

08

Rehabilitation

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Purpose of guidance

By the very nature of rehabilitation, incorporating guidelines into a manual of operations and procedures is challenging. It is therefore not the intention of this rehabilitation section to provide comprehensive guidance on all aspects of the myriad of rehabilitation interventions that major trauma patients may need. Rather, it is intended to provide an overview of the key rehabilitation processes that will be required and the key rehabilitation themes that will need to be considered during the in-patient phase of the major trauma pathway. This will guide the reader to consider the broader aspects of the rehabilitation of the trauma patient and to seek help and guidance through the Network Co-ordination Service (NCS) where necessary.

A toolbox of assessment tools and outcome measures has also been provided (see separate manual) to aid patient management and to help to demonstrate improved outcomes for this patient population following the advent of the Trauma Network.

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International Classification of Functioning, Disability and Health Framework (ICF)

The original classification of impairment, disability and handicap by the World Health Organisation (1980) informs the basis for an understanding of rehabilitation. This was updated in 1997, with the aim of making the tool more capable for use in different countries and cultures, and more acceptable to different sociological and health-care disciplines. The ICF is based on the classification of health and health-related domains, and helps describe changes in body structure and function. It describes what a person with a health condition can do in a standard environment (capacity), and what they actually do in their usual environment (performance). It also takes into consideration contextual factors (both environmental and personal), the description of an individual's functioning is more complete.

ICIDH – (1980)		ICF (1997)
Impairment	stayed	Impairment
Disability	became	Activity
Handicap	became	Participation

Impairment

- loss or abnormality of a body structure or of a physiological or psychological function

Activity

- 'nature and extent of functioning at the level of the person. Activities may be limited in nature, duration and quality'
- concentrates on **doing**

Participation

- 'is the nature and extent of a person's involvement in life situations in relation to impairments, activities, health conditions and contextual factors'
- concentrates on **being**
- shifts from emphasising people's disabilities to their level of health
- acknowledges that every human being can experience a decrement in health and therefore experience some disability
- thereby 'mainstreams' experience of disability as a universal human experience

International Classification of Diseases (ICD-10) and ICF

- ICD-10 & ICF are complementary
- ICD-10 is mainly used to classify causes of death
- ICF classifies health

References

Halbertsma J, Heerkens YF, Hirs WM, 'Towards a new ICIDH: International Classification of Impairments, Disabilities and Handicaps', *Disability and Rehabilitation* (2000); 22:144–56

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08.a • Goal setting

Patient-centred goal-planning is at the centre of rehabilitation. Goal-planning is a recognised and effective way to plan, direct and measure the success of a rehabilitation programme.

Goals should be **SMART**

- S** specific
- M** measurable
- A** achievable
- R** relevant
- T** time-limited

Goals can be both short and long term and should be set at the level of whole team intervention as well as for the individual clinician.

Failure to achieve a goal should be categorised under one of the following variance headings:

1. patient factors (eg. patient unwell)
2. staff factors (eg. staff sickness)
3. reasons due to intrinsic system factors (eg. equipment failure)
4. reasons due to extrinsic factors (eg. funding)

Examples of goals setting for a patient with a brain injury

Date	SMART goal	Target date	Outcome	Variance
03/03/2012	For John to walk 10m with assistance 1 of plus handling belt in <25 seconds	10/03/2012	Achieved	
03/03/2012	For John to initiate using call bell to ask for help with toileting and remain continent during day on 7/14 days	17/03/2012	Not achieved	Patient factors – intercurrent UTI

References

Royal College of Physicians and British Society of Rehabilitation Medicine, *Rehabilitation following acquired brain injury: national clinical guidelines*, (Turner-Stokes L, ed) London: RCP, BSRM (2003)

'Writing SMART rehabilitation goals and achieving goal attainment scaling: a practical guide', Bovend'Eerd TJ, Botell RE, Wade DT, *Clinical Rehabilitation* (2009) Apr; 23 (4): 352–61

08.b • Mental Capacity Act 2005

Assessment of mental capacity

The underlying philosophy of the Mental Capacity Act (MCA) is to ensure that those who lack capacity are empowered to make as many decisions for themselves as possible and that any decision made, or action taken, on their behalf is made in their best interests.

The five key principles of the Act are:

1. Every adult has the right to make his or her own decisions and must be assumed to have capacity to make them unless it is proved otherwise.
2. A person must be given all practicable help before anyone treats them as not being able to make their own decisions.
3. Just because an individual makes what might be seen as an unwise decision, they should not be treated as lacking capacity to make that decision.
4. Anything done or any decision made on behalf of a person who lacks capacity must be done in their best interests.
5. Anything done for or on behalf of a person who lacks capacity should be the least restrictive of their basic rights and freedoms.

Assessing mental capacity

Four point test of capacity – the person must be able to:

1. understand the information given to them
2. retain the information long enough to be able to make a decision
3. weigh up the information available to make a decision
4. communicate their decision

Best interests

If a person is deemed to not have capacity to make a decision regarding their health and welfare, a decision can be made on their behalf in their 'best interests' except regarding the following circumstances:

- marriage or civil partnership
- divorce
- sexual relationships
- adoption
- voting

The statutory checklist must be consulted. Decisions can be made on the basis of weighing up the advantages and disadvantages of the issue in question, eg. transfer to a specialised rehabilitation facility under the headings of medical, emotional and welfare pros and cons.

08.b • Mental Capacity Act 2005

Independent Mental Capacity Advocate (IMCA)

In cases where a patient has no one to support them with major decisions an IMCA can be appointed. An IMCA will only be involved in specific circumstances:

1. Where the decision is about serious medical treatment provided by the NHS.
2. Where it is proposed that the person is moved into long-term care involving more than 28 days in hospital (eg. transfer to a spinal injuries unit) or eight weeks in a care home.
3. Where a long term move (more than eight weeks) to different accommodation is proposed, such as care home or nursing home.

Court of Protection

It is essential to check if a patient has a pre-arranged Lasting Power of Attorney under the Court of Protection. These can be for property and affairs and for personal welfare. A Deputy can be appointed to an individual after capacity has been lost through application to the Court of Protection.

Deprivation of Liberty Safeguards (DOLS)

These provide a legal framework to prevent unlawful deprivation of liberty occurring.

The Mental Capacity Act (MCA) DOLs apply to anyone:

- aged 18 and over
- who suffers from a mental disorder or disability of the mind such as dementia, a profound learning disability or brain injury
- who lacks the capacity to give informed consent to the arrangements made for their care and/or treatment
- for whom deprivation of liberty (within the meaning of Article 5 of the European Convention on Human Rights) is considered after an independent assessment to be necessary in their best interests to protect them from harm

The safeguards cover patients in hospitals, and people in care homes registered under the Care Standards Act 2000, whether placed under public or private arrangements.

The aim is to ensure people can be given the care they need in the least restrictive regimes whilst safeguarding their rights.

One likely scenario when Deprivation of Liberty Safeguards may need to be considered would be in the case of a wandering patient in post traumatic amnesia requiring environmental restraint to prevent harm.

Advance decisions to refuse treatment

An advance decision allows an individual to set out particular types of treatment they do not want should they lack the capacity to decide this for themselves in the future. Advance decisions are legally binding and must be followed by doctors and other health professionals, as long as they meet certain conditions. At the time that the decision is made the person must be over 18 and have the mental capacity to make such a decision. The documents should make clear which treatments are being refused and the document should explain which circumstances the refusal refers to. The doctor needs this information to decide whether an advance decision is valid and applicable to a particular treatment.

References

Mental Capacity Act 2005

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08.c • Traumatic brain injury (TBI)

In civilian life, the vast majority of head injuries are due to acceleration / deceleration forces resulting in closed head injuries. Risk factors for sustaining a head injury include male sex, younger age (peak 15–24 years with a secondary peak in the elderly) alcohol, lower socioeconomic status and a history of psychiatric disorder. The sequelae of head injury are often long-term and can be profound, with significant psycho-social and socio-economic consequences. Early, appropriate rehabilitation provides the opportunity to actively manage the consequences of the primary brain injury and reduce secondary complications thereby improving outcome.

MDT: Inpatient clinical management considerations (acute phase)

- optimisation of respiratory function
- nutrition, hydration and swallowing
- 24 hour postural management (incorporating pressure care and spasticity management)
- heterotopic ossification
- pain management
- bladder and bowel management
- communication
- the potential for autonomic storming (also known as paroxysmal autonomic instability with dystonia (PAID))
- management of prolonged disorders of consciousness
- management of cognitive and neuro-psychiatric issues including
 - post traumatic amnesia (inability to lay down new memories)
 - executive dysfunction
 - agitation and aggression
 - disorientation and wandering
 - disinhibition
- assessment under the Mental Capacity Act / Deprivation of Liberty safeguards
- family and carer support

Other actions:

- Communication can be made with the trauma rehabilitation co-ordinator for advice and information.
- Refer to the Directory of Services to provide guidance on potential transfer of care options. Patients with severe injuries are likely to require Level 1 specialised rehabilitation services.

Outcome measures/ assessment tools

- Rancho Los Amigos levels of cognitive functioning
- Rehabilitation Complexity Score Extended
- Glasgow Coma Score
- Glasgow Outcome Scale Extended
- Barthel ADL Index
- Northwick Park Dependency Score

References

Head injury triage, assessment, investigation and early management of head injury in infants, children and adults (NICE, 2007)

