

## **Cranial nerves**

1. 12 pairs: each projects from brain stem
2. cousins to the segmental spinal nerves
3. CN's = 4 "types":
  - a. Motor
  - b. Sensory
  - c. Both (mixed)
  - d. Special sensory (sight, sound, balance, taste, smell)
4. SEE TABLE p. 419

## **Mnemonic Devices**

- OOOTTAFVGVAH
- OOOTTAFAGVSH

*Oh, Once One Takes The Anatomy Final, Very Good Vacations Are Heavenly!*

*On Old Olympus' Towering Top, A Finn And German Viewed Some Hops!*

## **Typical Cross-section of spinal cord:**

1. white matter: myelinated axons
2. grey matter: cell bodies, unmyelinated axons
3. ventral roots contain motor neurons
4. dorsal roots contain sensory neurons
5. spinal nerve is combo: ventral + dorsal roots

## **Meninges (spinal n.s @ intervertebral foramen):**

*Dura mater, Pia mater, Arachnoid*

# Spinal nerves

1. Segmentally arranged: 31 pairs

8 cervical (C1-C8)

12 thoracic (T1-T12)

5 lumbar (L1-L5)

5 sacral (S1-S5)

1 coccygeal (Co1)

**Question:** aren't there only 7 cervical vertebrae?

2. Dorsal root ganglion:

- found at every spinal segment

- contains cell bodies of sensory nerves

3. Leave spinal column @ Intervertebral foramen

- @ foramen: nerves transmit both sensory & motor info

4. Spinal nerves split into 2 rami (S&M):

a. dorsal rami - skin/muscles of back

b. ventral rami - skin/muscles of thorax, abdomen, limbs

5. CT layers assoc. with spinal nerves:

a. Endoneurium: (Schwann cells) around axon

b. Perineurium: bundles several axons into a fascicle

c. Epineurium: bundles several fascicles into a "nerve"

## **Spinal nerves are lumped 3 nerve plexuses:**

- cervical, brachial, lumbosacral
- nerves that provide motor-input to a muscle
- provide sensory feed-back from m.s & skin

### **Cervical plexus - (C1-C5)**

1. phrenic nerve - diaphragm (controls breathing)
2. cervical n. - levator scapulae, trapezius, SCM

### **Brachial plexus - (C5-T1)**

1. axillary n. - deltoid, teres minor
2. radial n. - extensors of arm, forearm, wrist, fingers
3. median n. - flexors of forearm, wrist, fingers
4. ulnar n. - flexor carpi ulnaris (m.s of the hand)
5. musculocutaneus n. - flexors of arm

### **Lumbosacral plexus - (T12-S4).**

1. gluteal n. - gluteal muscles
2. obturator n. - adductors of thigh
3. femoral n. - extensors of knee
4. sciatic n. = tibial + fibular n.s
  - tibial ("sciatic"): flexors of knee semimemb./semitend.
  - tibial: biceps femoris (lh), flexors of ankles + toes
  - fibular: biceps femoris (sh), fibularis muscles
  - fibular: dorsi-flexors of ankle/toes
5. podendal n. - GI/UG sphincters, external genitalia

**Dermatome = segmental innervation of skin**

- Why is the dermatome map distorted?

**Cerebrovascular Accident (CVA = stroke)**

**Paralysis** - loss of motor control

**Paraplegia** - paralysis of the lower limbs

**Hemiplegia** - paralysis of one side of body

**Quadriplegia** - paralysis of all 4 limbs

**Palsy** - regional loss of sensory/motor function

# Reflexes

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## Reflexes are categorized by

1. developmental history: innate or acquired
2. processing site: brain or spinal cord
3. circuit complexity: monosynaptic or polysynaptic
4. motor response: visceral (ANS) or somatic

## Reflex arc: 5-step process

1. stimulus of the receptor  
ex: pain or stretch
2. sensory neuron (*dorsal root*) sends info to CNS
3. processing of the sensory info
  - a. sensation relayed to brain (?)
  - b. sensation relayed to pool of motor neurons
4. motor neuron (*ventral root*) is activated
5. peripheral effectors respond
  - a. muscle
  - b. glands