1. A 30 year old woman who runs a cappuccino bar came to you because she has been burning her left and right fingers on the steam pressurizer when she makes coffee. She says that she never notices the pain. She doesn’t realize that she has hurt her fingers until a few hours after it has happened. On examination you find the following signs:

1. touch sensation was normal over the entire right and left sides of body and face
2. position sense was normal for her upper and lower limbs
3. vibratory sense was normal when tested with a tuning fork on the bony prominences of the right and left arms and legs
4. when tested with a pin, pain sensation was normal on both sides of the face
5. pain sensation was absent on all fingers of both right and left hands
6. pain sensation was normal on the arms and rest of the body and face

Draw a cross-sectional diagram (similar to your slides) showing the damaged area of the nervous system that would produce these symptoms. Indicate on your diagram the SIDE of the lesion, the POSITION and NAMES of structures (tracts or nuclei) damaged, and the most likely LEVEL (e.g. caudal pons, T2 of spinal cord, dorsal part of postcentral gyrus, etc.) where the lesion would be found.

2. A 70 year old man awoke one morning to find that the right side of his body felt numb. He also said that he had no feeling on the right side of his face. On examination you found the following signs:

1. touch, vibratory, and proprioceptive sensation was absent over the entire right side of the body; touch and vibration was absent from the right face.
2. touch, vibratory, and proprioceptive sensation was normal on the left side of the body and face.
3. pin prick indicated that pain sensation was absent on the right side of the face but was normal on the left side of the face
4. pin prick sensation was normal on the right and left sides of the body.

Assume that damage at a single location in the nervous system caused the above symptoms. If more than one CNS level is possible, choose one. Draw a cross-sectional diagram (similar to your slides) showing a damaged area of the nervous system that would produce these symptoms. Indicate on your diagram the SIDE of the lesion, the POSITION and NAMES of structures (tracts or nuclei) damaged, and the most likely LEVEL (e.g. caudal pons, T2 of spinal cord, dorsal part of postcentral gyrus, etc.) where the lesion would be found.
3. A 60-year-old man came to you because he had cut the left side of his face on several occasions without knowing it. He said that over the past week he had cut his face while shaving, but he had not noticed it until someone mentioned it to him later each day. On examination you found the following signs:
   1. Touch, vibratory, and proprioceptive sensation was normal over the entire **right** and **left** sides of the face and body.
   2. Pin prick indicated that pain sensation was absent on the **left** side of the face.
   3. Sensation to pin prick was normal on the **right** and **left** sides of the body.

Assume a lesion at a single location in the nervous system caused the above symptoms. Draw a cross-sectional diagram (similar to your slides) showing a damaged area of the nervous system that would produce these symptoms. Indicate on your diagram the SIDE of the lesion, the POSITION and NAMES of structures (tracts or nuclei) damaged, and the most likely LEVEL (e.g. caudal pons, T2 of spinal cord, dorsal part of postcentral gyrus, etc.) where the lesion would be found. If you wish to receive full credit, **DRAW NEATLY**.

4. Dominek Hasek noticed that his **left** foot has felt clumsy lately and he has missed several goals because of it. A neurological exam showed that he could not describe the position of his left foot and toes when they were passively flexed or extended. Vibratory sense was absent from his left foot also. Position and vibratory senses were normal in his right foot and elsewhere on his body. Pin prick sensation in his left foot was felt but it was not sharp or well localized. Response to pin prick was normal over the rest of his body.

Draw a diagram showing the damaged area of the nervous system that would produce these symptoms. Indicate on your diagram the SIDE of the lesion, the POSITION and NAMES of structures (tracts or nuclei) damaged, and the most likely LEVEL (e.g. caudal pons, T2 of spinal cord, dorsal part of postcentral gyrus, etc.) where the lesion would be found. If you wish to receive full credit, **DRAW NEATLY**.
5. A 20 year old man came to the emergency room after he had been stabbed in the back. A CT scan showed that the knife edge had entered his spinal cord. On examination you found the following signs:
   1. touch, vibratory, and proprioceptive sensation was normal over the entire right and left side of the body.
   2. pin prick sensation was absent on the right side of the body below the level of the umbilicus.
   4. pin prick sensation was normal on the left side of the body.

Draw a cross-sectional diagram (similar to your slides) showing a damaged area of the nervous system that would produce these symptoms. Indicate on your diagram the SIDE of the lesion, the POSITION and NAMES of structures (tracts or nuclei) damaged, and the most likely LEVEL (e.g. caudal pons, T2 of spinal cord, dorsal part of postcentral gyrus, etc.) where the lesion would be found.

6. A 25 year old man who was trimming branches from tall trees in front of his house, fell off his ladder and was found unconscious on the ground. He was rushed to the emergency room and he was subsequently admitted to the hospital. After 24 hours, he regained consciousness. On examination he was alert and answered questions normally. However, you found the following signs:
   1. Tactile and vibratory sensation was absent over the entire left lower body and lower limb. He could not tell the orientation of his left leg when you moved it into different positions.
   2. Tactile sensation was normal on the entire right side of his body. He correctly indicated the position of his right leg when it was moved.
   3. Pin prick sensation was absent on the right side of the lower body and leg from the level of the umbilicus down.
   4. Pin prick sensation was normal on the entire left side of the body.

a. What SIDE is the lesion on: _________________

b. What is the most likely LEVEL (e.g. caudal pons, T2 of spinal cord, dorsal part of postcentral gyrus, etc.) where the lesion would be found: _________________

Draw a cross-sectional diagram (similar to your slides/not a longitudinal drawing) showing a damaged area of the nervous system that would produce these symptoms. Indicate on your diagram the POSITION and NAMES of structures (tracts or nuclei) damaged.
ANSWERS
1. ventral white commissure of spinal cord C4-C6
2. rostral pons or midbrain; Left side; VTT and medial lemniscus
3. caudal pons or rostral medulla; Left side; spinal trigeminal tract
4. posterior portion of paracentral lobule in Right hemisphere
5. Left ALS at level of T8
6. Left half of spinal cord at level T8