THE FUNDAMENTALS OF BODY DESIGN

2004-2005

(The Gross Anatomy Component of the Fundamentals of Human Biology)

A. Timetable

Lectures are held in the LSC Lecture Theater; dissection classes are held in the Gross Anatomy Laboratories in the Friedman Building.

Sept. 3 Introduction	10:00 - 12:00	LSC Lecture Theatre	Development of Body Form: Zygote to Embryo *Crawford*
	1:00 - 2:00	LSC Lecture Theatre	Introduction to Gross Anatomy: Superficial Muscles of Back, Bones & Joints. *Vogl/Doroudi*
	2:00 - 5:00	Gross Laboratories	Orientation to Gross Anatomy Laboratory & Dissection of Back. *Vogl/Doroudi*
Sept. 10 Week 1	1:00 - 2:00	LSC Lecture Theatre	Introduction to the Nervous System: A Segmented System: Spinal Nerves.*Vogl*
	2:00 - 5:00	Gross Laboratories	Deep Dissection of Back & Spinal Cord. *Vogl*
Sept. 17 Week 2	1:00 - 2:00	LSC Lecture Theatre	The Thorax (1): General Organization of the Thoracic Walls, Pleural Cavities & Lungs. *Church*
	2:00 - 3:00	LSC Lecture Theatre	Introduction to Radiological anatomy. *Crawford*
	3:00 - 5:00	Gross Laboratories	Dissection of the Thoracic Walls, Pleural Cavities and Lungs *Church*
Sept. 24 Week 3	1:00 - 2:00	LSC Lecture Theatre	The Thorax (2): Middle Mediastinum & Heart. *Crawford*
	2:00 - 3:00	LSC Lecture Theatre	Radiological Anatomy of the Thorax. *Crawford*
	3:00 - 5:00	Gross Laboratories	Dissection of the Middle Mediastinum & Heart. *Crawford*
Oct. 1 Week 4	1:00 - 2:00	LSC Lecture Theatre	The Thorax (3): Superior & Posterior Regions of the Mediastinum. *Church*
	2:00 - 5:00	Gross Laboratories	Dissection of Superior & Posterior Regions of the Mediastinum. *Church*
Oct. 8 Week 5	1:00 - 2:00	LSC Lecture Theatre	The Abdomen (1): Anterior Abdominal Wall & Inguinal Region. *Church*
	2:00 - 5:00	Gross Laboratories	Dissection of Anterior Abdominal Wall & Inguinal Region. *Church*
Oct. 15 Week 6	1:00 - 2:00	LSC Lecture Theatre	The Abdomen (2): General Organization of the Peritoneum & Viscera. *Church*
	2:00 - 3:00	LSC Lecture Theatre	The Visceral Nervous System. *Vogl*
	3:00 - 3:30	Gross Laboratories	Demonstration of Autonomic Nervous System. *Vogl*
	3:30 - 5:00	Gross Laboratories	Exploration of Abdominal Cavity. *Church*
Oct. 22 Week 7	1:00 - 2:00	LSC Lecture Theatre	Gross Anatomy of the Abdomen (3): Foregut Organs & Vessels. *Doroudi*
	2:00 - 5:00	Gross Laboratories	Dissection of Foregut Organs & Vessels. *Doroudi*
Oct. 29 Week 8	1:00 - 2:00	LSC Lecture Theatre	Gross Anatomy of the Abdomen (4): Midgut & Hindgut Organs & Vessels & Posterior Abdominal wall. *Doroudi*

	2:00 - 5:00	Gross Laboratories	Dissection of Midgut & Hindgut Organs & Vessels. *Doroudi*
Nov. 5	1:00 - 2:00	LSC Lecture Theatre	The Pelvis: Walls and Viscera. *Krebs*
Week 9	2:00 - 5:00	Gross Laboratories	Demonstration of Pelvic Walls and Viscera; Exploration of Pelvic Viscera. *Krebs*
Nov. 12	1:00 - 2:00	LSC Lecture Theatre	The Perineum: Boundaries and Contents. Krebs
Week 10	2:00 - 3:00	Gross Laboratories	Demonstration on Prosections of the Boundaries and contents of the Perineum. *Krebs*
Nov. 19	1:00 - 2:00	LSC Lecture Theatre	The Head and Neck (1): Basic Design and Introduction to the Cranial Nerves. *Vogl*
Week 11	2:00 - 5:00	Gross Laboratories	Dissection of Cranial Cavity, Dura and Identification of Cranial Nerves. *Vogl*
Nov. 26	1:00 - 2:00	LSC Lecture Theatre	The Head and Neck (2): Cranial Nerves V and VII. Week 12 *Vogl*
	2:00 - 5:00	Gross Laboratories	Dissection of Face and Identification of Terminal Branches of V and VII. *Vogl*
Dec. 3	1:00 - 2:00	LSC Lecture Theatre	The Head and Neck (3): Organization of the Neck: The Anterior Triangle.*Vogl*
Week 13	2:00 - 3:00	Gross Laboratories	Dissection of the Anterior Triangle. *Vogl*
Dec. 10	1:00 - 2:00	LSC Lecture Theatre	The Head and Neck (4): The Airway and Digestive Tract. *Vogl*
Week 14	2:00 - 5:00	Gross Laboratories	Dissection of the Pharynx and Identification of the Choanae, Oropharyngeal Isthmus and Superior Aperture of the Larynx. *Vogl*

