



# Rehabilitation of complex Injury

NICE guideline [NG211] Published: 18 January 2022

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This guideline covers complex rehabilitation needs after traumatic injury, including assessment and goal setting, rehabilitation plans and programmes, physical, psychological and cognitive rehabilitation, rehabilitation for specific injuries, coordination of rehabilitation in hospital, at discharge and in the community, and commissioning and organising rehabilitation services.

Traumatic injury is any major or minor injury that requires admission to hospital at the time of injury, including musculoskeletal, visceral and nerve injuries, soft tissue damage, spinal injury, limb reconstruction and limb loss.

This guideline includes recommendations on:

- [initial assessment and early interventions for people with complex rehabilitation needs](#)
- [multidisciplinary team rehabilitation needs assessment](#)
- [setting rehabilitation goals](#)
- [developing a rehabilitation plan and making referrals](#)
- [rehabilitation programmes of therapies and treatments](#)
- [principles for sharing information and involving family and carers](#)
- [coordination of rehabilitation care in hospital](#)
- [coordination of rehabilitation care at discharge](#)
- [supporting access and participation in education, work and community \(adjustment and goal settings\)](#)
- [commissioning and organisation of rehabilitation services](#)

Rehabilitation therapies and interventions:

- [physical rehabilitation](#)
- [cognitive rehabilitation](#)
- [psychological rehabilitation](#)

## Head injury

Quality standard [QS74] Published: 23 October 2014

[Head injury \(nice.org.uk\)](https://www.nice.org.uk/guidance/qs74)

### Why this quality standard is needed

Head injury is any trauma (external force) to the head other than superficial injuries to the face. [NICE's guideline on head injury](#) notes that it is the most common cause of death and disability in people aged 1 to 40 years in the UK. The guideline also reports that 1.4 million people per year attend accident and emergency departments in England and Wales with a recent head injury and that 33% to 50% of these are children and young people aged under 15 years.

Most people recover from head injury without specific or specialist intervention, but others experience long-term disability or even die from complications that could be minimised or avoided with early detection and appropriate treatment. Early detection and rapid treatment is therefore vital for minimising the risk of disability and saving lives.

Emergency departments see many people with minor head injuries and need to identify the very small number of people with head injuries who will go on to have serious acute intracranial complications. CT scanning is the primary imaging modality for assessing head injury. Admission to a specialist centre may be needed for continued observation and surgical intervention.

The quality standard is expected to contribute to improvements in the following outcomes:

- mortality after head injury
- recovery after head injury.

## Quality statement

People who are in hospital with new cognitive, communicative, emotional, behavioural or physical difficulties that continue 72 hours after a traumatic brain injury have an assessment for inpatient rehabilitation.

## Rationale

Rehabilitation enables people with traumatic brain injuries to reach and maintain optimal functioning levels in areas such as intellect, sensory, physical and social behaviour.

Traumatic brain injuries can affect many aspects of a person's life; therefore, it is important to assess the benefits of inpatient rehabilitation.

# Trauma

Quality standard [QS166]Published: 29 March 2018

[Quality statement 6: Specialist services | Trauma | Quality standards | NICE](#)

## Quality statement

Major trauma centres have acute specialist services for rehabilitation after major trauma, and for children and older people.

## Rationale

People with major trauma might need input from specialist services, but access and provision of these services varies between major trauma centres. This can mean that there are delays in treatment and suboptimal outcomes for the person. Ensuring that major trauma centres provide all the specialist services that a patient might need can reduce length of hospital stay, lower mortality and improve patient experience.

