

1. The preganglionic neuron has its cell body in the lateral horn of the spinal cord between T1 and L2-3. Its preganglionic fiber, or axon, leaves the spinal cord with the ventral ramus of the spinal nerve and enters the sympathetic trunk through a white rami communicans. The preganglionic fiber descends in the sympathetic chain until it reaches a level adjacent to S1 spinal nerve and synapses in postganglionic neurons in the sympathetic chain ganglia. The postganglionic fiber or axon leaves the sympathetic trunk through a grey ramus and enters the S1 spinal nerve to be distributed to the sweat gland in S1 dermatome.

2. The preganglionic fibers of this neural pathway arise from preganglionic neurons in the lateral horn of the spinal cord between T1 and L2-3. The preganglionic fibers enter the sympathetic trunk through white rami communicans and ascend in the sympathetic chain and synapse (remember the embryonic origin of the heart). The postganglionic fibers travel from the sympathetic chain medially and enter the heart by means of the cardiac nerves. These fibers **would not** enter the grey rami communicans.

3. The preganglionic fibers of this neural pathway arise from neurons in the lateral horn of the spinal cord between T1 and L2 or L3. The preganglionic fibers enter the sympathetic trunk through the white rami communicans and travel through the trunk without synapsing. They leave the cord medially to form the greater splanchnic nerves (one on each side), which pierce the crura of the diaphragm (look for them there when you get to this region) and synapse in the celiac ganglia. Postganglionic fibers travel to and innervate the stomach.

4. The preganglionic fibers of this neural pathway arise from preganglionic parasympathetic neurons in spinal cord levels S2,3,4. The preganglionic fibers form the pelvic splanchnic nerves which terminate in the walls of the genitalia. There they synapse on groups of neurons (the terminal ganglia). Postganglionic fibers then travel very short distances within the organ to innervate muscles and glands.

5. The adrenal gland gets two kinds of sympathetic supply. The most important is the supply to the adrenal medulla. Preganglionic sympathetic fibers that travel within the greater (major supply) and lesser splanchnic nerve terminate in the adrenal medulla on chromaffin cells. The chromaffin cells secrete adrenalin (epinephrine), a substance that enhances your hype response. **This pathway is the only example in the body where effector action is elicited in the autonomic nervous system in the absence of a postganglionic fiber.** In addition, other preganglionic sympathetic fibers traveling mainly in the lesser splanchnic nerve synapse in the aorticorenal ganglia. Postganglionic sympathetic fibers then innervate the extensive blood supply to the adrenal cortex and medulla.

6. The vagus nerves provide parasympathetic supply to the stomach up to and including the transverse colon. Preganglionic fibers arise in the brainstem (nucleus of the vagus nerve) and descend into the abdomen. The fibers would synapse in parasympathetic postganglionic neurons in terminal ganglia located in the wall of the stomach. Short postganglionic fibers would travel to the muscle or gastric glands within the stomach and supply it. Branches of the right vagus nerve would supply the posterior wall of the stomach and branches of the left vagus nerve would supply the anterior wall of the stomach. Why would that be? Refer to the embryology which is a very important component of this block.

1. the greater splanchnic nerve: preganglionic sympathetic
2. the lumbar splanchnic nerves: preganglionic sympathetic
3. the vagus nerve: preganglionic parasympathetic
4. the grey ramus communicans: postganglionic sympathetic
5. the sciatic nerve: postganglionic sympathetic
6. the white rami communicans: preganglionic sympathetic
7. the pelvic splanchnic nerves: preganglionic parasympathetic

Remember that visceral afferents will travel with all these fibers (1-7) but are not considered to be components of the autonomic system.