx Exercise 18B (On the PhysioEx CD-ROM packaged with the lab book)
  pages PEx-37 to PEx-48 (back of the book) in 9th and 10th editions
PhysioEx Exercise 3 pages PEx-35 to PEx-58 in 11th and 12th editions

For Study:
  Review Sheet Exercise 17 pages 265-268 in 9th and 10th editions
  Review Sheet Exercise 15 pages 261-264 in 11th edition
  Review Sheet Exercise 21 pages 337-340 in 9th edition
  Review Sheet Exercise 19 pages 319-321 in 11th edition
  Review Sheet Exercise 22 pages 351-354 in 9th edition
  Review Sheet Exercise 21 pages 345-347 in 11th edition

Answers in the Instructors Manual at the Eastern Campus Library on reserve