# Spinal trauma bracing

**Injury C3-C6:** semirigid collar

**Injury C3-T4:** CTO

**Injury C3-T8:** CTLSO

**Injury T8-S1:** TLSO

The level of stability and brace required should be discussed with the spinal team

## Trauma

[Quality statement 4: Assessment for cervical spine injury | Trauma | Quality standards](#)

Quality standard [QS166] Published: 29 March 2018

Quality statement 4: Assessment for cervical spine injury

### Canadian C-spine rule

The person with suspected spine injury should be assessed as having high, low or no risk of cervical spine injury using the following rule:

- the person is at high risk if they have at least one of the following high-risk factors:
  - age 65 years or older
  - dangerous mechanism of injury (fall from a height of greater than 1 metre or 5 steps, axial load to the head – for example diving,

high-speed motor vehicle collision, rollover motor accident, ejection from a motor vehicle, accident involving motorised recreational vehicles, bicycle collision, horse riding accidents)

- paraesthesia in the upper or lower limbs
- the person is at low risk if they have no high-risk features and at least one of the following low-risk factors:
  - involved in a minor rear-end motor vehicle collision
  - comfortable in a sitting position
  - ambulatory at any time since the injury
  - no midline cervical spine tenderness
  - delayed onset of neck pain
- the person remains at low risk if they are:
  - unable to actively rotate their neck 45 degrees to the left and right (the range of the neck can only be assessed safely if the person is at low risk and there are no high-risk factors).
- the person has no risk if they:
  - have one of the above low-risk factors and
  - are able to actively rotate their neck 45 degrees to the left and right.

Applying the Canadian C-spine rule to children is difficult and the child's developmental stage should be taken into account. [Expert opinion and [NICE's guideline on spinal injury: assessment and initial management](#), recommendations 1.1.5 and 1.1.6]

Once deemed necessary – the patient should be placed into a semirigid collar. There are several different types available and each one has its merits. Currently the trauma Network advocates for either a Miami J or Aspen collar (either universal/ adjustable or a “sized” collar) Which one to use will depend on fit, experience and preference of practitioner applying the collar.

# Collars

[Miami J Select | Cervical Collar | Neck Brace | Össur UK \(ossur.com\)](#)



## Miami J Select







A cervical collar (or c-collar for short) is worn where gross immobilisation of the spine is required, specifically C2 to C5.

## Miami J Select Competency Course

The Miami J Select Cervical Collar Competency Course is available to healthcare professionals 24/7. Instruction on the neck brace includes sizing, adjustability, locking the height in place, fitting, adjustments, cleaning and skin care. Accessory products such as Occian Back and the JTO are also included.

The OSSUR website has fitting videos for patients and practitioners – see link above.



<b>200S</b> <i>Super Short/ Kyphotic</i>	<b>200L</b> <i>Stout</i>	<b>250</b> <i>Extra Small</i>
Kyphotic neck	Very large neck circumference	Very short, thin neck
		
<b>500</b> <i>Tall</i>	<b>400</b> <i>Regular</i>	<b>300</b> <i>Short</i>
Long, tall neck	Most female patients	All other adults
		

Miami J collar – not universal, needs sizing by recognising patient type and fitting the appropriate collar. The OSSUR website has competency course for practitioners – see link above.

Aspen Collar – not a universal collar and requires sizing.

[Aspen Cervical Collar with Replacement Pads — Promedics Orthopaedics](#)

**The Aspen Advantage Symbol**  
An Innovative Feature Available only from Aspen



**Gentle On Skin**  
The pads are made of breathable, open cell foam with a soft, hypoallergenic cotton lining which aids in keeping the skin clean, cool and comfortable.



**Minimizing Skin Breakdown**  
Patented FlexTabs, offer motion restriction while dispersing pressure to help eliminate skin breakdown.



**Occipital Support Strap**  
Adjusts to the patient's occiput, helping to reduce localized pressure.



**CTO Option**  
Using the Aspen Cervical Collar, the Aspen CTO provides substantial control in all three planes of motion.





The Aspen Vista is an adjustable collar.



[Vista Cervical Collar with Replacement Pads — Promedics Orthopaedics](#)

The Promedics website – see link above, has instruction guidelines and application guidelines to help.

[Promedics Orthopaedic - YouTube](#)

There are YouTube videos to help with application in lying and sitting.

## TISO – thoraco-lumbar-sacral -orthosis

The links below are for the Donjoy Back Brace II

[DonJoy Back Brace II - TLSO - Patient Instruction Video - Bing video](#)

[DonJoy Back Brace II TLSO | DJO Global](#) – this contains instruction guidelines, fitting and specification.