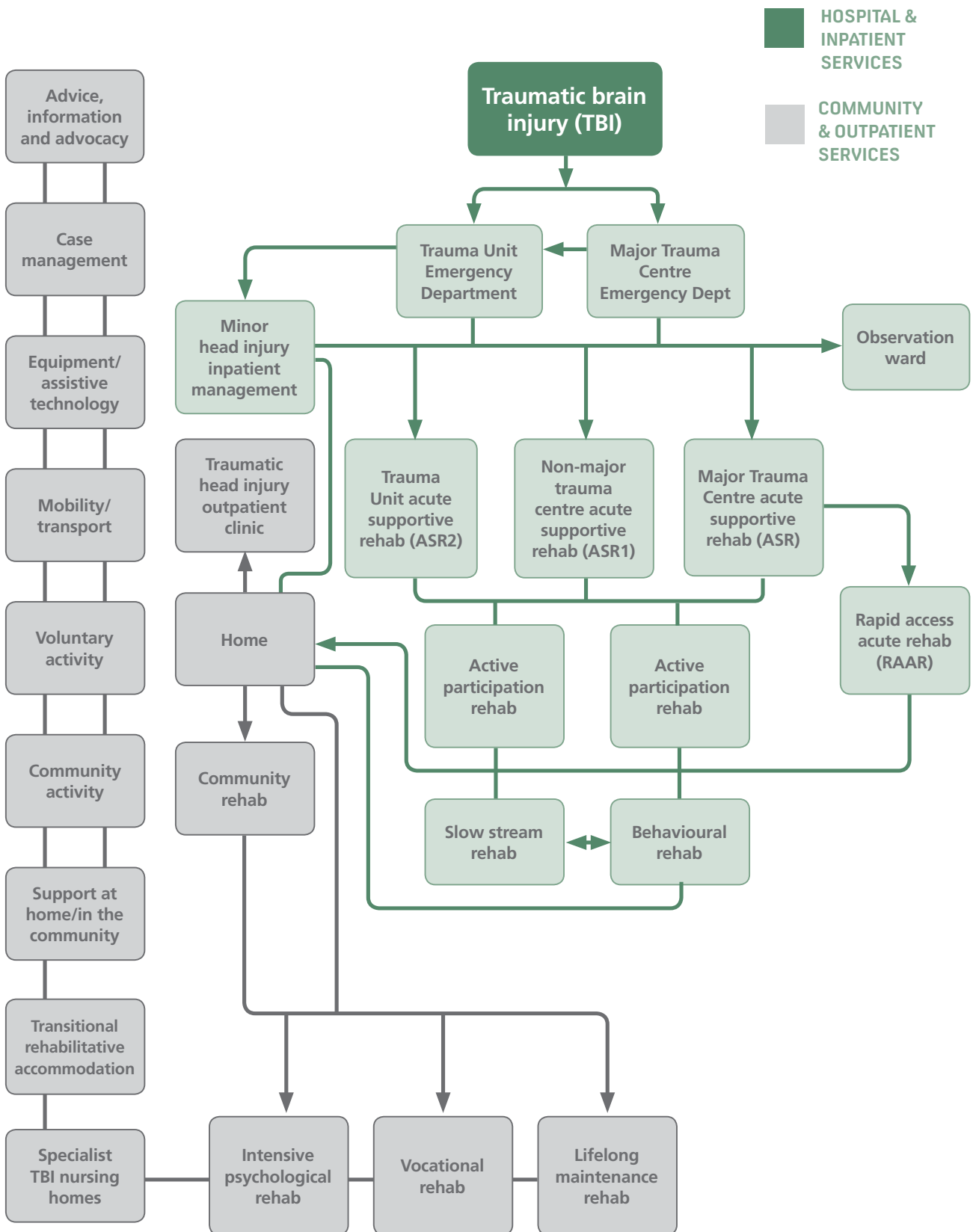
Royal College of Physicians and British Society of Rehabilitation Medicine, *Rehabilitation following acquired brain injury: national clinical guidelines*, (Turner-Stokes L, ed) London: RCP, BSRM (2003)

Early management of patients with a head injury: a national clinical guideline (SIGN, 2009)

Guidelines for the Management of Severe Traumatic Brain Injury, 3rd edn (Brain Trauma Foundation et al, 2007)

08.c.i • Traumatic brain injury (TBI)

Pathway



Based on the model developed by the Eastern Head Injury Group; Pickard, Seeley, Kirker et al, *Journal of the Royal Society of Medicine* (August 2004)

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Traumatic brain injury

08.c.ii • Post traumatic seizures

A post traumatic seizure (PTS) refers to an initial or recurrent seizure episode, not attributable to another obvious cause, after penetrating or non-penetrating traumatic brain injury (TBI).

Post traumatic epilepsy refers to recurrent late seizure episodes, not attributable to another cause.

Immediate: within 24 hours

Early: within seven days

Late: after seven days

Risk factors

- Glasgow Coma Scale score of < 10
- cortical contusion
- depressed skull fracture
- epidural haematoma
- intracerebral haematoma
- wounds with dural penetration
- seizure within the first week of injury
- prolonged length of coma
- prolonged length of post traumatic amnesia

Risk of seizures is greatest in the first two years following TBI, with 80% occurring within this timeframe. The risk of PTS decreases with time and reaches the normal value for the population at around five years post injury.

Incidence

- 5% to 7% of all hospitalized patients with TBI
- 11% of patients with severe non-penetrating TBI
- up to 35% to 50% of patients with penetrating TBI

Suggested, evidence-based approach

- Anti epileptic drugs (AED) to be prescribed during first seven days following TBI for the prevention of early seizure (eg. phenytoin, carbamazepine).
- In patients with no seizures or seizures in the first 48 hours only, withdraw AED after seven days.
- Always anticipate the development of seizures by having appropriate emergency treatment written up on drug chart (eg. buccal midazolam).
- If late seizures develop, treat with appropriate AED.

Rehabilitation considerations

- commonly used AEDs (phenytoin, carbamazepine, valproate) may all impair cognitive function especially memory
- side-effect profiles differ between different drugs
- check AEDs stopped after seven days when appropriate
- seizure management education for patient, family and carers
- DVLA advice

References

Royal College of Physicians and British Society of Rehabilitation Medicine, *Rehabilitation following acquired brain injury: national clinical guidelines*, (Turner-Stokes L, ed) London: RCP, BSRM (2003)

Brain Injury Special Interest Group of the American Academy of Physical Medicine and Rehabilitation, 'Practice parameter: antiepileptic drug treatment of posttraumatic seizures', *Arch Phys Med Rehabil* (1998); 79: 594–597

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Traumatic brain injury

08.c.iii • Autonomic storming (paroxysmal autonomic instability with dystonia (PAID))

15–33% of patients following severe traumatic brain injury (GCS 8 or less) can develop an exaggerated stress response which goes by many names in the literature such as dysautonomia, paroxysmal autonomic instability with dystonia, autonomic dysfunction syndrome and diencephalic seizures. All refer to the sequelae of an over-active, under-inhibited sympathetic nervous system. The exact pathophysiology is unknown, but there is an imbalance or disassociation between the sympathetic and parasympathetic nervous systems. The incidence of sympathetic storming appears to be greater in patients with diffuse axonal injury and brain stem injury.

Clinical diagnosis

Various diagnostic criteria exist but Blackman et al (2005) include:

- temperature of 38.5°C or greater
- hypertension
- tachycardia > 130bpm
- respiratory rate > 40 breaths per minute
- intermittent agitation
- diaphoresis
- dystonia

These features need to occur for at least three days with at least one cycle per day for a diagnosis to be made and not all of these symptoms may occur. Episodes are often unprovoked, but can be precipitated by routine care tasks, eg. turning and suctioning. Early episodes may be masked by sedation or the use of paralysing drugs. Autonomic storming occurs with a mean duration of 74 days post injury, hence it may happen after transfer outside of critical care and in a rehabilitation setting.

Adverse effects

There is a risk of secondary brain insult from the widespread effects of untreated sympathetic storming, including hypertension, cerebral hypoxia, hyperglycaemia, hyperthermia, arrhythmias, hypernatraemia and rhabdomyolysis.

Clinical management

Treatment is symptomatic. As with many other brain injury related conditions, the symptoms are treated independently, and there is no specific treatment of the underlying cause (neural damage).

Due to the wide array of neurotransmitters that are involved in the management of the sympathetic nervous system, a wide array of medications that impact upon those neurotransmitters may be useful. Opiate receptor agonists, dopamine agonists, beta-blockers, alpha blockers, GABA agonists and sedatives are all used. The NCCU staff will be well versed in treating this condition and can offer advice for patients outside the NCCU setting.

Educating and supporting the patient's family is very important as these events look very alarming and they may fear that an irreversible deterioration has taken place.

References

Kishner S (undated), *Post Head Injury Autonomic Complications*, [on-line] <http://emedicine.medscape.com/article/325994-overview>

Lemke DM, 'Sympathetic storming after severe traumatic brain injury', *Crit Care Nurse* (2007); 27: 30–37

Baguley JJ, Cameron ID, Green AM, Slew-Youman S, Marosszeky JE, Gurka JA, 'Pharmacological management of dysautonomia following traumatic brain injury', *Brain Injury* (2004); 18: 409–417

Blackman JA, Patrick PD, Buck ML, Rust RS, 'Paroxysmal autonomic instability with dystonia after brain injury', *Arch Neurol* (2005); 61: 321–328

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Traumatic brain injury

08.c.iv • Disorders of consciousness (DOC)

After severe traumatic brain injury a small number of patients fail to wake up despite withdrawal of sedation. Rarely, they may be in a persistent coma, or be locked in. Others (6% of those admitted with severe TBI in one study from 1970s) develop a prolonged disorder of consciousness where there is wakefulness without awareness. This has been described as a **vegetative state** (Jennet and Plum, 1972); this term has replaced 'apallic syndrome, total dementia, akinetic mutism'. To make this diagnosis, any persisting effects of medication, metabolic disturbance, or other complications such as hydrocephalus have to be excluded and the patient should be assessed repeatedly by clinicians experienced in managing patients with this condition.

Patients in a vegetative state (VS) demonstrate:

- sleep wake cycle
- 'no evidence of awareness of self or environment at any time'
- no responses to visual, auditory, or noxious stimuli 'of a kind suggesting volition or conscious purpose'
- no evidence of language comprehension or meaningful expression

The minimally conscious state (MCS)

Some patients will demonstrate severely altered consciousness but have some very limited awareness where there is minimal but definite behavioural evidence of self or environment. This condition was first described as the **minimally conscious state** by Giacino in 2002.

Before making any diagnosis of VS or MCS it is imperative to exclude reversible causes of the lack of behavioural response to environmental stimuli.

Assessment should be repeated on several occasions and include a thorough neurological as well as general examination looking for signs of raised intracranial pressure or infection, paying particular attention to eye movements, blink responses to visual threat, other cranial nerves and checking spinal reflexes to ensure there is no critical illness neuropathy or spinal cord injury preventing peripheral responses.

Investigations

These will be guided by the history and management to date but might include:

- repeat CT brain scan to exclude hydrocephalus or re-bleeding or rarer problems such as 'syndrome of the trephined'
- MRI of the brain may show areas of diffuse axonal injury and brain stem damage more clearly
- EEG to exclude subclinical seizures
- bloods to exclude hypercapnia, hypoglycaemia, hyponatraemia, hypopituitarism

Management

The same management principles apply to this patient group as they do with any other unconscious patient. The key additional point to emphasise to staff is that the patient **may be able to understand them**. Optimal postural and pain management is also crucial (both in long term but also before confirming a diagnosis of VS). Patients are often more responsive when sat out but may need gradual adjustment to achieve this over many weeks.