B. Overview and General Learning Objectives

P2P1 contains a gross anatomy component termed "The Fundamentals of Body Design". This component has at least one lecture and laboratory scheduled each week and involves a detailed dissection of the vertebral canal and body core regions (thorax, abdomen and pelvis). P2P1 also contains introductory sessions on the somatic and autonomic nervous systems, embryology, radiological anatomy, head and neck anatomy, cranial nerves and bones/joints.

Although the gross anatomy sessions in "The Fundamentals of Body Design" encompass many of the guiding principles of P2P1, they are NOT necessarily integrated with the themes of each week in P2P1. Rather, the gross anatomy sessions in P2P1 together constitute a longitudinal lecture and laboratory dissection course that will provide students with an understanding of the normal gross anatomical structure of the core regions of the body. As such, the material presented in "The Fundamentals of Body Design" is key to many of the other activities that students undertake in P2P1 and P2P2, including case-based learning sessions and family practice visits. Information provided in "The Fundamentals of Body Design" which is of direct relevance to the Pulmonary, Cardiovascular, FERGU, Reproduction Growth & Development and Gastrointestinal Systems Blocks will be reviewed briefly in each of the relevant Blocks in P2P2. Material not covered in "The Fundamentals of Body Design" (gross anatomy of the upper and lower limbs, detailed anatomy of the head and neck) is integrated respectively into the Musculoskeletal and Brain & Behaviour Blocks in P2P2 as lectures and dissection laboratories.

The "Fundamentals of Body Design" component will meet the following general learning objectives:

a) It will enable students to develop a vocabulary of terminology and a network of anatomical concepts that are fundamental to the body as a whole. Students will use general anatomical terminology to describe a body region and structures within a body region.

b) Students will be able to describe the major events in the development of and major characteristic features of the general vertebrate body plan.

c) Students will be provided with an understanding of the normal gross anatomy of the core regions of the body (thorax, abdomen and pelvis) and their major organ systems (respiratory, cardiovascular, gastrointestinal and genitourinary), and an introduction to the anatomy of the head and neck. This understanding forms the basis for performing competent physical examinations and invasive procedures, demonstrating normal and abnormal physical signs, and interpreting image data that reveal internal structures.

d) In relation to the nervous system, students will be able to define the terms central, peripheral, somatic, visceral and autonomic and will be able to identify the major component parts of a spinal nerve and of the autonomic nervous system.

C. Specific Learning Objectives for P2P1:

These are listed below for each week of the course.

Sept. 3.
Introduction

A. Development of Body Form: Zygote to Embryo
Dr. Crawford

This lecture will provide an overview of early human development, beginning at fertilization:

- fertilization
- cleavage
- gastrulation and the formation of the primary germ layers
- neurulation
- development of somites and coeloms
- pattern of folding that leads to the development of the basic adult vertebrate body plan

B. Introduction to Gross Anatomy: Superficial Muscles of the Back
Dr. Doroudi & Dr. Vogl

In preparation for the deep dissection of the vertebral canal, identify on dissections and describe the general attachments of the following muscles:

- Trapezius
- Latissimus dorsi
- Rhomboideus major and minor
- Levator scapulae
- Erector spinae (as a group - you do not need to learn individual components)

Be able to identify:

Bones

Scapula
- Spine
- Acromion
- Superior, inferior and lateral angles
- Superior, lateral and medial borders

Typical Vertebra
- body
- pedicle
- lamina

- spinous process
- transverse process
- superior and inferior articular processes
- superior and inferior vertebral notches
- vertebral foramen
- intervertebral foramen

Vertebral column (regions) and curvatures

Intervertebral disc
- nucleus pulposus
- annulus fibrosus

Cervical vertebrae
- atlas
- axis
- seventh cerrcical vertebra
  - vertebral prominence
- typical cervical vertebra
  - foramen transversarium

Thoracic vertebrae
- articular facets for ribs

Lumbar vertebrae

Sacrum

Accessory nerve (cranial nerve XI)

Sept. 10. Week 1.

