

## NEUR0010 Somatosensation Quiz – Answer Explanations

Indicate all FALSE statements regarding somatic sensation:

A) The hands are innervated only by the cervical nerves.

TRUE. If you look at a picture of a dermatome map, you'll see that the hands are only innervated by the cervical (C) nerves.

B) A lesion on the right side of the spinal cord at level T1 would affect the ability to feel touch in the right hand.

FALSE. Dermatome T1 is below the level of the hand, so lesioning it would not have any effect on somatic sensation in the hand.

C) The genitalia are not innervated by the sacral nerves because they are on the front side of the body.

FALSE. The genitalia are indeed innervated by the sacral nerves. Again, looking at a picture of a dermatome map helps.

D) A complete lesion of the spinal cord at level S2 would affect pain sensation in the genitalia.

TRUE. Because the genitalia are innervated by the sacral nerves, including S2, a complete lesion of the spinal cord at that level would affect pain (and touch) sensation in the genitalia.

E) The nerve that innervates the face is not considered a dermatome.

TRUE. The nerve that innervates the face is the trigeminal nerve. It is a cranial nerve, and dermatomes are spinal nerves, not cranial nerves.

F) To lose all sensation in one dermatome, one dorsal root innervating that dermatome must be cut.

FALSE. To lose all sensation in one dermatome, the dorsal root innervating that dermatome and three adjacent ones would have to be cut because of nervous system overlap and plasticity.

G) A lesion on the left side of the spinal cord at level T5 would affect the ability to feel extreme heat in the right lower leg.

TRUE. Dermatome T5 is above the leg, and since pain and temperature are carried by axons that decussate immediately at the spinal cord, a lesion on the left side of the spinal cord at T5 would cause one to lose pain and temperature sensation on the right side of their body below the cut.

H) An area of skin that only has Pacinian corpuscles would perform better at a two-point discrimination task than an area of skin that only has Merkel's disks.

FALSE. Pacinian corpuscles have large receptive fields, whereas Merkel's disks have smaller receptive fields. An area of skin that has smaller receptive fields would perform better at a two-point discrimination task.

I) There are six pairs of cranial nerves, making a total of 12.

FALSE. There are 12 pairs of cranial nerves, making a total of 24.

J) Pacinian corpuscles have a higher maximum sensitivity to the amount of skin indentation than do Meissner's corpuscles.

TRUE. This one is very tricky. According to Figure 12.4 (Page 419) in the Fourth edition of the textbook, Pacinian corpuscles have a lower minimum *threshold* to the amount of skin indentation than do Meissner's corpuscles. Because threshold is the opposite (technically, the reciprocal) of sensitivity, Pacinian corpuscles have a higher maximum *sensitivity* to the amount of skin indentation compared to Meissner's corpuscles. Another way to think about threshold and sensitivity is to think about pain; if you have a low threshold for pain, you're more sensitive to it.

**ANSWERS: B, C, F, H, I**