References

The Vegetative State: guidance on diagnosis and management, Report of a working party of the Royal College of Physicians (2003), (currently being reviewed by a joint working party for the British Society of Rehabilitation Medicine and RCP)

Giacino JT, Ashwal S, Childs N, Cranford R, Jennett B, Katz DI, Kelly JP, Rosenberg JH, Whyte J, Zafonte RD and Zasler ND, 'The minimally conscious state: Definition and diagnostic criteria', *Neurology* (2002); 58 (3): 349–353

Shiel A, Horn S, Wilson BA, McLellan DL, Watson M and Campbell M, 'The Wessex Head Injury Matrix main scale: A preliminary report on a scale to assess and monitor patients recovery after severe head injury', *Clinical Rehabil* (2000); 14: 408–416

Western Neuro Sensory Stimulation Profile (WNSSP)

Gill-Thwaites H, 'The Sensory Modality Assessment Rehabilitation Technique – a tool for Assessment and treatment of patients with severe brain injury in a vegetative state', *Brain Injury* (1997); 11 (10): 723–734

Assessment of the disorder of consciousness

Before assessing a person's level of awareness the following should be considered:

- effect of sedating drugs, eg. baclofen – this patient group is generally more sensitive to the sedative effects of drugs so any sedating agent should be slowly withdrawn if possible before diagnostically labelling the person as in a vegetative state.
- effect of fatigue – people with a DOC fatigue very rapidly during assessment so these need to be kept short, eg. limited to 10–15 minutes only to ensure potential responses are not affected by fatigue.

After specialist assessment and with specialist monitoring it may be helpful to consider a trial of alerting medication such as modafinil although there is limited evidence for long term benefit to date.

Measuring any change

Systematic assessment of the patient's change in response to a range of stimuli is facilitated through the use of a range of formal measures which are designed to pick up small but meaningful differences that might denote an improvement in the patient's level of consciousness over time.

1. Coma Recovery Score (CRS) (Giacino et al, 2002)
most straight forward and useable by whole team
2. Wessex head injury matrix. (WHIM) (Shiel et al,2000)
 - documents recovery from coma to end of PTA
 - correlates with FIM/FAM
 - observed or elicited behaviours
 - training required
3. Sensory, modality assessment rehabilitation technique (SMART) assessment (Gill-Thwaites et al, 1997)
 - ten repeated detailed assessments of reactions to sensory stimuli in many domains over a period of three weeks
 - training required

Research tools

Various research groups have designed Functional MRI (fMRI) and electrophysiological paradigms to explore whether this group of patients have any covert awareness but none of these is ready for widespread clinical use at present.

Prognosis

It is best to avoid being drawn in to making firm predictions about recovery in the first few months as there are few reliable predictors of outcome other than age. While the prognosis is grave with very few recovering to full independence it is worth considering that a number of European studies have documented up to 20% significant recovery including return to work in cohorts of patients described as in a vegetative state at one month post injury. A report by a multi society task force in the USA has indicated that if a person remains in a vegetative state after four years then the mean survival is 12.5 years.

Further discussions with the family including withdrawal of artificial nutrition and hydration are beyond the scope of this manual and should only be embarked upon if the family request it; once there is no further sign of change; once all the treatable causes have been actively excluded; and after a full assessment has been completed by experienced clinicians.

The timing of such discussion remains debateable but current RCP guidelines indicate that in England it is not appropriate to consider for at least 12 months after traumatic brain injury and that it is a matter for the High Court to advise on every such case where withdrawal of artificial nutrition and hydration is being considered. If an advance directive has been made this should be discussed with the family and the hospital legal team to ensure that it is valid in the circumstances before acting as it directs.

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Traumatic brain injury

08.c.v • Mood and cognition assessment

Assessment of cognitive function in a patient with brain injury is essential and will need repeating as recovery occurs. All members of the multi-disciplinary team should be able to perform basic cognitive assessment as this will inform the approach to the rehabilitation of the patient.

Clinical management issues to consider

- Assess the patient in a quiet area, preferably after a period of rest, away from distractions.
- Take into account drugs that may affect cognitive functioning, eg. opiates, anticholinergic drugs (eg. bladder stabilisers such as oxybutinin), anti-epileptic drugs.
- establish pre-morbid handedness
- establish pre-morbid functioning
- assess for post-traumatic amnesia
- assess for post traumatic stress disorder

Cognitive domains to assess:

- memory
- attention and concentration
- speech, language and communication skills
- visuospatial and constructional skills
- executive functioning
- mood, personality and behaviour

For a more comprehensive assessment of mood and cognition refer to psychology.

Outcome measures/ assessment tools

- Addenbrooke's Cognitive Examination – 111

References

Royal College of Physicians and British Society of Rehabilitation Medicine, *Rehabilitation following acquired brain injury: national clinical guidelines*, (Turner-Stokes L, ed) London: RCP, BSRM (2003)

'Biopsychosocial approaches in neurorehabilitation: Assessment and management of neuropsychiatric, mood and behavioural disorders', *Neuropsychol Rehabil* (2003); 13 (4)

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Traumatic brain injury

08.c.vi • Behavioural management guidelines

These guidelines are intended to provide useful information for staff working with patients who have cognitive deficits and who may present with challenging behaviour. Staff should find them particularly helpful for patients in the first few weeks of their admission to the ward, when problems are more severe. They are designed to provide useful background information to help staff understand the patient's difficulties and behaviour and then to offer practical guidance in terms of management. Suggestions for management may focus on things the team needs to do, things staff can ask relatives/carers to do, and changes which could be made to the patient's environment.

It is important to remember when seeking to change behaviour that consistency of approach is vital. Therefore all staff working with the patient need to be aware of the guidelines and use them every time they interact with the patient.

These guidelines have been written for staff. There may be information which staff feel it would be useful for relatives/carers to know and it is intended that in such cases this information would be discussed with the relatives / carers by a member of the team, rather than simply being given to them. If a member of staff wishes to give a relative or carer a copy of any of these guidelines, this should only be done with the agreement of a psychologist (if available) or occupational therapist (OT) who knows the patient.

Further help in managing this patient group

Managing patients with neuro-behavioural disorder in an acute setting can be very challenging. For patients being treated outside of the Major Trauma Centre, please flag up any behavioural problems with your Trauma Link who can contact the Network Co-ordination Service for further advice.

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08.c.vi • Behavioural management guidelines: post traumatic amnesia (PTA)

Everyday memory and general functioning is disrupted.

Presentation

In the early stages after brain injury the person may still be in PTA. PTA is a phase marked by sometimes severe confusion/disorientation associated with memory loss for some events immediately before the injury and memory loss for events since the injury. Therefore, although the person may be conscious and responsive their everyday memory is not working at all. This is because their brain function is so disrupted that they are unable to lay down new memories. The person may be agitated and/or aggressive, which may be related to the bewilderment he or she often feels due to being unable to always remember what has happened.

- The person may be unable to work out what is happening to them and thus become frightened and/or agitated. Their behaviour may appear bizarre and they might become fixed on an idea, eg. they firmly believe that they have to get to a meeting, or that the hospital is a hotel or a prison.
- It may take some weeks for the person to remember important information, eg. they are in hospital; they have had a brain injury; who people are.
- The person is often disorientated in time, ie. not remembering the day of the week, month or year.
- The person may have great difficulty in finding their way around the unit and they may wander, putting them at risk.
- In the first few weeks the person will tire easily doing very simple things and will only be able to concentrate on what you are saying or doing for very short periods.

The duration of PTA is linked with the severity of the head injury. The longer the period of PTA, the more severe the head injury, with PTA lasting more than seven days being considered representative of a severe head injury. PTA can last from hours to days to weeks and is a difficult period to manage. If the period of PTA is prolonged, consideration should be given to transferring the patient to a specialist neuro-behavioural environment (see Directory of Services and seek advice via the Network Co-ordination Service).

Attention

In the early stages of recovery following a brain injury the person will often have difficulty with many aspects of attentional function. Therefore he or she may only be able to concentrate or focus on something for very short periods of time. He or she may also have difficulty in attending to more than one thing at a time. There may also be difficulties in switching from one task to another. This often improves quickly over the first few weeks. It will be necessary to keep any instructions you give the person very short and concise.

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Clinical management issues to consider

Team

- Try and organise a single room for the patient.
- For the first week or two following admission the person should not be permitted to leave the ward unless accompanied by a member of staff (consider Deprivation of Liberty (DOL)). If confusion and/or disorientation is severe and the person presents a risk, eg. wandering, it may be necessary to provide 'specialising' to reduce risk.
- General communication:
 - Do:**
 - remain calm at all times during communication
 - expect to have to repeat yourself time and time again
 - use an errorless learning approach, ie. give the patient correct biographical and situational information
 - Don't:**
 - become frustrated with patient or with lack of progress – this phase is usually shortlived (days) but can last for weeks
 - try and test the patient's memory or orientation unless performing a formal cognitive assessment
- Orientation:

An orientation kit consisting of a board with cards giving current information (year, month, date, day of the week, name of hospital) should be put on the person's wall in their room and the person should have their attention directed to it frequently during the day. Encourage visitors to do the same. As the person improves they can be encouraged to change the cards on the boards themselves.
- Programme:

A large copy of the person's weekly programme will be put on their wall. Attention should be drawn to it frequently throughout the day to assist with orientation, eg. what the person is doing next. As the person gradually improves, encourage them to refer to the programme each day themselves.
- Overstimulation:

Balance the need for a regular programme of activities with the person's need for lots of rest at this stage. If the person is in PTA or does have significant attentional problems, this may mean that therapy sessions will be very short at first. Cognitive assessment should be kept to a minimum, but if any longer than 20 minutes should be conducted in stages over several days. Make use of bed rest or 'quiet time' at regular intervals and especially if the person is upset or agitated.

Outcome measures/assessment tools

- perform risk assessment regarding risk to self or others, including risk of absconding
- Westmead PTA Scale
- seek specialist advice

References

Rehabilitation following acquired brain injury: national clinical guidelines, BSRM & RCP (2003)

Delirium: diagnosis, prevention and management (NICE, July 2010) (same principles apply)

Post Traumatic Amnesia factsheet, www.headway.org.uk

Good practice & clinical guidelines

Seek specialist advice via Network Co-ordination Service

Family and visitors

- Write a simple account of the accident which led to the hospital admission.
- Keep a diary in the room for visitors to use. They can record simple information, eg. who visited and when, what was done or talked about.
- Ask visitors to leave some photographs of people/pets/home with labels underneath.
- Ensure visitors do not try to 'test' their relative by asking lots of questions. At this early stage it is much better to just give information, rather than expect them to remember it.

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08.c.vi • Behavioural management guidelines: agitation

Brain injured people at an early stage of recovery tend to have a very low tolerance for frustration and fatigue, eg. if you are late, if they cannot do something easily or if they need a break.

When first admitted to hospital it is common for many patients to go through a stage of agitation, maybe because the environment is new and unfamiliar to them and they are struggling to adjust to their situation. They could be worried about physical or cognitive changes or simply desperate to get home and concerned about their future. In particular, cognitive changes may make it difficult for the person to be aware of and control their agitation.

As time progresses and the person adjusts to their environment and their situation and begins to make relationships on the ward, agitation generally decreases.

