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# Facial Nerve Injury

## What is Facial Nerve Injury?

Common causes of facial nerve injury include trauma, compression from a tumor, Bell's palsy, and compromise secondary to inflammation. The facial nerve controls many muscles of the face, including those that control eye closing, smiling, and frowning. Despite the mechanism of injury, compromise of the facial nerve leads to decreased ability of the facial nerve to transmit messages from the brain to the facial muscles. Impaired facial nerve function can lead to facial weakness or paralysis.

Treatment depends on the cause of the facial nerve injury. Imaging, such as computed tomography (CT) and Magnetic Resonance Imaging (MRI) may be performed to localize the site of injury. Additionally, electrodiagnostic tests may be performed to evaluate facial nerve function. A discussion with your physician should take place to determine whether non-conservative treatment (i.e. surgical repair) or conservative treatment (i.e. physical therapy) would be most appropriate. Additionally, since eye closing ability may be affected, lubricating eye drops or eye patches may be prescribed to prevent excessive eye drying and irritation during sleep.

# Pathophysiology

Nerve injuries are classified according to the degree of injury. The following is an overview of the main types of nerve injury:



<b>Neuropraxia</b>	
Mechanism of Injury	Ischemia or compression.
Effect of Injury	Nerve structure remains intact but conduction slows down.
Recovery	Occurs within hours-weeks.
<b>Axonotmesis</b>	
Mechanism of Injury	Crush injury.
Effect of Injury	Axon is disrupted but myelin sheath is intact.
Recovery	Dependent on severity of injury; Motor function may return, but is not guaranteed. Occurs within weeks-months.
<b>Neurotmesis</b>	
Mechanism of Injury	Damage extends through the majority of the nerve
Effect of injury	Decreased nerve conduction.
Recovery	Recovery is uncertain and complete recovery may be rare. It typically takes 6 months to determine if there is any return of function.

## Nerve Recovery and Regeneration

Following injury nerves sprout to recover function. Nerve regeneration occurs at a rate of 1 mm/day. The extent of nerve recovery is dependent on the amount of scarring around the nerve, the proficiency of blood flow around the nerve, and the degree of inflammation.

## Re-training the Facial Nerve

A trained physical therapist may work with you to help you recover muscle function. Your therapist may prescribe you a series of exercises to help maximize facial muscle function recovery.

### General Exercise Principles:

- Slow and small movements to start
- Focus on motor control and coordination
- Use of a mirror to ensure symmetric muscle movements
- **Emphasis on QUALITY of movements, not quantity**

Avoid the use of electrical stimulation during the first 6-12 months. Please consult with a physician.

# Frequently Asked Questions

- **How long should it take to recover?**
  - Most patients should have some recovery within the first 2-4 weeks, however, complete recovery may take up to 6 months. If you have facial paralysis without recovery for more than 6 months you should see a physician immediately.
- **What treatments should I avoid?**
  - Electrical nerve stimulation applied incorrectly or at the wrong time could increase your risk of synkinesis therefore should be avoided.
  - Accupuncture - the current available evidence is insufficient to support that acupuncture is an effective therapy for facial palsy due to the poor quality of research into the area.
- **What is Synkinesis?**
  - Unwanted movement of the facial muscles during voluntary movement.
  - Examples: eye closure with smiling, neck tightening with mouth movement, cheek lifts with eye closure, facial tightness.
- **Who develops Synkinesis?**
  - Everyone who develops facial paralysis will develop some degree of synkinesis. However, the degree will vary from patient to patient. The more severe your facial paralysis is at the onset, the likelier you're your synkinesis will be more noticeable.
- **How do you treat Synkinesis?**
  - Biofeedback and facial re training with a physical therapist
  - Facial massage and stretching
  - Botox can be used to relax overactive or tight muscles. Please consult your physician.

## For more information:

- **USC Facial Nerve Center** -- <http://ent.keckmedicine.org/treatments-services/facial-nerve-center/>
- **Information about Facial Palsy** -- <http://www.facialpalsy.org.uk/inform/what-is-facial-palsy/>
- **Information about Synkinesis** -- <http://www.facialpalsy.org.uk/support/patient-guides/synkinesis-advice/>