CRANIAL NERVES

I The three name (letter) system of classification

Examples:

II Definitions of the three names

A. The First Classification - General (G) or Special (S)

   General- distributed throughout body

   Special- restricted area of the body

B. The Second Classification - Visceral (V) or Somatic (S)

   Visceral-

   Somatic- somites, soma, body

   Skin, muscle, joints

C. The Third Classification - Afferent (A) or Efferent (E)

   Afferent-

   Efferent-
III. Schematic Representation Of The Anatomy Of Cranial Nerves

A. Afferent fibers-

1. General Somatic Afferent (GSA) in cranial nerves- V, VII, IX, X

2. Special Visceral Afferent (SVA) in cranial nerves- I, VII, IX, X

3. General Visceral Afferent (GVA) in cranial nerves- VII, IX, X

B. Efferent fibers-

1. General Visceral Efferent (GVE) - autonomic, parasympathetic in cranial nerves- III, VII, IX, X

2. General Somatic Efferent (GSE) in cranial nerves- III, IV, VI, XII

3. Special Visceral Efferent (SVE) dervied from branchial, gill-arches in cranial nerves- V, VII, IX, X, XI

Motoneurons, like those in ventral horn

Ach released onto striated muscles

Sensory nucleus

Preganglionic neuron

Postganglionic neuron

CNS

PNS

Border

Ganglion

Receptor

Neuromuscular junction

Neuron
IV  Organization of Cranial Nerves

1. **Olfactory Nerve** - SVA

2. **Optic Nerve** - SSA

3. **Oculomotor nerve**
   
   A. GSE Component
   
   muscle   --  action
   
   medial rectus – adducts eye
   superior rectus – elevates eye
   inferior rectus – depresses eye
   inferior oblique – rotates eye laterally
   levator palpebrae superiorius- lifts eyelid

   B. GVE component
   
   Edinger-Westphal nucleus  
   (ciliary ganglion)*
   ciliary muscle –
   pupillary sphincter -

   * you will not be examined on material within parentheses

   C. Symptoms of damage:
   
   1. ptosis-
   2. eye deviated down and out
   3. dilated pupil-
   4. diplopia-
4. **Trochlear Nerve**

   A. GSE component

   ![Diagram showing the trochlear nucleus and superior oblique](image)

   B. Symptoms of damage to c.n.IV: can’t look down while looking nasally

5. **Trigeminal Nerve**

   A. GSA components

   ![Diagram showing the spinal nucleus, spinal tract, V ganglion, chief sensory, mesencephalic nucleus, and mes. tract of V](image)

   1. nociceptors, thermoreceptors and some mechanoreceptors
   2. Supply -

   ![Diagram showing the chief sensory, mesencephalic nucleus, and mes. tract of V](image)

   many mechanoreceptors

   ![Diagram showing the motor nucleus and mes. tract of V](image)

   proprioceptors

   B. SVE component

   ![Diagram showing the motor nucleus of V](image)

   1.
   2.
C. Prominent signs of damage to c.n. V:
   1. weakness -
   2. anesthesia -
   3. loud noises -

6. Abducens Nerve
   A. GSE component

   ![Diagram of Abducens Nerve]

   abducens nucleus \(\rightarrow\) lateral rectus

   B. Prominent symptoms of damage:
      1. eyes at rest
      2. 
      3. 
      4. 

7. Facial Nerve
   A. SVA component

   ![Diagram of Facial Nerve]

   solitary nucleus \(\rightarrow\) solitary tract \(\rightarrow\) geniculate ganglion \(\rightarrow\) taste buds

   B. SVE component

   ![Diagram of Facial Nerve]

   facial nucleus \(\rightarrow\)
C. GSA component

spinal tract of V
spinal nucleus of V

(geniculate ganglion)

D. GVA component

solitary tract
solitary nucleus
mechanoreceptors

(geniculate ganglion)

E. GVE component

superior salivatory

(sphenopalatine ganglion)

(submandibular ganglion)

F. Prominent symptoms of damage to c.n. VII –ipsilateral, Bell’s palsy

1. muscle weakness-
2. eye
3. anterior 2/3 tongue

8. Vestibulocochlear Nerve
9. **Glossopharyngeal Nerve**

**A. SVA component**

- (inferior or petrossal ganglion IX)
- Taste buds
- Solitary nucleus
- Solitary tract

**B. SVE component**

- Solitary tract
- Nucleus ambiguus
- Stylopharyngeus muscle

**C. GSA component**

- Solitary tract
- (Superior ganglion IX)
- Spinal tract of V
- Spinal nucleus of V
- 1. outer ear
- 2. posterior 1/3 tongue

**D. GVA component**

- Solitary tract
- (Inferior ganglion IX)
- Receptors:
  1. Mechanoreceptors – pharynx, tonsils, palate
  2. Baroreceptors – carotid sinus
  3. Chemoreceptors – carotid body
E. GVE component - parasympathetic

![](image)

F. Prominent signs of damage to c.n.IX

1. reduced gag reflex
2. no taste posterior 1/3 tongue
3. no somatic sensation posterior 1/3 tongue

10. Vagus Nerve

A. SVA component

![Diagram](image)

B. SVE component

![Diagram](image)

C. GSA component

![Diagram](image)
D. GVA component

1. larynx
2. thoracic and abdominal viscera
3. baroreceptors - aortic arch
4. chemoreceptors - aortic bodies

E. GVE component

enteric nervous system
dorsal motor n. X

thoracic and abdominal viscera
peripheral ganglia

F. Prominent symptoms of damage to c.n. X:

1. weak, raspy voice
2. can't cough forcefully
3. during “aahhh” palate pulled toward intact side

11. Spinal Accessory Nerve

A. SVE component

1. trapezius m.
2. sternoclydomastoid m.
B. Signs of damage to c.n. XI

Ipsilateral weakness:

1. elevating ipsilateral shoulder
2. rotating chin away from injured side

12. Hypoglossal Nerve

A. GSE component

B. Signs of damage to c.n. XII:

1. 

2. fasciculations-
3. atrophy-