Clinical management issues to consider

- Consider the potential for the presentation being due to drug or alcohol withdrawal or other medical factors.
- Remember brain injury patients are very sensitive to the psycho-active properties of drugs.

Team

- Remember that the person may not recognise that they are beginning to become agitated and it is therefore necessary for you to take the lead.
- If the person becomes agitated find out why if you can. Try to calm them down, eg. by reminding them why they are in hospital. If the agitation does not reduce, distract the person's attention to something else or if it is safe to do so leave them to be alone for a short period.
- Try to keep the environment as quiet as possible and encourage the person to have rests at regular intervals.
- Structure the person's day to balance stimulation and relaxation. Remind the person about what they are meant to be doing and when, as routine can provide familiarity and reassurance.
- Try not to take the person's behaviour personally. It is important to be calm and speak quietly. The person cannot control the way they are behaving at this early stage.
- When the person has calmed down they are often apologetic. Use this opportunity to reinforce information you want them to learn, eg. 'you tend to get worked up because you have had a brain injury'.

Family and visitors

- Try to encourage only one or two visitors at any one time.
- At the early stage visitors should be limited to several people the person knows really well. It is often useful to agree who these people will be with a key family member (if other visitors arrive unannounced it may be necessary to refuse access with appropriate explanation).
- Discourage visitors from questioning or testing the person about what they can remember or do. Avoid direct confrontation as much as possible.
- Early on, visits should be kept short, in some cases as short as 15–20 minutes if the person gets very agitated. Try to ensure visitors keep to this even if the person seems to be coping well. It is better to end the visit on a good note.
- If the person becomes agitated before the normal end of the visit, try to calm down and distract them onto another topic of conversation or onto another activity, eg. by taking them for a walk. It may be necessary to leave earlier than planned. Remind relatives that the person will have good and bad days.

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Outcome measures/assessment tools

- Agitated Behaviour Scale (ABS)
- Antecedent, Behaviour, Consequence (ABC) chart
- perform risk assessment
- seek specialist advice

Good practice & clinical guidelines

Seek specialist advice via Network Co-ordination Service

08 • Rehabilitation

Traumatic brain injury

08.c.vi • Behavioural management guidelines: disinhibition

Early in recovery after brain injury disinhibition may result because the person lacks full control of their behaviour, being unable to distinguish between socially appropriate and inappropriate behaviour. This is often a result of frontal brain injury, particularly the orbito-frontal regions.

Presentation

- Over-familiarity, eg. willingness to divulge too much personal information or where the person expects staff or other patients to divulge too much personal information.
- Using language that the person would not normally use in this setting, eg. swearing.
- Inappropriate sexual behaviour, eg. inappropriate sexual remarks or advances.
- Laughing inappropriately or silliness.

Clinical management issues to consider

It is important to be aware of certain factors either internal or external which may be acting to trigger inappropriate behaviour. Thus, if the person is over-tired, bored, or over-stimulated, these are examples of internal factors which may be influencing their behaviour. Examples of external factors which can trigger inappropriate behaviour are noise, other patients, a change in routine, or being asked to do something they do not want to do, or find difficult to do. It is therefore necessary when trying to change behaviour to consider all of these factors and change them where possible, eg. moving the person to a single room, or giving them shorter therapy sessions.

Disinhibited or inappropriate behaviour can be very upsetting and even frightening to family members or in some cases may cause the family to become angry themselves. It is therefore essential for the team to explain to the family what is causing the behaviour and advise them on simple ways of dealing with it. This may include things like leaving the person if they become agitated to go and have a drink or even cutting a visit short and trying again later.

Discourage

When behaviour is inappropriate calmly but firmly discourage the inappropriate behaviour immediately. When inappropriate behaviour is more subtle or in a group situation you can try to ignore it and distract the person onto something else.

Feedback

Give the person immediate feedback about the inappropriate behaviour. Be very specific about what aspects of the person's behaviour is inappropriate and why, eg. if the person is undressing in public you could say: "This is not the time nor place for taking your clothes off". Explain the need for privacy or the possibility of offending others. Be aware that the person may be unaware of when they are behaving inappropriately or how bad it is. Often after brain damage people have problems with monitoring their behaviour. Often, providing regular feedback can itself be enough to trigger improvement.

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Coach

Encourage the person to behave appropriately by encouraging the behaviour you consider appropriate for the situation, eg. "In a group of people it is polite not to shout. People will listen better if you speak calmly.". Praise the person when they manage to behave or interact appropriately and provide a reward if possible, eg. a drink, a walk in the garden, etc.

Due to cognitive problems such as poor attention or poor memory, be prepared to repeat yourself often. Changing behaviour takes time!

Redirect

After providing constructive feedback and coaching, redirect the person in order to re-focus their attention on the activity they were engaged in before the inappropriate behaviour occurred. If the person was not actively doing something before find something for them to do.

Outcome measures/ assessment tools

- perform risk assessment to clarify level of risk to self and others. If risk demonstrated, seek specialist advice

Good practice & clinical guidelines

Seek specialist advice via Network Co-ordination Service

08 • Rehabilitation

Traumatic brain injury

08.c.vi • Behavioural management guidelines: confabulation

Confabulation has been defined as 'a falsification of memory occurring in clear consciousness in association with an organically derived amnesia' (Berlyne, 1972). Confabulation manifests after brain trauma particularly when there is a combination of memory loss and frontal lobe injury.

Confabulation is usually temporary but may in some cases continue to be a long term problem.

Examples of confabulation

- Bizarre explanations about how the accident happened.
- Getting information or details of conversations mixed up.
- Talking with conviction about something which did not happen.

Clinical management issues to consider

- Never encourage or reinforce inaccurate information. Calmly but firmly correct the information, eg. 'This is what did happen or this is what we talked about'.
- Some people will become agitated or confrontational when corrected. After giving correct information distract their attention onto something else.
- Provide explanation to family about why confabulation occurs.
- Encourage family and friends not to ask the person to explain why they believe what they have said. This simply results in confrontation or long tiring explanations and reinforces the incorrect information. Advise them to correct the person quickly but in a kind and matter of fact way.

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Outcome measures/ assessment tools

- perform risk assessment to clarify level of risk to self and others. If risk demonstrated, seek specialist advice.

Good practice & clinical guidelines

Seek specialist advice via Network Co-ordination Service

08 • Rehabilitation

Traumatic brain injury

08.c.vi • Behavioural management guidelines: perseveration

This refers both to:

- Perseveration of ideas: where the person is unable to move onto another topic of conversation, returning to the same theme repeatedly.
- Perseveration of behaviour: where the person repeats the same action and is unable to break the cycle without help, resulting in them repeating the same mistakes.

Clinical management issues to consider

Perseveration of ideas

Signal to the person that you are going to change the topic so they can try to clear their mind and concentrate on a new topic. Move on, but be prepared to give a reminder that you are now talking about something else, eg. 'No we are going to talk about this (whatever it is) now'.

Perseveration of behaviour

It can be helpful to model what you want the person to do instead. If this does not work after a few tries it is better to take a break. Try not to allow the person to become agitated as this can make things worse.

With family

Explain to the family why the person is so repetitive in their conversation or behaviour as otherwise the behaviour can be irritating or seen as being 'difficult'.

Outcome measures/ assessment tools

- seek specialist advice

Good practice & clinical guidelines

Seek specialist advice via
Network Co-ordination
Service

08 • Rehabilitation

Traumatic brain injury

08.c.vi • Behavioural management guidelines: lack of insight/denial

Impaired insight is a common feature of frontal brain injury.

- Impaired insight usually improves over time as the person becomes more aware of their limitations. However, in some cases development of insight will be part of a longer process and may require specific intervention.
- People with brain injuries, whilst usually able to recognise physical disabilities often have difficulty in recognising and accepting changes in thinking and behaviour.
- In order to behave appropriately in social situations we need insight. Insight enables us to predict and evaluate the effect of our behaviour on other people and allows us to imagine how they feel.
- Lack of insight in the early stages is often due to the extent of disruption of normal brain function and is therefore related to the extent of the damage.
- Lack of insight often causes difficulty because the person often refuses to accept their limitations and may be reluctant to participate in rehabilitation seeing no need for it. It may therefore cause aggression.
- Lack of insight may also reflect a psychological difficulty in accepting changes in oneself and one's situation. In this case it is usually referred to as denial.

Clinical management issues to consider

- Give simple, repeated explanations of why the person needs to be in hospital. Likewise, give clear, simple and frequent explanations of why the person is unable or less able to do something. It may be useful to have the above explanations written down for the person. The whole team should be aware that the same information usually needs to be repeated many times until it 'sinks in'.
- The person may have an unrealistic view of what they are able to do, eg. going home, going to work. Be cautious about telling someone just that he or she cannot possibly do something now. Instead, set specific smaller goals that are realistic and emphasise the importance of achieving these first in order to reach the patient's goal. This enables the person to feel that they are still making progress and helps them see the point of what you are working on.
- If, after a clear explanation the person still continues to refuse to accept problems or the need for help it is usually better to change the subject or do something else. Long attempts to reason with the person will only result in agitation and stress. You can emphasise the need for rest and relaxation at this stage of recovery and if necessary, leave the person alone for a short time.
- It may be useful to agree set goals with the person and begin working first on those which they are most motivated to achieve. If a person is repeatedly reluctant to work on something it may be necessary to switch to something else.
- Alternate between working on things that the person finds difficult and things that s/he enjoys.
- Involve relatives and friends in reminding the person about the reasons why we need to work on something.
- Go slowly and initially set out to achieve small goals, eg. the person will spend 10 minutes in the agreed activity. This can be gradually increased as motivation improves.

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- Assessments and functional tasks can be used as a means of demonstrating difficulties to the person. When a difficulty is encountered draw the person's attention to it in a matter of fact way. Remember to emphasise progress made and potential for improvement, eg. if the person is doing some cooking and misses out a step, draw attention to it and try to work out with them why this happened (could this be due to a memory failure or not reading the whole recipe).

**Outcome measures/
assessment tools**

Seek specialist advice

**Good practice &
clinical guidelines**

Seek specialist advice via
Network Co-ordination
Service

08 • Rehabilitation

Traumatic brain injury

08.c.vi • Behavioural management guidelines: poor motivation and initiation

Injury to the medial frontal regions of the brain is particularly associated with the presence of apathy. The apathy often has emotional, motor and cognitive dimensions and manifests as poor initiation and motivation.

Poor initiation is a difficulty in getting started. Typically the person will not do much at all when left alone and will have difficulty in generating ideas about what they could do. The person appears to lack motivation and/or interest in engaging in activities, but once started on activities may persist and enjoy them.

