Reflex Physiology

Reflex Arcs

- Reflex: An involuntary response to a stimulus:
  - Begins with sensory input
  - Ends with motor response
- Reflex Arc is the pathway over which a reflex occurs

Types of Reflex Arcs

- Visceral (autonomic) reflexes e.g. automatic production of saliva upon seeing or smelling food
- Somatic (skeletal) reflexes e.g. movement of a body part in the presence of pain
Somatic Reflexes

- Components of somatic reflex arc
  - Sensory receptor
  - Afferent (sensory) neuron
  - May include one or more interneurons
  - Efferent (motor) neuron
  - Effector (skeletal muscle)

Figure 16.1  Simple reflex arc. Components of all human reflex arcs: receptor, sensory neuron, integrative center, and effector.

Testing Reflexes

- Deep tendon reflexes: Reflex being tested is within the body and a tendon is being stimulated and the result of the action is caused by the muscle associated with that tendon.
- Superficial (cutaneous) reflexes: Stimulus is on the surface of the body.

Figure 16.2  Monosynaptic and polysynaptic reflex arcs. The integrative center is in the spinal cord, and in both arcs the receptor and effector are in the same body part. (a) The monosynaptic reflex, a two-neuron monosynaptic reflex. (b) A flexor reflex, an example of a polysynaptic reflex.
Deep Somatic Reflex Arcs

- Types include:
  - **Stretch reflexes**: are monosynaptic and ipsilateral
  - **Withdrawal** (flexor) reflexes: are polysynaptic and ipsilateral
  - **Crossed extensor reflexes**: are polysynaptic and contralateral

Evaluating Responses

- For Deep Tests:
  - ++++ hyperreaction (probably won't see)
  - +++ strong reaction
  - ++ weak reaction
  - + very weak reaction
  - 0 no reaction

- For Superficial Tests:
  - Give descriptive evaluation

Overriding a Reflex

- Relax when having reflexes tested; try closing eyes during test; What is the effect?
- Try the Jendrassic maneuver when testing leg reflexes; lock fingers and pull laterally; What is the effect?
- When testing arm reflexes try crossing ankles and pulling feet against each other. What is the effect?
Reflex Tests

- **Biceps reflex** tests C5 and C6
- **Triceps reflex** tests C7 and C8
- **Brachioradialis reflex** tests C5 and C6

More Reflex Tests

- **Patellar reflex** tests L2, L3, and L4 tracts
- **Achilles reflex** tests S1 and S2
- **Babinski reflex** tests mostly S1 and S2 but also L4 and L5
- **Glabellar reflex**

End of Exercise