

<b>Secondary Injury</b>	<b>Description</b>	<b>Pharmaceutical Agent/Treatment Used to Counteract Injury</b>
Inflammation	Swelling at the injury site. Dead cells attract inflammatory cells such as macrophages, neutrophils, and microglia, which in turn release pro-inflammatory cytokines at the site of injury.	<ul style="list-style-type: none"> <li>• Methylprednisolone</li> <li>• Dexamethasone</li> <li>• Minocycline</li> <li>• Erythropoietin</li> <li>• Granulocyte-colony stimulating factor</li> <li>• Cethrin®</li> </ul>
Hemorrhage	Initial injury results in bleeding within the grey matter, which leads to hemorrhagic death of afflicted cells.	<ul style="list-style-type: none"> <li>• Methylprednisolone</li> </ul>
Ischemia	Blood flow is restricted from the spinal cord and surrounding tissues. Hypoxia results in cell death.	<ul style="list-style-type: none"> <li>• Methylprednisolone</li> <li>• Naloxone</li> <li>• Nimodipine</li> <li>• Erythropoietin</li> <li>• Thyrotropin-releasing hormone</li> </ul>
Edema	Swelling and fluid build-up around the spinal cord. Can be the result of initial trauma, ischemia, and excitotoxicity.	<ul style="list-style-type: none"> <li>• Methylprednisolone</li> <li>• Riluzole</li> </ul>
Excitotoxicity	Neuronal damage caused by overstimulation, produced by high levels of calcium ions and glutamate.	<ul style="list-style-type: none"> <li>• Riluzole</li> <li>• Minocycline</li> <li>• Erythropoietin</li> <li>• GM-1 ganglioside</li> <li>• Thyrotropin-releasing hormone</li> </ul>
Lipid peroxidation	Reactive oxygen species steal electrons from neuron cell membranes, resulting in membrane lysis and cell death.	<ul style="list-style-type: none"> <li>• Methylprednisolone</li> <li>• Tirilazad mesylate</li> <li>• Erythropoietin</li> <li>• Minocycline</li> <li>• Riluzole</li> </ul>
Apoptosis	Programmed cell death of neurons due to presence of cytokines and reactive oxygen species.	<ul style="list-style-type: none"> <li>• Methylprednisolone</li> <li>• Erythropoietin</li> <li>• GM-1 ganglioside</li> <li>• Granulocyte-colony stimulating factor</li> <li>• Minocycline</li> </ul>
Axon demyelination	Damaged oligodendrocytes cause demyelination of neurons. Exposed axons are susceptible to damage from reactive oxygen species.	<ul style="list-style-type: none"> <li>• Granulocyte-colony stimulating factor</li> <li>• GM-1 ganglioside</li> <li>• Cethrin®</li> <li>• Erythropoietin</li> </ul>
Neurogenic shock	Normal sympathetic nervous system functioning is disrupted, leading to hypotension and bradycardia.	<ul style="list-style-type: none"> <li>• Established treatments for bradycardia, hypotension, and hypothermia</li> </ul>