Poor initiation and motivation can often be mistaken as laziness. In other cases poor initiation and motivation may reflect the person's lack of insight or be associated with depression. It can also be because the person does not yet understand the goals of rehabilitation or the process involved. The person may also lack initiation but still be motivated to do some things, eg. he/she may be motivated to smoke but show poor initiation for getting washed and dressed. This is due to different areas of the brain being damaged.

Clinical management issues to consider

Before tackling these problems it is important (if possible) to identify which of the above factors are involved.

Depression

If there is reason to think that the person may be depressed it is important to first address this by asking the doctor or psychologist to carry out a specific mood assessment. Management may then involve medication and/or psychological intervention.

Frontal lobe damage

In this situation it is often necessary for the therapist / nurse to take the lead. Ensuring that the person has a clear structure to the day is important in improving initiation as it allows the patient to experience repetition of a task, which makes learning easier.

Possible strategies

- Provide opportunities for the person to engage in activities. Try to find out what the person might want to do and do not expect them to be able to choose between lots of different options. Provide two options for them to choose from.
- Provide structure for the day, eg. in the programme and be prepared to give lots of encouragement, prompting and reinforcement.
- Make use of timers and alarms to alert the person as to when an activity is about to start or when they are expected at therapy.
- Make relatives aware of the reasons for poor initiation/motivation as otherwise the behaviour can be upsetting or misinterpreted as laziness or lack of interest.

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Outcome measures/ assessment tools

Seek specialist advice

Good practice & clinical guidelines

Seek specialist advice via
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Service

08.c.vii • Delirium after trauma

Delirium is an important and life threatening consequence of trauma, particularly among older adults, so having a high index of suspicion is essential.

Definition

Delirium, also known as the acute organic reaction can be defined as the state of confusion in the individual, characterised by an acute onset of fluctuating cognitive impairment, a disturbance of consciousness, impairment in attention and concentration and abnormalities of perception, emotional response and behaviour. Delirium develops over a short period of time, usually hours to days and tends to fluctuate during the course of the day.

ICD-10 diagnostic criteria

Symptoms in all of the following areas should be present:

- impairment of consciousness and attention
- global disturbance of cognition
- psychomotor disturbances (hypo- or hyper-active delirium)
- disturbance of the sleep
- emotional disturbances

Clinical presentation

Impairment of consciousness ('clouding') is a primary feature of delirium and two main types of delirium are recognised:

Hyperactive delirium	Hypoactive delirium
Agitation or restlessness	Confusion
Disorientation to time and place	Psychomotor retardation (slowness of movement and thought)
Psychotic symptoms, eg. hallucinations and delusions	Sedation
Sensory misperceptions	Patient quiet, withdrawn, stuporose or comatose
Pressured or incoherent speech	

The patient may rapidly fluctuate between the two presentations. In general, patients have difficulty in focussing and sustaining their attention and have abnormal sleeping pattern. Although usually delirium resolves within four weeks, it may last for six months or more.

Predisposing factors:	
Extremes of age	Unfamiliar environment
Sensory impairment (vision, hearing)	Cognitive impairment
Medical co-morbidities	More than 3 concurrent medications
Alcohol abuse	Smoking
Damaged brain: (Previous head injury, stroke, alcoholic brain damage, etc.)	History of delirium/dementia
COPD	Hypertension
Immobilisation	Sleep deprivation
Abnormal U&Es/LFTs	Use of opioid analgesics

Common precipitating factors (non-exhaustive):	
Trauma	Head injury, hypovolemic shock, falls, fracture, dislocation, pain
Central nervous system	Space occupying lesions, migraine, epilepsy, intracranial haemorrhage, stroke, TIA, tumour, hydrocephalus, meningitis
Systemic illness	Infections, burns, cancer, hyperpyrexia vitamin deficiency (thiamine, B12, nicotinic acid)
Alcohol/drugs	Intoxication, withdrawal, poisoning
Medication	Opioid analgesics, steroids, antibiotics, anticholinergics, anticancer drugs, neuroleptic malignant syndrome, serotonin syndrome, anticonvulsants, cardiac medication: digoxin, antihypertensives
Metabolic disturbance	Renal failure, liver failure, electrolyte imbalance, hypoxia, dehydration
Endocrine disorder	Thyroid or parathyroid abnormality, adrenal abnormality
Miscellaneous	Acute coronary syndrome, COPD, blood dyscrasias, any surgical procedure

Course, prognosis and complications

- Half of all patients with delirium are diagnosed by the third day of presentation
- Typically, symptoms of delirium usually last three to five days but there is wide variation.
- Slow resolution of symptoms can lead to persistence of delirium six to eight weeks in the severely ill with as many as 15% remain symptomatic six months after the onset of delirium, especially in the elderly.
- The increased risk of mortality associated with delirium may last up to three years with a risk ratio of at least two. Also, the risk of cognitive and functional impairment remains high two years after the onset.
- A serious complication of poorly resolved delirium is death and the most common complication is dementia (13-fold increase).

Management

The management of delirium involves the following four principles:

- a) identifying the precipitating and contributing causes of the delirium and effectively treating them (whether directly or indirectly related to the trauma or unrelated to trauma)
- b) ensuring patients' safety and educating patients, families and staff about the presentation
- c) management of the environment of the patient and providing general supportive measures
- d) pharmacological management and symptomatic treatment of behaviour

Identifying and treating the cause

- Take detailed history from patient and informants
- Check drug list, prescribed and other
- Physical examination
- Investigations should include FBC, U&E, LFT, TFT, blood glucose infections screen, toxicology screen, urinalysis and CXR if indicated

Ensuring safety and family and staff education

- Give advice regarding the diagnosis and what to expect in the short and medium term
- Enrol relatives and carers in helping with orientation
- Staff to provide repeated orientation to patient
- Staff to monitor patient condition and levels of hydration
- Staff to ensure patient is kept safe at all times – this may require a 1:1 special if the patient is ambulant and disorientated

The environment

- Nurse in an adequately lit room with an appropriate level of stimulation
- Provide orientation cues like clocks, calendars, etc
- Provide a high level of continuity of care by preferably having the same set of nursing staff to rotate through the day
- Correcting sensory impairments, eg. make sure the patient is wearing their hearing aid/spectacles
- Promote mobilisation
- Maintaining the sleep-wake rhythm

Pharmacological management

This involves rationalising current medication, avoiding adverse drug interactions and poly-pharmacy. Only use sedation if all non-pharmacological measures have failed and:

- essential investigations/procedures are required
- the patient is a danger to themselves or others through their behaviour
- the patient is in significant distress where all non-pharmacological interventions have failed.
- gain consent where possible or treat in best interests (involving the family) under the Mental Capacity Act if capacity is lacking
- refer to the local guidelines and protocol for pharmacological management of symptoms of delirium.

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continued over...

- use a single sedative drug at the lowest effective dose and monitor for unwanted side effects such as respiratory depression, arrhythmias or extrapyramidal symptoms. Usually typical antipsychotics are preferred over atypical, which in turn are preferred over benzodiazepines.

Key messages

- Delirium is often missed and may be associated with a poor outcome
- Lucid intervals in delirium may often lead to false impressions
- The hypo-active type may be easily missed in busy medical/surgical wards.
- Delirium is associated with cognitive and functional decline, medical complications, increased risk of mortality, delayed discharge, increasing nursing care and increased use of nursing home placements
- Reverse the reversible and provide consistent support in a structured environment
- Avoid sedatives unless essential for the health and safety of the patient or others

Look out for delirium – it is easily missed!

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08.c.viii • Psychological consequences of trauma

Acute mental health problems

Some mental health problems confer a greater risk of suffering from major trauma. Obvious examples are drug or alcohol dependency, but illnesses which have increased degrees of impulsiveness, risk taking and suicidal behaviour are over-represented in major trauma cohorts. Therefore, all services dealing with major trauma patients should be sensitive to the psychological needs of their patients.

In the acute medical setting the prime additional problems encountered tend to be:

1. safety of acutely suicidal patients
2. drug/alcohol dependency and withdrawal
3. the behavioural sequelae of traumatic brain injuries (see sections 8.? – 8.?).

1. Post suicide attempt

Any trauma patient who has recently committed a suicide attempt should be reviewed by a psychiatric team as soon as they are able to give an accurate history. If there is a delay before psychiatric assessment (which will provide an accurate risk assessment and management plan), keeping the patient safe whilst continuing to treat the traumatic injuries is important, including 1:1 care when required.

2. Alcohol withdrawal

Alcohol misuse is common amongst major trauma patients but only a minority of this group will enter into frank alcohol withdrawal, although this is often a difficult problem to detect when a patient has had a significant head injury and little collateral history is available.

Symptoms of alcohol withdrawal (peak at days two to five)

- tachycardia
- sweating
- tremor

Mental state changes include:

- insomnia
- anxiety

which can develop into delirium tremens:

- persecutory delusions
- visual hallucinations
- agitation
- seizures

Untreated delirium tremens has a mortality as high as 10%.
See local hospital protocol for treatment.

Wernicke's encephalopathy

- easily missed post trauma
- result of chronic thiamine (vitamin B1) deficiency secondary to malabsorption (usually alcohol induced)

Triad of

1. confusion
2. ataxia
3. ophthalmoplegia

although often only confusion is present. It can be hard to distinguish from the numerous other causes of confusion immediately post trauma, especially where a head injury and no collateral history is present. Where alcohol dependency is suspected it should be treated pro-actively as it can progress to Korsakoff's syndrome, an irreversible inability to lay down new memories. Treatment and prophylaxis is via parenteral vitamin B complex.

Summary of managing acute mental health problems following trauma:

- Involve local psychiatric teams early in the assessment of suicide attempts.
- Have a low index of suspicion for alcohol withdrawal and Wernicke's.
- Treat suspected alcohol withdrawal and Wernicke's pro-actively
- Obtain a good collateral history regarding suspected suicide attempts and pre-existing drug/alcohol use

Do not:

- be afraid to ask about mental health symptoms, including suicidal thoughts and plans
- consider alcohol withdrawal and Wernicke's as diagnoses of exclusion.

08.c.ix • Psychological consequences of trauma

Chronic mental health problems including post traumatic stress disorder (PTSD)

Over the course of the year following major trauma, mental health problems are common, with almost a third suffering from a mental disorder. The four most prevalent disorders being a major depressive episode, generalised anxiety disorder, substance misuse and post traumatic stress disorder. (Bryant et al. (2010)).

When quality of life is considered, psychiatric illness has a greater impact at one year than either injury or pain (O'Donnell et al. (2013)).

Therefore, a comprehensive rehabilitation programme should be sensitive to the mental health needs of its patients.

The bulk of new psychiatric diagnoses following trauma involve depression and the anxiety disorders. Most new diagnoses are not present initially and evolve over the course of the year and in this setting mental illness comorbidity is common. When it is considered that many cases will have ongoing physical disabilities, pain and possibly cognitive problems following the trauma careful assessment of patients' mental health requirements is necessary. It should be noted that mental illnesses arising within this group remain treatable and should not be dismissed as 'understandable'.

