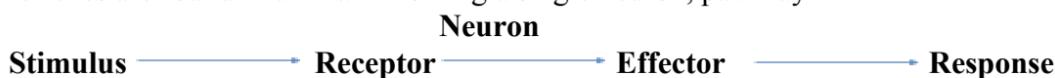


Reflex Action

A **reflex action** is a sympathetic, automatic, involuntary, nerve mediated activity produced at the unconscious level by stimulating specific receptors. It is the process by which sensory impulse is automatically converted into motor effect through central nervous system.

Reflex arc –

The path travelled by an impulse in a reflex action is called as reflex arc. It is formed by the neurons forming the pathway taken by nerve impulses in reflex action. The simplest reflexes are found in animal involving a single neuron, pathway –



Types of reflexes –

1. **Unconditioned reflexes** – These are inborn or inherited reflexes shown by all individuals. These reflexes need no training and are initiated immediately after birth. These are constant and respond to a definite time. For example – baby crying for milk.
 2. **Conditioned reflexes** – These are acquired during the lifetime of an animal through learning or experiences to stimuli. It involves the establishment of new reflex arc. For example – salivation in response to food.
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Based on the involvement of number of nerves, reflexes are of two types –

1. **Monosynaptic reflex** – These are the reflexes in which only one synapse is present between the sensory neuron and motor neuron. For example – stretch reflexes (biceps, triceps).
 2. **Polysynaptic reflex** - This has atleast two synapses situated within the spinal cord. It involves third type of neuron – interneuron. In this, one or more interneurons are present between the sensory neuron and motor neurons. For example – withdrawal reflexes.
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Components of reflex action –

The reflex arc forms the functional unit of nervous system and consists of –

1. **Receptor** – These are present in all organs. It receives the stimulus and set up a sensory impulse.
 2. **Sensory neurons** – These are also known as afferent neurons. It connects the receptor to spinal cord. It carries stimulus from the receptors to spinal cord.
 3. **Interneuron** –These are also called as intermediate neurons or interstitial neurons. These are found in spinal cord. They transfer the impulses from sensory neurons to motor neurons. It forms monosynaptic and polysynaptic reflex arc.
 4. **Motor neuron** – These are also called as efferent neuron, situated within the ventral root of spinal cord. These carry the impulses to effector organs i.e., muscle or a gland.
 5. **Effector** – These are the organs which react and respond to various stimuli received. For example – muscle and glands.
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Mechanism of reflex action –

- The stimulus such as needle prick initiates the pain receptor present in the skin and thus initiates a sensory impulse.
 - Receptor connected to spinal cord through sensory neuron, carries impulses from the receptor to the spinal cord.
 - Sensory neuron passes the impulse to spinal cord by interneuron present in the spinal cord. Sensory neuron synapses with interneuron and thus the impulse travels to spinal cord.
 - Interneuron present in the spinal cord connects sensory neuron and motor neuron. Interneuron in turn synapses with the motor neuron and passes the impulse to it.
 - Motor neuron then transmits the impulse to an effector organ, muscles, causing them to contract and pull away from the sharp object.
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The pathway of reflex action –