Introduction to the Nervous System. *Dr. Vogl*

A. A Segmented System: Spinal Nerves
B. Deep Dissection of the Back and Spinal Cord

Be able to:

- describe the embryological basis for the segmental organization of the nervous system.
- indicate the two major subdivisions of the nervous system (peripheral and central)
- indicate the two major classes of nerve fibers (somatic, visceral) and the general functions of each
- describe a simple somatic reflex arc
- define a peripheral ganglion
- indicate the vertebral regions of the body and describe how spinal nerves are numbered from C1 to Co (coccygeal) in relation to vertebrae
- define, both from an embryological perspective and in the adult (as used clinically):
  - a dermatome
  - a myotome

Be able to describe and identify the major components of a spinal nerve:

- dorsal and ventral roots
- dorsal root ganglion
- spinal nerve
- dorsal and ventral rami

be able to indicate the sensory and/or motor components contained in each of the above listed structures

Be able to identify:

- A typical vertebra
  - Body
  - Pedicles
  - Laminae
  - Spinous process
  - Superior and inferior articular processes
  - Superior and inferior vertebral notches
  - Vertebral foramen

a) Positions of intervertebral discs

b) An intervertebral foramen (describe borders and contents)

Be able to identify:

- spinal dura, arachnoid and pia
- subarachnoid space and the epidural space

c) cauda equina and filum terminale

Be able to indicate, in children and in adults, at which vertebral level the spinal cord terminates and at which vertebral level the subarachnoid space terminates

Clinical Correlates:

- epidural space
- lumbar puncture
- disc protrusion

Weeks 2 - 4. The Thorax

Sept. 17. Week 2.

General Organization of Thoracic Walls, Pleural Cavities & Lungs
Dr. Church

The objective is to study the gross anatomical features of the thoracic walls, pleural cavities and lungs. Subsequent lectures and laboratories will examine in greater detail the anatomy of the other regions of the thorax and their contents.

Be able to identify and describe orally and in writing the boundaries and major anatomical divisions of the thoracic cavity, together with their contents.

a) Osteology and surface anatomy

Be able to identify:

- A typical thoracic vertebra (N.B. articular facets for the ribs)
- A typical true rib, *i.e.* not the 1st rib (head with articular facets, neck, tubercle with articular facet, angle, shaft, costal groove)
- Sternum:
  - Manubrium (suprasternal notch, facets for articulation of clavicle and 1st and 2nd ribs)
  - Sternal angle (angle of Louis)
  - Body of sternum (facets for articulation of ribs 2 - 7)
  - Xiphoid process
- Costal cartilages
- Intercostal spaces

Be able to describe:

- the boundaries of the thoracic inlet and thoracic outlet (suprapleural membrane and costal margin)
- the anatomical and clinical importance of the horizontal plane joining the sternal angle with the T4/5 intervertebral disc
- the surface projections of the lungs and their fissures and lobes
- the surface projections of the pleural cavities
- how to identify, on a patient, the second rib
- the articulation of a true rib with two adjacent thoracic vertebrae
- the contents of an intercostal space
- the position and numbering of a spinal segmental (intercostal) nerve relative to two thoracic vertebrae and an articulating rib

b) Muscles

Be able to identify:

- Intercostal muscles
- Diaphragm and its central tendon

Be able to describe:

- the origin of the diaphragm
- the muscles involved in normal quiet respiration and those involved in forced inspiration and expiration

c) Arteries and veins

Be able to identify: - Anterior and posterior intercostal arteries and veins
- Internal thoracic (mammary) arteries and veins

Be aware of the importance of the venous and lymphatic drainage of the breast

d) Nerves

Be able to identify: - Intercostal nerves

Be able to describe the course of an intercostal neurovascular bundle and the importance of this for intercostal nerve block and insertion of chest drains

Why can pathology in the chest present as pain in the abdomen?

e) Suprapleural membrane

Be aware of the clinical importance of the pleural cavities rising above the level of the first rib

f) Pleural cavities

Be able to identify:
- visceral and parietal pleura
- costophrenic angle and costodiaphragmatic recess

Be able to describe:
- the various divisions of the pleura
- the surface projections of the pleural cavities
- the clinical importance of the costodiaphragmatic recess
- the clinical importance of the division between visceral & parietal pleura

g) Mediastinum

Be able to identify:
- Anterior mediastinum: thymus gland, internal thoracic vessels, lymph glands

Be able to describe:
- the anatomical divisions of the mediastinum and their major contents (see below)
- the clinically important relationships of the lungs and pleurae to mediastinal structures

Be able to identify and describe orally and in writing the gross anatomy of the lungs and lower respiratory tree.

a) Trachea

Be able to describe the anatomical relationships of the trachea in the neck and thorax

Be able to identify the bifurcation of the trachea and the vertebral level at which this occurs

b) Primary and secondary bronchi

Be able to describe:

- the clinical importance of the different size and course of the L. and R. primary bronchi
- which structures constitute the conducting portion of the respiratory system

Be able to define and describe the general anatomical features of a bronchopulmonary segment

c) Lungs

Be able to identify:

- Hilus (root)
- Fissures (oblique, horizontal/transverse)
- Lobes (upper, middle and lower on R.; upper and lower on L.)
- Lingula (on L. only)

Be able to list the structures which pass to or from a lung via the hilus or root of the lung (pulmonary A. and V., primary bronchus, bronchial As.)

