# **Upper limb paralysis**

Upper limb paralysis refers to the partial or complete loss of voluntary muscle function in the upper limb, which includes the shoulder girdle, upper arm, forearm, wrist, and hand. This loss of function can result from various causes, such as nerve injuries, spinal cord damage, stroke, or other neurological disorders. Depending on the underlying cause and severity, it may also involve changes in sensation, muscle tone, and reflexes in the affected limb.

# **Upper Limb Paralysis Treatment**

The treatment of **upper limb paralysis** depends on the underlying cause, severity, and whether the condition is **temporary or permanent**. Management typically involves a combination of **medical**, **surgical**, **rehabilitative**, **and assistive approaches**.

#### 1. Identifying & Treating the Underlying Cause

- **Stroke**: Clot-busting drugs (e.g., **tPA** for ischemic stroke), blood pressure control, neurorehabilitation.
- **Spinal Cord Injury**: Surgical decompression, stabilization, corticosteroids (controversial), neurorehabilitation.
- Brachial Plexus Injury: Surgery (nerve grafts, transfers), physical therapy, pain management.
- Peripheral Nerve Injury: Nerve repair, tendon transfers, physiotherapy.
- **Neuromuscular Disorders** (e.g., ALS, MS, GBS): Immunomodulatory therapy (IVIG, steroids, plasma exchange), supportive care.
- Trauma/Fractures: Orthopedic fixation, immobilization, rehabilitation.

## 2. Rehabilitation & Physical Therapy

- Range of Motion (ROM) Exercises: Prevents contractures and joint stiffness.
- Strength Training: Helps recover muscle function when possible.
- Functional Electrical Stimulation (FES): Helps restore movement by stimulating nerves/muscles.
- Mirror Therapy: Beneficial for post-stroke recovery and motor relearning.
- Constraint-Induced Movement Therapy (CIMT): Forces use of the affected limb.

## 3. Surgical & Interventional Treatments

- Nerve Transfers: Transfer of functional nerves to restore movement.
- Tendon Transfers: Re-routing working tendons to compensate for paralysis.

- **Bionic/Robotic Prosthetics**: For severe, irreversible cases.
- Stem Cell Therapy: Experimental but promising in neuroregeneration.
- Cervical spinal cord stimulation: Research-based approach for spinal cord injuries.

#### see Cervical spinal cord stimulation for Upper Limb Paralysis

#### 4. Assistive Devices & Technology

- Orthoses & Splints: Prevent deformities and aid function.
- Exoskeletons & Neuroprosthetics: Assist movement recovery.
- Brain-Computer Interfaces (BCI): Experimental technology for motor function restoration.

#### 5. Medications & Pain Management

- Muscle Relaxants: Baclofen, tizanidine (for spasticity).
- Botulinum Toxin (Botox): Reduces spasticity in stroke or cerebral palsy.
- Pain Control: Gabapentin, pregabalin for neuropathic pain.
- Corticosteroids: Sometimes used for inflammatory causes (e.g., transverse myelitis).

#### 6. Psychological & Social Support

- Cognitive Behavioral Therapy (CBT): Helps with depression, anxiety, and adaptation.
- **Occupational Therapy**: Trains patients in adaptive techniques for daily living.
- **Support Groups**: Encourages coping strategies and community support.

#### Prognosis

- **Mild cases** (e.g., nerve compression, partial stroke recovery) → May regain function with therapy.
- **Moderate cases** (e.g., brachial plexus injuries, incomplete spinal cord injury) → Partial recovery possible.
- Severe cases (e.g., complete spinal cord injury, ALS) → Permanent paralysis but may benefit from assistive technology.

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