This brace provides stability from T6 to Sacrum – although only researched from T8. There are several on the market which all give the same stability. Currently, most trauma units are using the Donjoy Back Brace II. There are other brands which offer a universal brace – fully adjustable for different sizes and body shapes. It is the practitioner’s preference as to which brace is used.



## CTO – cervical-thoracic orthosis



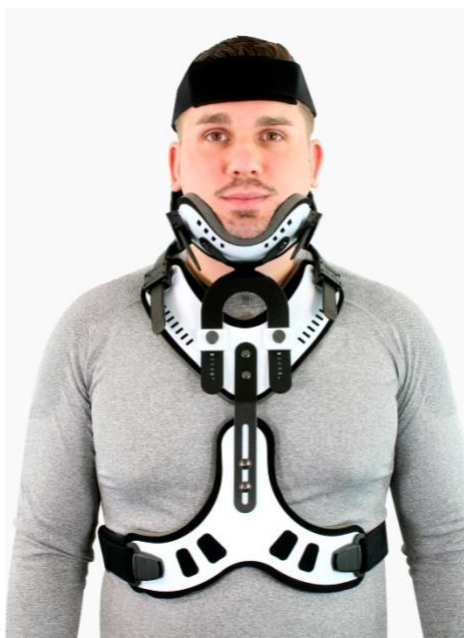
### Cervical-thoracic brace

Indicated for lower cervical and upper thoracic stability

[Össur. Life Without Limitations. \(ossur.com\)](https://www.ossur.com)

OSSUR offers a thoracic extension to the Miami J collar to give stability from C3-T4

Their website provides instruction leaflets and specification guidelines.



Beagle orthopaedics also offer a CTO in 2 sizes S/M and L/XL. Details can be found on their website – link below.

[Bea-CTO - immobilisation & treatment for the upper thoracic & cervical spine. \(beagleorthopaedic.com\)](https://www.beagleorthopaedic.com)

# Cervical-thoracic-lumbar-sacral orthosis

Injuries that involve C3-T8 will require a CTLSO

These braces are usually custom made and are available from companies such as Beagle

## CTLSO Combo Specification Sheet

A customised option to provide maximum support for high thoracic control



## CUSTOM FABRICATION

california soft female sizing information					
size	chest circ (mm)	waist circ (mm)	hip circ	standard model no	tick to Select
X-small	660 - 760	550 - 660	760 - 860	B/3299	<input type="checkbox"/>
small	710 - 810	600 - 710	810 - 910	B/3300	<input type="checkbox"/>
medium	780 - 880	680 - 780	880 - 990	B/3301	<input type="checkbox"/>
large	830 - 990	760 - 910	930 - 1090	B/3302	<input type="checkbox"/>
X-large	930 - 1090	880 - 1040	1040 - 1190	B/3303	<input type="checkbox"/>
XX-large	1040 - 1190	1010 - 1160	1040 - 1190	B/3304*	<input type="checkbox"/>
XXX-large	1140 - 1290	1140 - 1290	1240 - 1390	B/3305*	<input type="checkbox"/>

optional component	
Posterior Thoracic Ext	tick to select
B/PTE	<input type="checkbox"/>

california soft male sizing information					
size	chest circ (mm)	waist circ (mm)	hip circ	standard model no	tick to select
X-small	810 - 910	710 - 810	830 - 930	B/3306	<input type="checkbox"/>
small	860 - 960	760 - 860	880 - 990	B/3307	<input type="checkbox"/>
medium	930 - 1040	830 - 930	960 - 1060	B/3308	<input type="checkbox"/>
large	990 - 1140	910 - 1060	1010 - 1160	B/3309	<input type="checkbox"/>
X-large	1090 - 1240	1040 - 1190	1110 - 1270	B/3310	<input type="checkbox"/>
XX-large	1190 - 1340	1160 - 1320	1210 - 1370	B/3311*	<input type="checkbox"/>

sizing information		
size	chin to shoulder depth (mm)	tick to select
short	57	<input type="checkbox"/>
regular	76	<input type="checkbox"/>
tall	96	<input type="checkbox"/>
extra tall	114	<input type="checkbox"/>

Please provide chin to waist measurement

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