Be able to describe the surface projections of the lungs

Be able to indicate the anatomical relationships that are important for performing a chest examination

d) Be able to describe the pulmonary vasculature and the pathway it follows to and from the areas of gas exchange

B. Introduction to Radiological Anatomy
Dr. Crawford

This lecture will introduce some of the basic principles of radiology. It will describe:

- how a radiograph is generated
- how different materials affect X-rays
- the different radiographic densities:
  - bone
  - water
  - fat
  - air
- how materials of different densities combine to form the shadows found on a radiograph

Sept. 24. Week 3.

A. Middle Mediastinum & Heart
Dr. Crawford

Be able to identify and describe orally and in writing the gross anatomy of the pericardium, pericardial cavity and surface structures of the heart:

Be able to identify:

a) The pericardial sac:

Be able to distinguish between:

- the fibrous pericardium
- the parietal serous pericardium (serous pericardium)
- the visceral serous pericardium (the epicardium)

b) The following cardiac surface markings:

- the base of the heart
- the apex
- the atrioventricular groove
- the posterior interventricular groove
- the anterior interventricular groove

c) The borders of the following cardiac chambers on the external cardiac surface:

- the right atrium and right atrial appendage
- the right ventricle
- the left atrium and left atrial appendage
- the left ventricle

d) The following coronary vessels:

- right coronary artery
  - posterior descending branch
- left coronary artery
  - circumflex branch
  - anterior interventricular branch (often called the left anterior descending or LAD)
- coronary sinus

e) Be able to describe:

- The surface projections of the heart and pericardium
- In a radiograph, the chambers which form the borders of the cardiac silhouette in P.-A. and lateral projections
- The anatomical relationships of the heart to other structures in the thorax

Be able to identify the following internal cardiac structures:

a) Within the right atrium:

- the right atrial appendage and musculi pectini
- the opening for the tricuspid valve (the R. atrio-ventricular orifice)
- the opening of the superior vena cava

- the opening of the inferior vena cava
- the opening of the coronary sinus
- the interatrial septum
- the fossa ovalis

b) Within the right ventricle:
- the cusps of the tricuspid valve (you do NOT need to know the names of the individual cusps)
- chordae tendinae
- trabeculae carnae
- the interventricular septum
- papillary muscles
- the septomarginal trabeculum (moderator band)
- the pulmonary outflow tract
- the pulmonary valve with its cusps (you do NOT need to know the names of the individual cusps)

c) Within the left atrium:
- the interatrial septum
- the left atrial appendage (rough- and smooth-walled portions)
- the openings for the pulmonary veins
- the opening for the mitral valve (the L. atrio-ventricular orifice)

d) Within the left ventricle:
- the leaflets of the mitral valve (you do NOT need to know the names of the individual cusps)
- chordae tendinae
- papillary muscles
- trabeculae carnae
- the cusps of the aortic valve (you do NOT need to know the names of the individual cusps)

e) Within the ascending aorta:
- the ostia for the right and left coronary arteries

f) Be able to describe:
- the position of the coronary ostia and arrangement and major branches of the coronary arteries
- the structure and characteristic features of each of the four cardiac chambers
- the overall structure of the tricuspid, mitral, aortic and pulmonary valves (individual cusps need not be named)
- the pattern of blood flow through the heart with regard to the arrangement of the cardiac chambers and their valves

d) the relationship between the aorta and pulmonary trunk

B. Radiological Anatomy of the Thorax

Dr. Crawford

A separate detailed handout will be provided at the beginning of the lecture

At the end of this session, the student will be able to demonstrate the application of basic anatomical knowledge to the interpretation of imaging studies of the thorax. The student should be able to:

- differentiate between P.-A. and lateral projections
- counts ribs on a P.-A. projection
- identify all of the structures listed in the keys to figures provided in the detailed handout

Oct. 1. Week 4.

Superior and Posterior Mediastinum
Dr. Church

Be able to identify and describe orally and in writing the gross anatomy of the superior and posterior regions of the mediastinum and understand the anatomical relationships between the listed structures.