Post traumatic stress disorder

Post traumatic stress disorder (PSTD) can develop in response to one or more traumatic events in individuals who have directly experienced or witnessed a traumatic event that includes actual or threatened death. It can lead to significant distress and functional impairment.

Symptoms

Typically develop soon after the event. Involuntary re-experiencing of the traumatic event is a key feature. This includes: intrusive recollections, nightmares and flashbacks, in which the individual subjectively feels back within the traumatic event. Reminders of the traumatic event could trigger psychological distress and physiological reactions. This often leads to avoidance of these, which is another core feature of the disorder. A common strategy of avoidance is to push memories of the trauma to the back of their mind, forcing themselves not think about it.

Other symptoms include hyper vigilance and hyper arousal symptoms including:

- anger outbursts
- exaggerated startled response
- difficulty concentrating
- scanning for threat
- emotional numbing
- sleep disturbances
- substance misuse

Risk factors for development of PTSD

Some individuals may be more at risk than others of developing psychological difficulties following a traumatic event. People who may be at increased risk of this include:

- women
- previous experience of psychological difficulties
- experiencing an interpersonal trauma
- individuals with an acute stress reaction (similar symptoms to PTSD but less than a month after the event)
- having experienced a previous trauma
- high level of perceived threat during trauma.

Screening for PTSD

People with symptoms of PTSD may find it distressing to talk about the traumatic event. This could cause them to have difficulties in describing the nature of the event and in reporting any associated symptoms. If you feel the individual would benefit from being screened for PTSD, or any mental health problems, discuss this with a mental health professional, such as a clinical psychologist or your local liaison psychiatry service.

Clinical management considerations

- Assess for risk, eg. suicide ideation, thoughts of wishing to harm themselves or others. If there are any risk issues, manage these first.
- Do not offer a single session of psychological debriefing shortly after the event; **this can be harmful.**
- Take into account any potential triggers on the ward/assessment environment which may inhibit symptoms of PTSD, eg. loud noises, flashing lights, sudden movements etc. Adapt assessment environment to suit needs of the individual, eg. if loud noises trigger flashbacks, treat in a quiet room.
- Provide empathy and normalise the patient's trauma symptoms.
- Provide psycho-education to the patient their friends and family about PTSD
- Screen for PTSD and refer onto a clinical psychologist if the individual meets criteria.

Family/visitors

- Assess the impact of the traumatic event on all family members.
- Provide the family and close friends with psycho-education on the symptoms of PTSD and the type of treatments available.
- Encourage the family/friends to allow the person with trauma to talk about their experiences as opposed to pushing it to the back of their mind.
- Try to encourage the family/visitors to normalise the person's symptoms.
- Remind the family/friends that certain things may trigger the person's symptoms, such as flash backs or re-living experiences (see above under 'symptoms'). Explain that there may be good days and bad days for the person, depending on where they are and how they are feeling.

Management

- Guidelines by the National Institute for Clinical Health and Excellence (NICE; 2005) suggest that trauma-focused psychological therapy should be the first treatment of choice offered to individuals with PTSD.
- All people who present with symptoms of PTSD should be offered an evidence based trauma-focused psychological intervention. These should either be trauma-focused cognitive behaviour therapy (CBT) or eye movement desensitisation and reprocessing (EMDR). Other evidence based trauma focused interventions include prolonged exposure therapy and cognitive processing therapy. Individuals can access these therapies via referral to a Clinical Psychologist or to their local Improving Access to Psychological Therapies (IAPT) service or Secondary Care Service. These referrals can also be made through contacting the individual's GP.
- Evidenced based pharmacological options are available where trauma-focussed therapies are refused, unavailable or otherwise inappropriate. Such medications include: sertraline, paroxetine and venlafaxine. Treatment should be continued for 12 months in those who have responded.

Time lines for treatment

- If symptoms are mild, offer a routine follow-up appointment at least four weeks from your initial assessment to explore any further development of symptoms. This is also referred to as 'watchful waiting'.
- The NICE (2005) guidelines recommend for trauma-focused cognitive behavioural therapy (CBT) to be offered to those with severe symptomatology in the first month following the traumatic event.

Further sources of information

- Post traumatic stress disorder. National Institute for Health and Care Excellence: www.nice.org.uk/CG26
- Information leaflets on PTSD are available from the Royal College of Psychiatrist's website: <http://www.rcpsych.ac.uk/healthadvice/problemsdisorders/posttraumaticstressdisorder.aspx>

08 • Rehabilitation

08.d • Spinal cord injury (SCI)

Spinal cord injury refers to injury to the cord itself, whether this is complete or incomplete, and not simply a bony fracture of the spinal column. With spinal cord injury there may or may not be accompanying bony fracture or dislocation, and there will be a degree of neurological loss (of function).

Clinical management

- Involve physiotherapists immediately – particularly for chest management.
- Undertake accurate pre (and post) surgery American Spinal Injuries Association (ASIA) scoring.

In the early stages of rehabilitation consider management of:

- chest / airway / breathing
- Autonomic dysreflexia (AD) – see 8.d.ii
- Poikilothermia*
- bladder – see 8.d.iii
- bowel – see 8.d.iv
- pressure area care
- spasticity, spasm and posture management, including splinting
- orthostatic postural hypotension†
- neuropathic pain
- nutrition, including swallowing
- psychological support

Other actions

- Make referrals to the patient's local area wheelchair services.
- Commence application for continuing healthcare (CHC) eligibility if appropriate (and patient consents).
- Refer to patient's home area social services (if patient consents).
- Liaise with Spinal Injuries Association (SIA) peer support workers for support visits.
- Liaise with Department of Work and Pensions (DWP) advisor and legal services advisor as per patient/relatives wishes.

* Poikilothermia – a term used to describe the fact that spinal cord injury affects a person's ability to control their body temperature. Instead, the paralysed body adopts the temperature of the local environment. Poikilothermia occurs in patients with lesion above T1.

† Orthostatic postural hypotension – this occurs when there is an inability for the circulatory system to adapt to moving to an upright position. When an individual sits with the legs lowered, the body's blood pools in the lower extremities. Blood pressure drops and the individual feels dizzy, light-headed or like they are going to faint. Rising slower will help, but elastic stockings and an elastic abdominal binder are necessary to assist the body with blood circulation.

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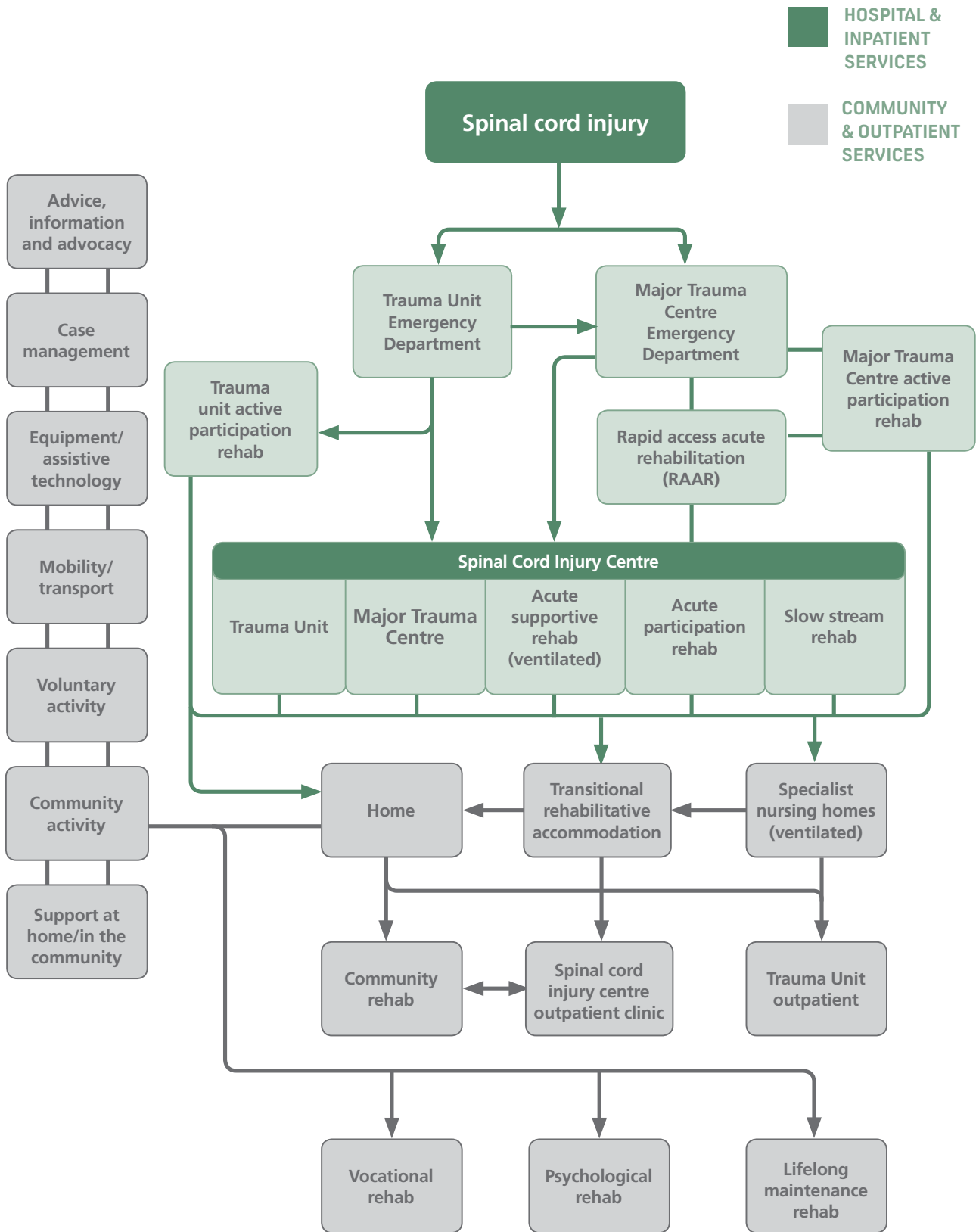
Management of People with Spinal Cord Injury (NHS Clinical Advisory Groups Report, 2011)

Standards for Patients Requiring Spinal Cord Injury Care, Service Standards – Revised (South of England Spinal Cord Injury Board, 2010)

Chronic Spinal Cord Injury: Management of Patients in Acute Hospital Settings (RCP, 2008)

08.d.i • Spinal cord injury (SCI)

Pathway



Based on the model developed by the Eastern Head Injury Group; Pickard, Seeley, Kirker et al, *Journal of the Royal Society of Medicine* (August 2004)

08 • Rehabilitation

Spinal cord injury (SCI)

08.d.ii • Autonomic dysreflexia (AD)

AD is a sudden and potentially lethal surge of blood pressure and it is often triggered by acute pain or a harmful stimulus. It is unique to spinal cord injuries and affects spinal cord injured people with lesions at or above T6. It can cause an extreme hypertension and can lead to cerebral haemorrhage and even death. It should **always** be treated as a medical emergency. Examples of typical triggers are: a full bladder, a full rectum, and an in-growing toenail.

