

The Spinal Reflex: The Traditional Physiology

*To watch a brief video explaining the classic physiology of the spinal reflex,
click this link:* 

Conventionally, each spinal reflex is said to possess:

- *An afferent sensory pathway*
- *An efferent motor pathway*

*Typically, the first pathway terminates where the second begins—within the **same spinal segment**. Occasionally, both pathways interface across **adjacent spinal segments** (rostral or caudal).*

- ***Sensory Afferent Pathway:***

*Converges at **sensory neurons** within the **spinal ganglion** of the posterior root (dorsal root) of the spinal nerve.*

- ***Motor Efferent Pathway:***

*Originates from **motor neurons** in the **anterior horn** of the spinal cord.*

So far, I agree with traditional physiology regarding the occurrence of the spinal reflex. Beyond this, my perspectives diverge irrevocably.

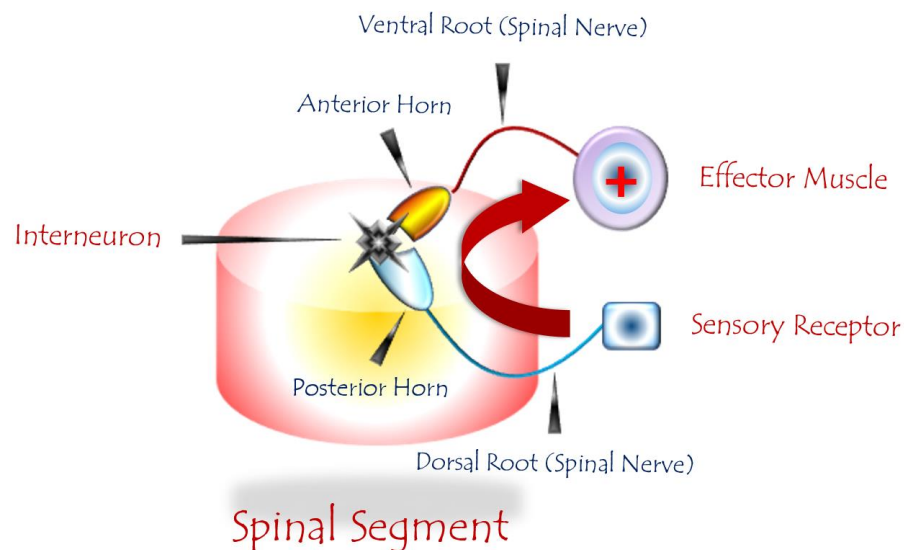
The Traditional Model Asserts:

*Interposed between sensory neurons (SN) and lower motor neurons are **intermediate neurons (interneurons)**. These interneurons relay the **afferent impulse** directly from sensory to motor neurons, thereby completing a functional circuit:*

- *The **Lower Motor Neuron (LMN) Circuit***
- *Equivalently, the **Spinal Reflex Circuit***

Thus, according to this model (see Figure below), the spinal reflex comprises:

- *The sensory neuron (SN)*
- *The lower motor neuron (LMN) (within the same or adjacent segment)*
- *Interneurons bridging them...or so they claim.*



The Spinal Reflex (Traditional Conception)

[To watch a brief video explaining the classic physiology of the spinal reflex, click this link:](#) 

The spinal reflex circuit comprises three elements:

1. Sensory Neuron (SN)
2. Interneuron (Intermediate Neuron)
3. Lower Motor Neuron (LMN)

Neuroanatomical Localization:

<i>Component</i>	<i>Location</i>
<i>Sensory Neuron (SN)</i>	<i>Spinal ganglion of the dorsal root</i>

Interneuron

Posterior horn of the spinal cord

Lower Motor Neuron (LMN)

Anterior horn of the spinal cord

All neural elements reside within **one or two adjacent spinal segments**.

Physiological Sequence (Traditional View):

1. **Sensory input** arrives at the sensory neuron (SN).
2. Excitation is relayed via an **interneuron** to the lower motor neuron (LMN).
3. The sensory input carries a **binding motor command** that mandates execution.
4. LMNs promptly issue motor orders to effector targets.

Role of the Upper Motor Neuron (UMN):

The UMN remains **detached from the decision site**. It merely:

- Monitors reflex activity
- Evaluates reflex performance...without direct engagement in the reflex execution.

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In other contexts, you can also read the following articles:



[The Spinal Reflex, New Hypothesis of Physiology](#)



[The Hyperreflexia, Innovated Pathophysiology](#)



[The Spinal Shock](#)



[The Spinal Injury, the Pathophysiology of the Spinal Shock, the Pathophysiology of the Hyperreflexia](#)



[Upper Motor Neuron Lesions, the Pathophysiology of the Symptomatology](#)



[The Hyperreflexia \(1\), the Pathophysiology of Hyperactivity](#)



[The Hyperreflexia \(2\), the Pathophysiology of Bilateral Responses](#)



[The Hyperreflexia \(3\), the Pathophysiology of Extended Hyperreflex](#)



The Hyperreflexia (4), the Pathophysiology of Multi-Response Hyperreflex



The Clonus, 1st Hypothesis of Pathophysiology



The Clonus, 2nd Hypothesis of Pathophysiology



The Clonus, Two Hypotheses of Pathophysiology



The Nerve Transmission through Neural Fiber, Personal View vs. International View



The Nerve Transmission through Neural Fiber (1), The Action Pressure Waves



The Nerve Transmission through Neural Fiber (2), The Action Potentials



The Nerve Transmission through Neural Fiber (3), The Action Electrical Currents



The Function of Standard Action Potentials & Currents



The Three Phases of Nerve transmission



Neural Conduction in the Synapse (Innovated)



Nodes of Ranvier, the Equalizers



Nodes of Ranvier, the Functions



Nodes of Ranvier, First Function



Nodes of Ranvier, Second Function



Nodes of Ranvier, Third Function



Node of Ranvier, The Anatomy

-  [*The Wallerian Degeneration*](#)
-  [*The Neural Regeneration*](#)
-  [*The Wallerian Degeneration Attacks Motor Axons, While Avoids Sensory Axons*](#)
-  [*The Sensory Receptors*](#)
-  [*Nerve Conduction Study, Wrong Hypothesis is the Origin of the Misinterpretation \(Innovated\)*](#)
-  [*Piriformis Muscle Injection Personal Approach*](#)
-  [*The Philosophy of Pain, Pain Comes First! \(Innovated\)*](#)
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-  [*Carpal Tunnel Syndrome Complicated by Complete Rupture of Median Nerve*](#)
-  [*Biceps Femoris' Long Head Syndrome \(BFLHS\)*](#)
-  [*Barr Body, The Whole Story \(Innovated\)*](#)



[Adam's Rib and Adam's Apple, Two Faces of one Sin](#)



[Adam's Rib, could be the Original Sin?](#)



[Barr Body, the Second Look](#)



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