Be able to identify and describe the course of:

a) Azygous system of veins
- be able to identify azygous and hemiazygous Vs. and the arch of the azygous V.
- be able to describe the importance of the anastomosis between the portal and systemic venous systems which is found in the lower part of the oesophagus

b) Thoracic duct

c) Oesophagus

Be able to describe:
- the course and anatomical relationships of the oesophagus in the thorax and the diagnostic importance of the relationship of the oesophagus with the arch of the aorta, the left primary (main) bronchus and the left atrium
- the indentations normally seen in the oesophagus on barium swallow

d) Trachea and it's bifurcation into L. and R. primary (main) bronchi

e) Pulmonary trunk and L. and R. pulmonary arteries

f) Aorta

ascending, arch and descending. Be able to name and identify the major branches arising from each part of the thoracic aorta: coronary As.; brachiocephalic A.; L. common carotid; L. subclavian A.; posterior intercostal As.

g) Great veins of the thorax: L. & R. subclavian and internal jugular Vs.; L. & R. brachiocephalic Vs.; superior and inferior vena cavae. Be able to describe the importance of the R. subclavian V. for central venous cannulation

h) L. & R. vagus nerves and recurrent laryngeal nerves

Be able to describe:

- the origin, course, distribution and function of the vagus Ns. in the neck and thorax
- the importance of the intrathoracic course of the L. recurrent laryngeal N. Why can pathology in the thorax present as a change in voice?

i) Ductus arteriosus/Ligamentum arteriosum

j) Sympathetic trunk

Rami communicantes, dorsal root ganglion, splanchnic Ns.

k) L. and R. phrenic Ns. Be able to describe:

- the origin, course and function of the phrenic Ns.
- the clinical importance of the cervical origin of the phrenic Ns.

l) Be able to describe:

- the course and major relationships of the great vessels entering and leaving the heart
- the vertebral levels at which the inferior vena cava, oesophagus, descending thoracic aorta and thoracic lymph duct pierce the diaphragm to enter or leave the thoracic cavity

Weeks 5 - 8: The Abdomen

CONCEPTUAL OVERVIEW:

a) Body cavity lying below the thorax, its walls, roof, floor and viscera lined by serous endothelium - the peritoneum.
b) Attachments of walls and floors defined by vertebral column, ribs and bony pelvis.
c) Encloses the largest part of the gastrointestinal tract, its major glands, blood vessels, lymphatics, kidneys, suprarenal glands, and major parts of the peripheral nervous system.
d) The abdominal cavity is continuous below with the pelvic cavity (which contains the terminal portions of the gastrointestinal tract, the urinary system, and reproductive organs). The pelvic brim (or inlet) is defined as the lower limit of the abdominal cavity.

Oct. 8. Week 5.

Anterior Abdominal Wall & Inguinal Region
Dr. Church

The lecture and the accompanying laboratory will together provide an overview of the anatomy of the anterior abdominal wall and the inguinal regions, with a particular emphasis on hernias.

a) Surface Anatomy

Be able to identify the following surface landmarks:
- costal margin, xiphisternum
- iliac crest, anterior superior iliac spines
- pubic tubercle, pubic crest
- inguinal ligament

Be able to describe:
- subcostal & transtubercular planes, midclavicular line
- the regions of the abdomen employed for ease of description (*i.e.* the anatomical divisions of the abdomen)
- normal surface location of the appendix
- dermatomes of the anterior abdominal wall

b) Anterior Abdominal Wall

Be able to identify:

Fascia
- Superficial fascia
- Deep fascia - Rectus sheath
- Fascia transversalis
- Linea alba

Extraperitoneal fat

Peritoneum

Muscles
- External oblique

- Internal oblique
- Transversus abdominis
- Rectus abdominis

Inguinal region
- Inguinal ligament
- Superficial inguinal ring
- Inguinal canal and its contents in males and females
- Conjoint tendon
- Position of deep inguinal ring

In the Male - Identify the spermatic cord in relation to the inguinal rings and inguinal canal

In the Female - Identify the round ligament of the uterus as it exits the superficial inguinal ring. Understand that the female has an inguinal canal and that it contains, as does the male, remnants of the processus vaginalis

Arteries: Superior and Inferior epigastric

Nerves: L_1
- Iliohypogastric
- Ilioinguinal

Be able to define:

Hernia

Be able to describe:

- cutaneous innervation of the anterior abdominal wall
- innervation of abdominal musculature
- the functional roles of the anterior abdominal musculature
- the positions of the deep and superficial inguinal rings
- direct and indirect inguinal hernias
- other common sites of herniation involving the abdominal contents

Oct. 15. Week 6.

