

Bio& 241 A&P: Unit 4 Lab 3

Spinal cord/Cranial/Spinal Nerves

G Blevrns/G Brady
Updated Fall 2007

Spinal Cord Menings:

Dura mater	Arachnoid mater	Subarachnoid space
Pia mater		

External Anatomy of Spinal Cord:

Ventral root	Dorsal root	Dorsal root ganglion
--------------	-------------	----------------------

Internal Anatomy of Spinal Cord:

Ventral horn	Dorsal horn	Lateral horn
Dorsal Gray commissure	Ventral gray commissure	Central canal
Posterior column	Lateral column	Anterior column
Anterior Median Fissure		Posterior Median Sulcus

Cranial Nerve (12 pairs)

Number and Name

Type

Function

(I) Olfactory (Olfactory foramen)	Sensory	Smell / Nerves arise in olfactory mucosa and run through cribriform plate of ethmoid to synapse with bulb
(II) Optic (Optic foramen)	Sensory	Vision / Nerves arise in the retina of the eyes pass back to the optic chiasma
(III) Oculomotor (Superior Orbital fissure)	Primarily motor	Movement of eye / Inferior Oblique and Superior, Inferior, Medial Rectus muscles and Levator Palpebrae Superioris Motor / Pupillary constriction and Accommodation of the lens Sensory / Muscle Proprioception
(IV) Trochlear (Superior Orbital fissure)	Primarily Motor	Motor / Superior Oblique muscle Sensory / Muscle Proprioception
(V) Trigeminal (Superior Orbital fissure)	Both	Ophthalmic branch / Sensory fibers that innervate the orbit cornea, and upper eyelid of the eye, skin of the nose and forehead and mucosa of Frontal, Sphenoid, and Ethmoid Paranasal Sinuses. (Pain, Temperature, Touch, and Proprioception) Maxillary Branch / Sensory fibers that innervate the lower eyelid, skin of the temple, upper cheek, and upper lip, mucous membranes of the palate, pharynx, upper gums and teeth. (Pain, Temperature, touch, and Proprioception) Mandibular Branch / Sensory fibers that innervate skin of the auricle temporal region, lower lip, external auditory meatus, and lower jaw, tympanic
(Foramen rotundum)		
(Foramen Ovale)		

			membrane, teeth and gum of lower jaw, and oral mucosa of the cheek, floor of the mouth, anterior 2/3 of the tongue. Motor / fibers innervate the muscles of mastication, swallowing, movement of the palate, auditory tube, tympanic membrane, and ear ossicles
(VI)	Abducens (Superior Orbital fissure)	Primarily motor	Motor / Lateral Rectus Muscle Sensory / Muscle Proprioception
(VII)	Facial (Internal Acoustic meatus)	Both	Sensory / Taste buds of the anterior 2/3 of the tongue and muscle proprioception of the face and scalp. Motor / innverates the muscle of facial expression, scalp, and neck, lacrimal, sublingual, submandibular, palatine, and nasal glands
(VIII)	Vestibulocochear (Acoustic) (Statoacoustic) (Internal Acoustic meatus)	Sensory	Vestibular Branch / conveys impulses associated with both dynamic and static equilibrium from the semicircular ducts and the vestibule. Cochlear Branch / conveys impulses from the cochlea of the inner ear associated with hearing.
(IX)	Glossopharyngeal (Julgular foraman)	Primarily Motor	Sensory / taste buds of the posterior 1/3 of the tongue, touch, pressure, temperature, pain receptors of the tongue, the carotid sinus, and muscle proprioception of the muscles of swallowing. Motor / muscles of swallowing and the partotid salivary gland
(X)	Vagus (Julgular foraman)	Both	Sensory / conveys visceral impulses about distention, pressure, and chemical conditions of organs, taste impulses from the throat and epiglottis, also muscle proprioception Motor / Muscles of airways, lungs, esophagus, heart, stomach, small and large intestine, gallbladder
(XI)	Spinal Accessory (Julgular foraman)	Primarily Motor	Motor / Voluntary muscles of the pharynx, larynx, and soft palate, Trapezius and Sternocleidomastoid Sensory / Muscle Proprioception (SVE)
(XII)	Hypoglossal (hypoglossal canal)	Primarily Motor	Motor / Muscles of the tongue for speech and swallowing Sensory / Muscle Proprioception

**Spinal Nerves and Plexuses:
(31 pairs of spinal nerves and 4 plexuses)**

Spinal Nerves (Spinal nerves exit the vertebral column via intervertebral foramen)

Cervical	8 pairs
Thoracic	12 pairs
Lumbar	5 pairs
Sacral	5 pairs

<u>Plexus:</u>	<u>Spinal Nerves</u>	<u>Nerves that arise</u>
Cervical	(C1 through C5)	Phrenic
Brachial	(C5 through T1)	Axillary Ulnar Radial Median
Lumbar	(L1 through L4)	Genitofemoral Femoral
Sacral	(L4 through S4)	Pudendal Sciatic

** Thoracic nerves do not form Plexuses with the exception of T1. These nerves are very segmental following each rib laterally.

Nerve Functions:

Phrenic:	<u>Motor:</u> Innervates the diaphragm
Axillary	<u>Motor:</u> Deltoid and Teres minor <u>Sensory:</u> Lateral arm to the deltoid tuberosity
Radial	<u>Motor:</u> Triceps, Supinator, and brachioradialis <u>Sensory:</u> Posterior arm and forearm, medial side of the posterior hand
Median:	<u>Motor:</u> Pronator teres and Flexor carpi radialis <u>Sensory:</u> Palmar aspect of thumb, 2 nd , 3 ^d , 4 th fingers.
Ulnar	<u>Motor:</u> Flexor carpi ulnaris <u>Sensory:</u> Medial portion of 4 th and all of the 5 th fingers
Genitofemoral:	<u>Motor:</u> cremaster muscle, <u>Sensory:</u> Skin of the medial anterior thigh, scrotum, and labia majora
Femoral:	<u>Motor:</u> Iliacus, Pectineus, Quadriceps femoris, and Sartorius <u>Sensory:</u> Skin of the lateral anterior thigh, and dorsum of the foot
Pudendal:	<u>Motor:</u> Ischiocavernosus, Bulbospongiosus, Levator ani, External anal sphincter

Sensory: Skin of the penis and scrotum, clitoris, labia majora and minora, vagina

Sciatic
(main branches Tibial
And fibular)

Motor: Semimembranous, Semitendinosus, Biceps femoris, Adductor magnus

Sensory: Lateral posterior leg, lateral aspect and plantar surface of the foot

Skull Review:

Internal acoustic meatus
Cribriform plate Foramen
rotundum Jugular foramen

chiasmatic groove
Olfactory foramen
Foramen Ovale
Hypoglossal canal

Optic foramen
Superior Orbital Fissure
Internal Acoustic meatus
Foramen magnum

Muscles to review:

Sternocleidomastoid
Diaphragm
Triceps brachii
Pectinues
Ischiocavernosus
Semimembranous
Adductor magus

Trapezius
Deltoid
Flexor Carpi Ulnaris
Quadriceps Femoris
Bulbospongiosus
Semitendinosus

Genioglossus
Teres minor
Flexor Carpi Radialis
Sartorius
External anal Sphincter
Biceps Femoris

Styloglossus
Cremaster
Iliacus
Levator Ani