

## Quadriplegics - hand surgery

There are approximately 8,000 people with quadriplegia living in Australia. Quadriplegia affects the use of a person's upper limbs and hands. This loss of upper limb function means many people rely on family or carers to help them with basic activities of daily living like eating, showering and writing.

Some people with quadriplegia can achieve a useful grasp that enables them to live more independent lives after a highly specialised surgical procedure called tendon transfer surgery.

### Spinal cord injury

Quadriplegia is paralysis that affects both the upper and lower limbs. It is usually the result of an injury to the spinal cord in the neck that disrupts messages from the brain to the body so that movement and sensation are impaired.

The most common causes of quadriplegia continue to be:

- Vehicle accidents – car, motorbike, bicycle
- Falls
- Diving injuries
- Sports injuries.

### Tendon transfer surgery

Tendon transfer surgery (TTS) is designed to restore function to either the elbow or to the wrist and hand, to improve control of upper limbs and give a functional grasp. TTS moves 'spare' muscles that are under voluntary control and uses them to compensate for paralysed muscles.

Tendon transfer surgery will usually mean a period of reduced mobility and restricted upper limb movement. This increased dependence is temporary, but frustrating and needs to be supported with extra assistance from others.

Tendon transfer surgery will not prevent any benefits from other spinal cord injury treatments. If in doubt about the potential benefit of surgery, ask for a specialised assessment so that you are given accurate information – the decision to go ahead with surgery remains with the individual.

### Elbow tendon transfer surgery

Most quadriplegics retain the ability to move their shoulders. During elbow TTS, the large shoulder muscle (deltoid muscle) is partially detached and grafted to the elbow, using a tendon or Dacron graft. This allows the person to straighten their arm, reproducing the function of their triceps muscle.

This elbow extension may help give more control during transfers, propelling a wheelchair and reaching for objects, and may assist with a return to driving.

### Wrist and hand tendon transfer surgery

Wrist and hand TTS involves re-routing 'spare' forearm muscles that have retained voluntary movement and power, and attaching them to the tendons used to move the wrist, fingers and thumb. Depending on the number of muscles available for transfer, the restoration or improvement of grasp and pinch actions may be possible.

A functional grasp gives people with quadriplegia greater independence by enabling them to complete everyday activities like eating, brushing their teeth, shaving or answering the telephone, with greater control and minimal use of splints or adaptive equipment.

## Other types of upper limb surgery

This type of surgical approach can also be used to treat other issues such as spasticity, contracture and deformity after spinal cord injury, or for conditions such as stroke, brachial plexus lesions and cerebral palsy. Muscles can be released, stretched or re-routed to alter function or position.

This surgery is considered elective surgery and in Victoria is undergone through the Plastic Surgery Unit at Austin Health. Hospital admission is usually only a few days, with the majority of rehabilitation conducted by local practitioners and family members with the support of carers. Private health cover or insurance cover such as TAC will assist the post-op process by financially supporting any need for extra care or equipment.

## Where to get help

- Your doctor
- Your nearest state spinal cord injury service
- Victorian Spinal Cord Service – Austin Health Tel. (03) 9496 5000
- Upper Limb Program VSCS – Austin Health Tel. (03) 9490 7285
- Spinal Cord Injuries Australia Tel. (02) 9661 8855
- AQA Victoria Ltd Tel. (03) 9489 0777
- Spinal Cord Injuries Australia Tel. 1800 819 775
- Independence Australia (formerly ParaQuad Vic.) Tel. 1300 704 456

## Things to remember

- Hand control allows a quadriplegic person to live a more independent life.
- Tendon transfer surgery can restore movement to the elbow, wrist and hand.

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