A. General Organization of Peritoneum and Viscera
Dr. Church

The lecture and the accompanying laboratory will together provide an overview of the general disposition of the peritoneum and abdominal contents. You should not dissect any of the intra-abdominal structures during the laboratory. Rather, you should take time to explore the general disposition of the abdominal viscera and the peritoneum.

N.B. DO NOT REMOVE VISCERA FROM ABDOMINAL CAVITY

a) Be able to identify:

The major abdominal viscera
- distal end of the oesophagus
- stomach
  - cardia
  - fundus
  - body
  - greater and lesser curvatures
  - antrum
  - pylorus
- duodenum
  - four portions
  - greater papilla
- small bowel
  - jejunum
  - ileum
- ileocaecal junction
- appendix
- ascending, transverse, descending and sigmoid portions of large bowel
- liver and gall bladder
  - hilum
  - lobes
  - bile ducts
  - central veins from portal system
- spleen
- pancreas
- kidneys and upper urinary tract
- suprarenal glands

Mesenteries and ligaments. Starting with the oesophagus, trace all components of the GI system to the rectum and identify which are intraperitoneal

(suspended by a mesentery) and which are retroperitoneal (attached to the posterior abdominal wall).

Dorsal mesentery	- Greater omentum - The mesentery (of small intestine) - Transverse mesocolon - Sigmoid mesocolon
Ventral mesentery	- Falciform ligament (containing the ligamentum teres) - Lesser omentum - Hepatoduodenal ligament and its contents (hepatic portal vein, hepatic artery, common bile duct)
Greater peritoneal sac	
Lesser peritoneal sac (omental bursa)	- Epiploic foramen of Winslow (gastroepiploic foramen)

b) Be able to describe:
- the general arrangement of the peritoneum, peritoneal reflections and peritoneal recesses
- the arrangement of the mesenteries and omenta
- the relationships of the major abdominal viscera to each other
- the relationships of the major abdominal viscera to the peritoneum (*i.e.* is the organ intraperitoneal (suspended by mesentery) or is it retroperitoneal (attached to the posterior abdominal wall)).

B. The Visceral Nervous System
Dr. Vogl

Be able to describe and/or define:
- the basic arrangement of visceral motor and visceral sensory pathways as they relate to a typical spinal nerve and to the spinal cord
- the term “autonomic nervous system”
- the terms Sympathetic and Parasympathetic and indicate with which regions of the central nervous system these elements are associated
- the anatomical and functional features that characterize the visceral motor component of the nervous system
- what is meant by paravertebral and prevertebral autonomic systems?
- the major positions of autonomic ganglia in the body
- the general pathways by which autonomics are distributed to the periphery and viscera
- the regions of the central nervous system that retain visceral motor outflow

Be able to identify on prosections:

- sympathetic trunk
  - thoracic, lumbar and sacral ganglia
  - superior, middle and inferior cervical ganglia
  - white and gray rami communicantes
- vagus nerve (cranial nerve X)
- splanchnic nerves (greater)
- prevertebral plexus and associated ganglia

Oct. 22. Week 7.

A separate detailed handout will be provided at the beginning of the lecture.

Foregut Organs & Vessels
Dr. Doroudi

N.B. DO NOT REMOVE VISCERA FROM ABDOMINAL CAVITY

Stomach, Duodenum, Pancreas, Liver, Biliary Passages, Portal Vein, Coeliac Trunk and Mesenteric Vessels:

a) Be able to identify:

Stomach
- cardia
- fundus
- body
- greater and lesser curvatures
- antrum
- pylorus

Duodenum
- First part
- Second part
  - Common opening of bile duct and major pancreatic duct
  - Duodenal papilla
- Third part
- Fourth part

Pancreas
- Head
- Neck
- Body
- Tail

Spleen

Liver
- Left lobe
- Right lobe
- Caudate lobe
- Quadrate lobe
- Hepatic veins
- Hepatic portal vein

Biliary Tree
- Right and left hepatic ducts
- Common hepatic duct
- Gallbladder
- Cystic duct
- Bile duct (common)

Arteries
- Abdominal Aorta
  - Coeliac Trunk - Left Gastric

- Common Hepatic
  - Gastroduodenal
    - R. gastroepiploic
  - R. gastric
  - Hepatic Proper
    - R. hepatic
      - Cystic
    - L. hepatic
- Splenic
  - Short gastric
  - Left gastroepiploic

Superior mesenteric
- Ileocolic
  - Appendicular
- Right colic
- Middle colic
- Marginal

Veins

Inferior vena cava
- Superior mesenteric
- Splenic
- Hepatic portal vein
  - Porta hepatis

Nerves

Autonomic innervation of the foregut organs

Lymphatics

- Lymphatic drainage of the foregut organs
- Cisterna chyli

b) Be able to describe:

- Relationship of pancreas to duodenum and to major blood vessels (veins and arteries)
- Sympathetic and parasympathetic input to the prevertebral plexus and the route the fibers take to the viscera. What is the significance of the left colic flexure with respect to parasympathetic innervation?

