

Nerves

I. Cervical plexus (most branches are included under Head and Neck)

A. Phrenic nerve (C3–5)

function – sensory & postganglionic sympathetic innervation to pericardium & central tendon (& adjacent pleura & peritoneum); motor (lmn) & postganglionic sympathetic innervation to diaphragm

II. Thoracic spinal nerves

A. Dorsal rami

1. Medial branch

function – sensory & postganglionic sympathetic innervation to back muscles & overlying skin; motor (lmn) innervation of back muscles

2. Lateral branch

function – sensory & postganglionic sympathetic innervation to back muscles & overlying skin; motor (lmn) innervation of back muscles

B. Ventral rami

1. Intercostal n. (T1–6)

function – sensory & postganglionic sympathetic innervation to intercostal muscles, parietal pleura & skin; motor (lmn) innervation of intercostal muscles

a. Lateral cutaneous branch

function – sensory & postganglionic sympathetic innervation of skin overlying lateral aspect of intercostal space

b. Anterior cutaneous branch

function – sensory & postganglionic sympathetic innervation of skin overlying anterior aspect of intercostal space

c. Collateral branch

function – redundant with remainder of nerve

d. Intercostobrachial n. (T2 only)

function – sensory & postganglionic sympathetic innervation of skin overlying proximal, medial aspect of arm

2. Intercostal n. (T7–11)

function – sensory & postganglionic sympathetic innervation to intercostal muscles, anterior abdominal muscles, peripheral diaphragm, parietal pleura & parietal peritoneum; motor (lmn) innervation of intercostal muscles and muscles of anterior abdominal wall

a. Lateral cutaneous branch

function – sensory & postganglionic sympathetic innervation of skin overlying lateral aspect of intercostal space & adjacent anterior abdominal wall

b. Anterior cutaneous branch

function – sensory & postganglionic sympathetic innervation of skin overlying rectus abdominis muscle

c. Collateral branch

function – redundant with remainder of nerve

3. Subcostal nerve (T12)

function – sensory & postganglionic sympathetic innervation to skin overlying lateral and anterior abdominal wall, parietal peritoneum & muscles of anterior abdominal wall; motor (lmn) innervation of muscles of anterior abdominal wall

III. Lumbar nerves

A. Dorsal rami

1. Medial branch

function – sensory & postganglionic sympathetic innervation to back muscles & overlying skin; motor (lmn) innervation of back muscles

2. Lateral branch

function – sensory & postganglionic sympathetic innervation to back muscles & overlying skin; motor (lmn) innervation of back muscles

B. Ventral rami

1. Iliohypogastric nerve (L1)

function – sensory & postganglionic sympathetic innervation of skin overlying lower anterior abdominal wall; sensory, postganglionic sympathetic & motor (lmn) innervation of muscles of the anterior abdominal wall

2. Ilioinguinal nerve (L1)

function – sensory & postganglionic sympathetic innervation of skin overlying proximo-medial thigh, root of the penis & scrotum or mons pubis & labium majorum; sensory, postganglionic sympathetic & motor (lmn) innervation of muscles of the anterior abdominal wall

3. Genitofemoral nerve (L1–2)

a. Genital branch

function – sensory & postganglionic sympathetic innervation of the skin overlying part of the labium majorum or scrotum; sensory, postganglionic sympathetic & motor (lmn) innervation of the cremaster muscle

b. Femoral branch

function – sensory & postganglionic sympathetic innervation of skin overlying the femoral triangle

4. Lateral cutaneous nerve of the thigh

function – sensory & postganglionic sympathetic innervation of the skin overlying the lateral aspect of the thigh

5. Muscular branches

function – sensory, postganglionic sympathetic and motor (lmn) innervation of the psoas and quadratus lumborum muscles

IV. Sacral nerves

A. Dorsal rami

B. Ventral rami

1. Posterior femoral cutaneous n.

a. Gluteal branches

function – sensory & postganglionic sympathetic innervation of skin overlying part of the gluteus maximus

b. Perineal branches

function – sensory & postganglionic sympathetic innervation of skin overlying part of the posterior aspect of the perineum

2. Pudendal n. (S2–4)

a. Inferior rectal n.

function – sensory & postganglionic sympathetic innervation of the skin overlying the anus; sensory, postganglionic sympathetic & motor (lmn) innervation of the external anal sphincter

b. Perineal n.

i. Muscular branches

function – sensory, postganglionic sympathetic & preganglionic parasympathetic innervation of the corpus spongiosum or bulb of the vestibule; sensory & postganglionic sympathetic innervation of the spongy urethra; sensory, postganglionic sympathetic & motor (lmn) innervation of the perineal muscles

ii. Posterior labial or scrotal branches

function – sensory & postganglionic sympathetic innervation of the skin overlying the labia majora & minora, lower vagina & urethra or scrotum

c. Dorsal nerve of clitoris or penis

function – sensory & postganglionic sympathetic innervation of the skin overlying penis or clitoris; sensory, postganglionic sympathetic & preganglionic parasympathetic innervation to the corpus cavernosum