AD can occur at any time following the onset of spinal cord injury and spinal cord injured people with incomplete lesions are just as likely to experience autonomic dysreflexia as people with complete lesions, although (it is reported that) symptoms are less severe with incomplete lesions.

AD occurs without warning in response to a painful or noxious, stimulus below the level of spinal cord lesion. This stimulus causes reflex sympathetic over-activity below level of cord lesion, leading to vasoconstriction and systemic hypertension. The hypertension stimulates the carotid and aortic baroreceptors leading to increased vagal tone and bradycardia. Peripheral vasodilatation, which would normally relieve the hypertension, cannot occur because of the injured cord. Blood pressure continues to rise until the cause is removed. (NSCISB, 2012)

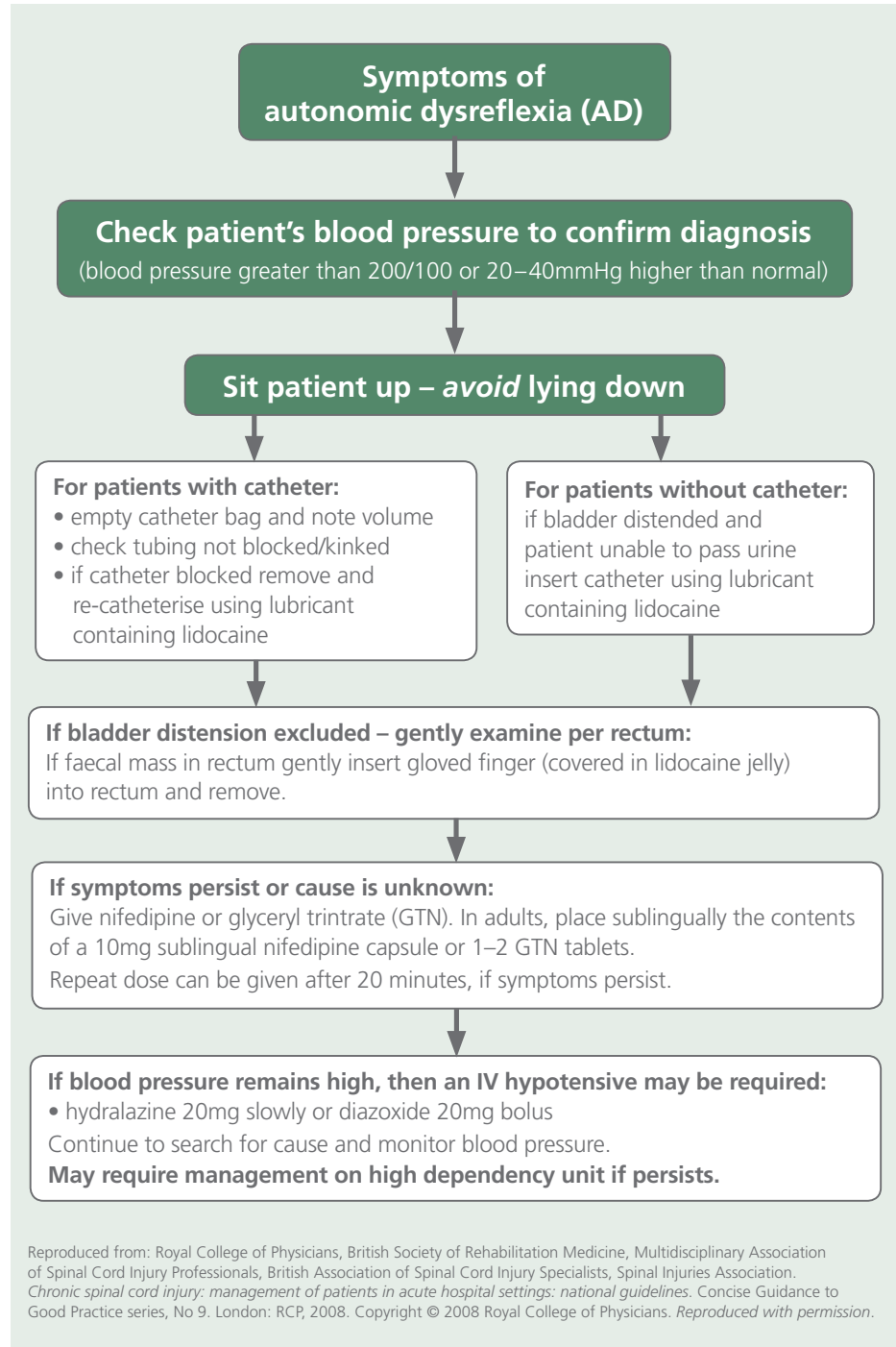
A patient with potential for AD should be issued with an AD card, which is available from the Spinal Injury Association (SIA).

Signs and symptoms of AD

The below list of symptoms is not exclusive. Patients may experience one, all or none of these symptoms:

- pounding headache
- hypertension (significant rise from patient's normal baseline)
- blurred vision
- pupil constriction
- bradycardia (<60 beats per minute)
- respiratory distress
- nausea
- nasal congestion
- sweating above the level of injury
- flushed (reddened) face
- piloerection (goose pimples)
- red blotches on the skin above level of spinal injury
- cold, clammy skin below level of spinal injury
- patient is restless or apprehensive

Clinical management



Outcome measures/ assessment tools

- blood pressure chart
- stool chart
- fluid balance chart

References

Autonomic Dysreflexia Factsheet (Spinal Injuries Association, 2007)

Chronic Spinal Cord Injury: Management of Patients in Acute Hospital Settings (RCP, 2008)

The Initial Management of Patients with Spinal Cord Injuries (National Spinal Cord Injury Strategy Board Working Party, 2012) [draft – unpublished]

08 • Rehabilitation

Spinal cord injury (SCI)

08.d.iii • Management of the neuropathic bladder

Acute clinical management

In the acute stage, urethral catheterisation is recommended, unless priapism* is present, whereby supra-pubic catheterisation should be performed. The catheter should initially be left on free drainage.

Ongoing clinical management

Urodynamic studies are recommended to inform ongoing bladder management. This gives a baseline prior to starting ongoing bladder management and checks for any abnormalities.

Guidelines (EAU 2003)

- Urodynamic investigation is necessary to document the (dys-)function of the lower urinary tract.
- The recording of a bladder diary is highly advisable.
- Free uroflowmetry and assessment of residual urine is mandatory before invasive urodynamics is planned.
- Video urodynamics is the gold standard for invasive urodynamics in patients with neuropathic lower urinary tract dysfunction. Should this not be available, then a filling cystometry continuing into a pressure flow study should be performed.
- A physiological filling rate and body-warm saline must be used.

* Priapism – presence of persistent erection

References

Guidelines on Neurogenic Lower Urinary Tract Dysfunction (European Association of Urology, 2003)

* Gastrocolic reflex – this is one of a number of physiological reflexes controlling the motility, or peristalsis, of the gastrointestinal tract. It involves an increase in motility of the colon in response to stretch in the stomach and byproducts of digestion in the small intestine. Thus, this reflex is responsible for the urge to defecate following a meal. The small intestine also shows a similar motility response. The gastrocolic reflex helps make room for more food.

08 • Rehabilitation

Spinal cord injury (SCI)

08.d.iv • Management of the neuropathic bowel

Clinical management

Once daily:

- (administer stimulant (oral) laxative 8–12 hours before planned care if necessary)
- rectal stimulant suppository insertion
- gastrocolic reflex* stimulated by hot drink
- abdominal massage in the direction of the bowel motion (if trained to do so)
- digital rectal examination (DRE), and digital removal of faeces (DRF)
- single digital check to ensure rectum is empty after last stool passed

References

Guidelines for Management of Neurogenic Bowel Dysfunction after Spinal Cord Injury (Spinal Cord Injury Centres of the United Kingdom and Ireland, 2009)

08 • Rehabilitation

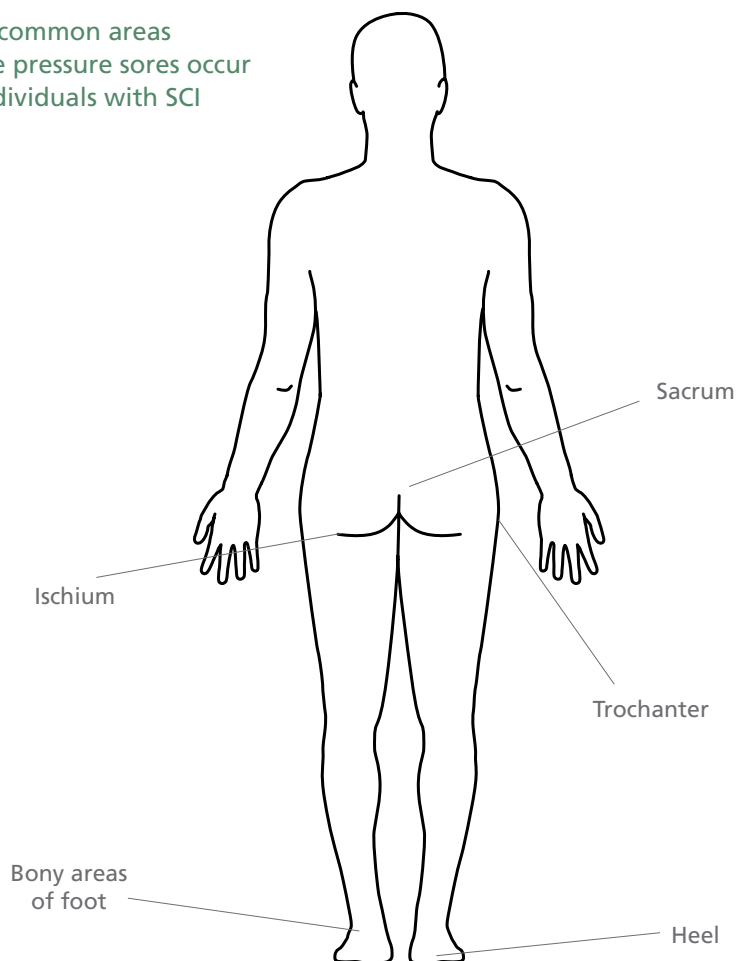
Spinal cord injury (SCI)

08.d.v • Skin care

A patient who has sustained a spinal cord injury (SCI) will have anaesthetic skin below the level of their injury, therefore development of severe pressure ulcers can occur quickly as the person would have no awareness that a problem is developing.