Oct. 29. Week 8.

A separate detailed handout will be provided at the beginning of the lecture.

Midgut & Hindgut Organs and Vessels & Posterior Abdominal Wall
Dr. Doroudi

N.B. DO NOT REMOVE VISCERA FROM ABDOMINAL CAVITY

Midgut & Hindgut Organs and Vessels:

Be able to identify:

Viscera
- small intestine
  - jejunum
  - ileum
  - ileocaecal junction
- appendix
- ascending, transverse, descending and sigmoid portions of colon
- rectum and anal canal

Arteries
- Inferior mesenteric
  - Left colic
  - Sigmoidal
  - Superior rectal
  - Marginal

Veins
- Portal vein and portal-systemic anastomoses

e) Inferior mesenteric

Posterior Abdominal Wall:

Bones — A typical lumbar vertebra
- Body
- Superior & inferior articular facets
- Transverse processes

Arteries — Abdominal aorta
- Renal
- Gonadal
- Bifurcation
  - Common iliac
    - Internal iliac
    - External iliac

Veins — Inferior vena cava
- Bifurcation
  - Common iliac
    - Internal iliac
    - External iliac
- Right renal vein
- Right gonadal vein
- Right suprarenal vein

Muscles
- Quadratus lumborum
- Iliacus
- Psoas major
- Transversus abdominis
- Diaphragm
  - Opening for inferior vena cava
  - Hiatus for esophagus
  - Path of aorta
  - Left and right crura
  - Median, medial, and lateral arcuate ligaments

b) Be able to describe:

The anatomical relationships between components of the urinary system and other abdominal viscera

Nov. 5. Week 9.

The Pelvis: Walls and Viscera

Dr. Krebs

Be able to identify:

- Bones
  - Pelvis
    - Sacrum
      - Ala
      - Facet for sacroiliac joint
    - Hip (Pelvic) Bone
      - Acetabulum
      - Ischiopubic (pubic) arch
      - Greater sciatic notch
      - Lesser sciatic notch
      - Obturator foramen
      - Ilium
        - Anterior superior iliac spine
        - Crest
        - Iliac fossa
      - Ischium
        - Spine
        - Tuberosity
      - Pubis
        - Tubercle
        - Crest
        - Pubic Symphysis
    - Coccyx
- Ligaments
  - Sacrospinous
  - Sacrotuberous
- Muscles
  - Obturator internus
  - Piriformis
  - Levator ani
- Peritoneum
  - In Female
    - Rectouterine pouch
    - Broad ligament
      - Mesosalpinx
      - Mesovarium
    - Ligament of ovary
    - Suspensory ligament of ovary
    - Round ligament of uterus
- Viscera
  - : Rectum
  - Uterus
  - Ovaries
  - Seminal vesicles
  - Prostate
  - Right and left kidneys
    - Renal pelvis

Right and left adrenal (suprarenal) glands
Ureter: - In female, note relationship to uterine artery
- In male, note relationship to vas deferens
Urinary Bladder
Urethra

Arteries Internal iliac
- Uterine

Nerves
Pudendal nerve

Nov. 12. Week 10.

The Perineum
Dr. Krebs

Be able to identify:

Bones Pelvis - Coccyx
- Ischiopubic arch
- Pubic symphysis
- Ischial spine
- Ischial tuberosity

Perineum - Anal triangle
- Urogenital triangle

Anal triangle - Levator ani
- Ischiorectal fossa
- Pudendal nerve, Internal pudendal artery and vein
- Inferior rectal nerves, arteries and veins
- Obturator internus

Urogenital triangle - Perineal membrane (describe the position of the deep perineal pouch)
- Superficial perineal pouch
  - Corpus cavernosum - crus of clitoris or penis
  - Ischiocavernosus muscle
  - Corpus spongiosum (male)
  - Bulb of the vestibule (female)
  - Bulbospongiosus muscle

- Superficial transverse perineus muscle
- Pudendal nerve - Dorsal nerve of clitoris or penis
- Perineal nerve - Posterior scrotal or Posterior labial nerves
- Dorsal artery of penis or clitoris
- Dorsal vein of penis or clitoris
- Greater vestibular (Bartholin's) glands (female)

- Glans of the clitoris, Glans penis
- Vagina
- Urethra (male and female)

Weeks 11 – 14 Head and Neck

Nov. 19. Week 11.