V. Autonomics

A. Sympathetic trunks

1. Rami communicans

a. White (T1–L2)

function – carry preganglionic sympathetic axons to the sympathetic chain (ganglia), celiac, superior mesenteric and aorticorenal ganglia, and sensory axons from the viscera to the spinal cord

b. Gray (C1–S5)

function – carry postganglionic sympathetic axons from the sympathetic chain to the spinal nerves for distribution through the dorsal and ventral rami

2. Medial sympathetic nerves

a. Cardiopulmonary splanchnic nerves

function – carry sensory and postganglionic sympathetic axons passing from the cervical and upper thoracic sympathetic ganglia to the cardiac and pulmonary plexuses

b. Upper thoracic splanchnic nerves (T1–5)

function – carry sensory and postganglionic sympathetic axons passing from the upper

thoracic sympathetic chain to the aortic plexus

c. Lower thoracic splanchnic nerves (T5–12)

i. Greater splanchnic nerve (T5–9) (G. splanchnon, viscus)

function – carries preganglionic sympathetic axons to the celiac ganglion and sensory axons from the viscera supplied by the celiac artery

ii. Lesser splanchnic nerve (T10–11)

function – carries preganglionic sympathetic axons to the superior mesenteric ganglion and sensory axons from the viscera supplied by the superior mesenteric artery

iii. Least splanchnic nerve (T12)

function – carries preganglionic sympathetic axons to the aorticorenal ganglion and sensory axons from the viscera supplied by the renal, suprarenal and gonadal arteries

d. Lumbar splanchnic nerves (L1–5)

function – carries preganglionic sympathetic axons to the inferior mesenteric ganglion and scattered ganglia in the hypogastric plexus, and sensory axons from the viscera supplied by the inferior mesenteric and internal iliac arteries

e. Sacral splanchnic nerves (S1–5)

function – carries preganglionic sympathetic axons to scattered ganglia in the hypogastric plexus, and sensory axons from the viscera supplied by the inferior mesenteric and internal iliac arteries

3. Prevertebral Ganglia

a. Celiac

function – houses postganglionic sympathetic neuronal cell bodies innervating viscera supplied by branches of the celiac artery

b. Superior mesenteric

function – houses postganglionic sympathetic neuronal cell bodies innervating viscera supplied by branches of the superior mesenteric artery

c. Aorticorenal

function – houses postganglionic sympathetic neuronal cell bodies innervating viscera supplied by branches of the renal, suprarenal and gonadal arteries

d. Inferior mesenteric

function – houses postganglionic sympathetic neuronal cell bodies innervating viscera supplied by branches of the inferior mesenteric artery

4. Plexuses (L. a braid)

a. Cardiac

function – carries sensory, postganglionic sympathetic (cardiopulmonary splanchnic nerves) and preganglionic parasympathetic (vagal) axons innervating the heart and coronary arteries

b. Pulmonary

function – carries sensory, postganglionic sympathetic (cardiopulmonary splanchnic nerves) and preganglionic parasympathetic (vagal) axons to the pulmonary and bronchial arteries, trachea and bronchi

c. Celiac

function – carries sensory, preganglionic sympathetic (greater splanchnic nerves), postganglionic sympathetic (from the celiac ganglion) and preganglionic parasympathetic (vagal) axons to the viscera supplied by the celiac artery

d. Superior mesenteric

function – carries sensory, preganglionic sympathetic (lesser splanchnic nerves), postganglionic sympathetic (from the superior mesenteric ganglion), and preganglionic parasympathetic axons (vagus) to the viscera supplied by the superior mesenteric artery

e. Aorticorenal

function – carries sensory, preganglionic sympathetic (least splanchnic nerves), postganglionic sympathetic (from the aorticorenal ganglion), and preganglionic parasympathetic axons (vagus) to the viscera supplied by the renal, suprarenal and gonadal arteries

f. Inferior mesenteric

function – carries sensory, preganglionic sympathetic (lumbar splanchnic nerves), postganglionic sympathetic (from the inferior mesenteric ganglion), and preganglionic parasympathetic axons (pelvic splanchnic) to the viscera supplied by the inferior mesenteric artery

g. Hypogastric

function – carries sensory, preganglionic sympathetic (lumbar splanchnic nerves), postganglionic sympathetic (from scattered ganglia), and preganglionic parasympathetic axons (pelvic splanchnic nerves) to the viscera supplied by the internal iliac artery

B. Parasympathetic

1. Vagus nerve (L. wandering)

function – carries preganglionic parasympathetic axons innervating thoracic and abdominal viscera to the level of the left colic flexure, and sensory axons innervating the same viscera

a. Left recurrent laryngeal n.

function – covered in Unit II

b. Vagal trunks

function – carries preganglionic parasympathetic axons innervating abdominal viscera to the level of the left colic flexure, and sensory axons innervating the same viscera

2. Pelvic splanchnic nerves (S2–4)

function – carry sensory and preganglionic parasympathetic axons innervating the descending colon, sigmoid colon, rectum, bladder, uterus and erectile tissues

3. Pudendal nerve

function – carries preganglionic parasympathetic axons to the corpus spongiosum (bulb of the vestibule) and corpora cavernosa (other pudendal functions are listed above)