THE HEAD AND NECK (1): BASIC DESIGN AND INTRODUCTION TO THE CRANIAL NERVES
Dr. VOGL

Be able to identify (inside the cranial cavity):

Meninges:

f) dura (Falx cerebri and Tentorium cerebelli)
g) arachnoid
h) pia

Bones:

i) lesser wing of sphenoid
j) petrous ridge
k) sella turcica
l) pituitary fossa
m) anterior cranial fossa
n) middle cranial fossa
o) posterior cranial fossa

Arteries:

p) internal carotid
q) ophthalmic
r) vertebral
s) middle meningeal

Cranial Nerves:

t) I – Ophthalmic
u) II – Optic
v) III – Oculomotor
w) IV – Trochlear
x) V – Trigeminal
y) VI – Abducens
z) VII – Facial
aa) VIII – Vestibulocochlear
bb) IX – Glossopharyngeal
cc) X – Vagus
dd) XI – Accessory
ee) XII - Hypoglossal

Nov. 26. Week 12.

THE HEAD AND NECK (2): Cranial nerves V and VII
Dr. VOGL

Understand the functional difference between Cranial nerves V and VII on the face.

On a skull:
Identify:

ff) Temporal, parietal, frontal, occipital, zygomatic and sphenoid bones, and the mandible.
gg) Zygomatic arch
hh) Supraorbital foramen
ii) Infraorbital foramen
jj) Mental foramen
kk) Foramen spinosum
ll) Internal auditory meatus
mm) External auditory meatus
nn) Mandibular canal

Be able to:
- Describe the general course and distribution of cranial nerve V
- Identify the major muscles of mastication (masseter and temporalis) and know which cranial nerve innervates them
- Know the cranial nerve that innervates the upper and lower teeth
- Describe the general course and distribution of cranial nerve VII
- Describe the functions of cranial nerve VII
- Identify orbicularis oris, orbicularis oculi, occipito-frontalis and bucinator muscles
- Identify branches of cranial nerve VII on the face
- Identify the parotid gland and parotid duct

Dec. 3. Week 13.

Head and Neck (3): Organization of the Neck: The Anterior triangle
Dr. Vogl

Be able to outline the boundaries of the anterior and posterior triangles of the neck on yourself and on the cadaver.

Identify on the cadaver:

Bones:

Inferior margin of mandible
Mastoid process
Hyoid bone
Manubrium
Clavicle

Muscles:

Sternocleidomastoid
Trapezius
"Strap" muscles (infrahyoid muscles)
oo) Sternohyoid
pp) Omohyoid
qq) Sternothyroid
rr) Thyrohyoid
Suprahyoid muscles
ss) digastric
tt) mylohyoid
uu) stylohyoid

Carotid sheath (identify contents)

Larynx

- cricothyroid membrane (cricovoval membrane)

Arteries:

Common carotid (bifurcation at C3/4; superior margin of thyroid cartilage)
vv) External carotid
ww) Superior thyroid
xx) Lingual
yy) Facial
zz) Occipital

aaa) Maxillary
bbb) Superficial temporal
ccc) Internal Carotid
(understand that the vertebral artery from the subclavian on each side also courses through the neck and into the head)

Know where the "pulse points" are in the head and neck.
Know where emergency access to the airway can be established in the neck.

Veins:
Internal Jugular

Nerves:
X
XII
Ansa Cervicalis
Phrenic

Glands:
Thyroid

Dec. 10. Week 14.

Head and Neck (4): The Airway and Digestive Tract
Dr. Vogl

Be able to identify the major defined regions or compartments of the head

Be able to describe the relationship between the oral and nasal cavities of the head with the pharynx in the neck. Describe the position of larynx and palates (soft and hard) with respect to the airway and digestive tracts

Be able to describe how the oral and nasal cavities are connected to the larynx and esophagus by the pharynx, and describe the function of the valve mechanisms that functionally separate the airway from the digestive tract.

On a skull:

ddd) Identify temporal, parietal, frontal, occipital, zygomatic and sphenoid bones, and the mandible.

eee) Regions: Cranial Cavity
Orbits
Position of the "ears"
Petrous part of temporal bone (area of inner and middle ear)
Temporal region
Infratemporal region
Nasal cavities
Pterygopalatine Fossa
Bony boundaries of the oral cavity

Identify on a cadaver:

The pharynx:

nasopharynx

fff) opening of the eustachian tube

ggg) position of pharyngeal tonsil

oropharynx

hhh) palatoglossal folds

iii) palatopharyngeal folds

jjj) palatine tonsils

kkk) lingual tonsils

Laryngopharynx

lll) Piriform recesses

mmm) Valleculae

Nerves:

IX

The larynx (from posterior)

nnn) superior laryngeal aperture
ooo) epiglottis

The nasal cavities (from posterior)

ppp) choannae
qqq) nasal septum

The oral cavity (from posterior)

*rrr)*oropharyngeal isthmus
*sss)*soft palate
ttt) tongue