The most common sign that a pressure sore is beginning is the appearance of a red area, or red spot on the skin. Ordinarily, redness should clear within 30 minutes after the pressure is released from the area. If the redness does not clear, a pressure sore has begun. Non-use of muscles around the bony prominences of the body (hips, heels and elbows, sacrum and ischium) leads to muscle loss (atrophy), adding to the risk of skin breakdown. Any skin breakdown would mean that even once healed, the area would remain vulnerable to further breakdown in the future.

Most common areas where pressure sores occur on individuals with SCI



- The force of friction or shearing (the dragging movement of skin tissues across a surface), such as sliding in a bed or chair can cause blood vessels to stretch or bend, leading to pressure ulcers.
- An abrasion can occur when pulling across a surface instead of lifting.
- A bump or fall may cause damage to the skin that may not show up right away.
- People with limited sensation are also prone to skin injuries from burns.

Pressure sores can be caused by clothing, braces, or hard objects that put pressure on the skin. For example, following removal of any splint, skin will need to be checked thoroughly for any abrasions or marks to the skin to reduce the risk of skin deterioration.

Clinical management guidelines

For pressure sore prevention:

- Record the patient's Waterlow score and MUST score on admission and monitor these weekly.
- Ensure that the correct mattress is used on the bed, and the correct cushion if a wheelchair is used – this is guided by the Waterlow Score.
- The Patient's skin needs to be checked for pink/red marks or abrasions prior to them getting dressed each morning and again on their return to bed.
- Encourage or assist the patient to relieve pressure whilst sitting up in wheelchair for 2 minutes every hour.
- Keep the patient's skin clean and dry. Wet skin can become soft, inflamed and is less resistant to damage – wash and dry skin right away after any bowel or bladder accident; change clothes if they become wet.
- Use lotion instead of powder on skin.
- Encourage the patient to eat a well-balanced diet. Foods high in protein, vitamins and minerals help skin stay healthy and heal more quickly.
- Refer the patient to the dietician if indicated by the MUST score.
- Encourage to patient to drink – drinking the recommended amount of fluids to help skin stay soft.

For management if a pressure area develops:

- The key action on noticing a pressure mark on the skin is to **remove pressure from the area**.

Dependant on the location of the mark, this may necessitate a period of bed rest. However if an ulcer develops it could take months to heal, and many people with spinal cord injuries are hospitalised for lengthy periods due to skin breakdown.

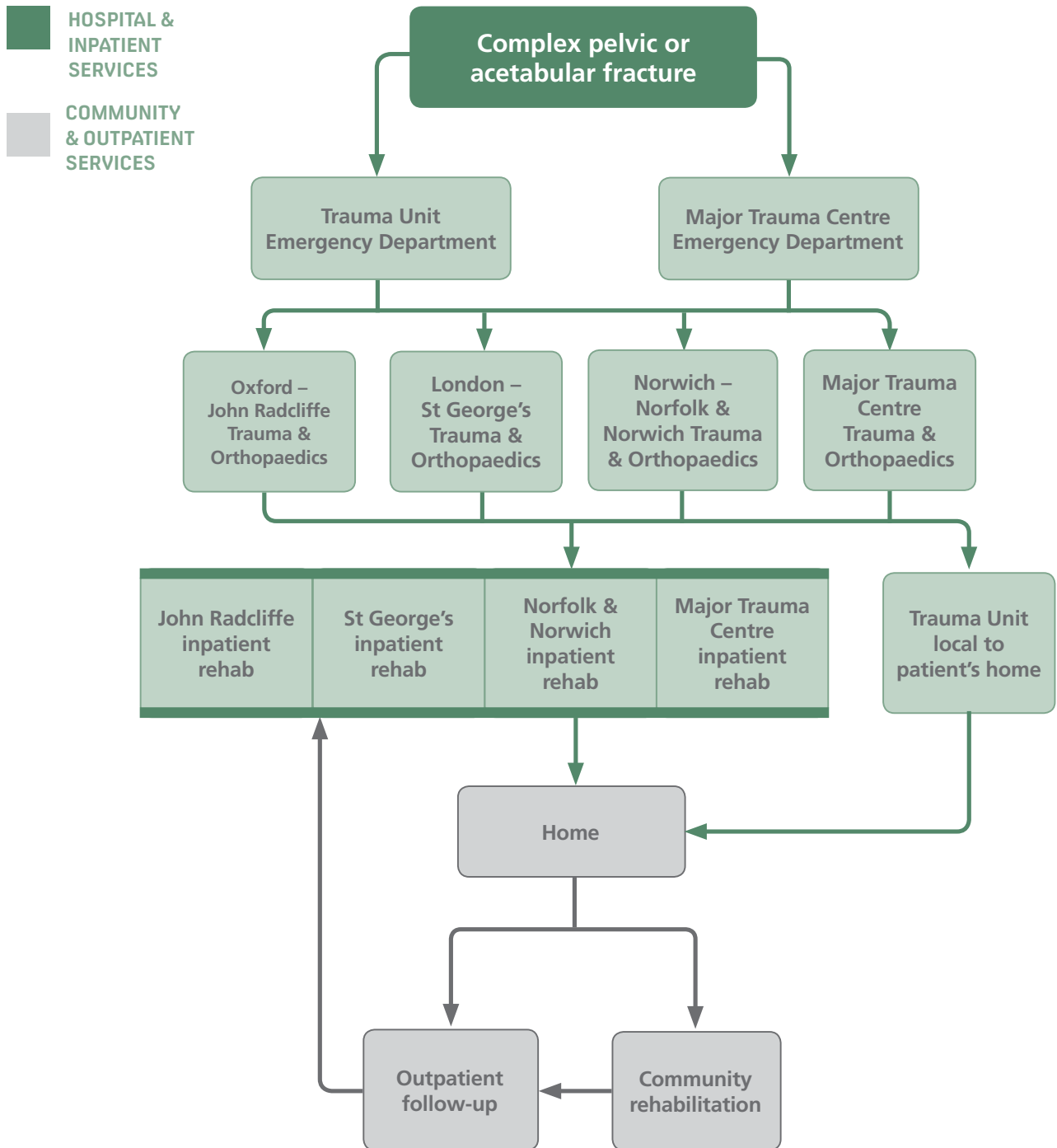
- Involve the Tissue Viability Nurse Specialist for advice on treatment or dressing of the area.
- It is essential to follow a rigorous, rigid turning regime.
- Reassess Waterlow and upgrade pressure relieving equipment as indicated.
- Reassess MUST score and refer to dietician (if not previously indicated by MUST score).

References

Pressure Ulcer Risk Assessment and Prevention (NICE, 2001)

.....
European Pressure Ulcer Advisory Panel (EPUAP), *Pressure Ulcer Prevention and Treatment Guidelines* (1998), www.epuap.org

Pathway



Based on the model developed by the Eastern Head Injury Group; Pickard, Seeley, Kirker et al, *Journal of the Royal Society of Medicine* (August 2004)

08 • Rehabilitation

Pelvic injury

08.e.ii • Pelvic and acetabular injuries rehabilitation guidance

Pelvic injuries are more common in patients with multiple trauma. It can involve the soft tissues as well as pelvic fractures, especially in high velocity injuries.

Clinical management issues to consider

Obtain knowledge regarding:

1. mechanism of injury
2. type of soft tissue injury / fracture:
 - genito-urinary
 - gastro-intestinal
 - neurological
 - pelvic fracture:
 - acetabular
 - stable pelvic ring fracture – anterior or posterior
 - unstable pelvic ring fracture – anterior or posterior
3. orthopaedic / urology / gynaecology / gastro-intestinal treatment received:
 - review X-rays / CT scans / MRI scans
 - review operation reports if applicable
 - discuss with surgeons details of operative findings and follow-up imaging required
4. normal course of healing for that injury / fracture, complications and expected outcomes

Acute stage management principles:

1. pain relief
2. monitor pulse, blood pressure and haemoglobin level
3. input / output charting including management of haematuria and urinary catheter (if urethral damage sustained)
4. consider paralytic ileus
5. document American Spinal Injuries Association (ASIA) score if neurological damage sustained

Rehabilitation MDT goals:

1. pain relief:
 - pain relief ladder: paracetamol, NSAIDs, opiates
2. prevent complications
3. maintain / restore range of movement (ROM) of joints
4. muscle strengthening
5. personal care and gait retraining

Watch out for complications:

1. local:

- blood vessel damage: monitor circulation
- nerve damage: Please refer to spinal cord injury guidelines regarding bowel and bladder management. Consider urology and gastro-intestinal surgery input as indicated eg. stoma care
- stiffness of joints and muscle atrophy
- wound infection – swab for culture and sensitivity (C&S) and start systemic antibiotics
- pin site infection if an external fixator is used, swab for C&S and discuss with orthopaedic team starting systemic antibiotics
- metal work loosening or damage
- delayed union which can progress to non-union
- malunion: monitor for fracture redisplacement
- genito-urinary, eg:
 - urethral stricture if urethral trauma sustained
 - testicular haematoma

2. systemic:

- deep vein thrombosis (DVT) / pulmonary embolism (PE)
- anaemia
- fat embolism
- pneumonia
- urinary tract infections
- constipation
- pressure sores

Mobilisation:

1. Can be a progression from complete bed rest to assisted transfer activities, non-weight bearing ambulation, toe touch, partial weight-bearing, weight-bearing as tolerated and finally full weight bearing.
2. There is no specific time for weight-bearing after a pelvic fracture. Decisions are in liaison with the orthopaedic team based on the type of fracture, type and quality of the fixation, bone condition, ability to control weight-bearing (eg. multiple injuries) and evidence of fracture healing.

Discharge planning

- Ensure communication and follow-up with orthopaedic surgery, urology, gynaecology, gastro-intestinal surgery and rehabilitation medicine (including physiotherapy and occupational therapy) teams as applicable.
- Make referrals to patients local area wheelchair services if applicable.

Outcome measures/ assessment tools

- American Spinal Injuries Association Scale (ASIA)

References

Brammer CM and Spires MC, *Manual of Physical Medicine and Rehabilitation*, Hanley & Belfus Inc, PA (2002)

O'Young BJ, Young MA and Steins SA, *Physical Medicine and Rehabilitation Secrets*, 3rd Ed, Mosby Elsevier, PA (2008)

08 • Rehabilitation

08.f • Traumatic limb loss: management guidance

Trauma accounts for 20–25% of lower limb amputations, while it is the most common cause of upper extremity amputations. Amputations can occur at different levels, details of which are beyond the scope of these guidelines. Please find below some general considerations.

Clinical management issues to consider

Involve rehabilitation team prior to surgery to discuss stump length and type if required

- date, level and cause of amputation
- details and recommendations of surgical team involved
- potential complications – tissue viability, infection etc
- removal of drains, date for removal of clips / stitches
- documentation of neurovascular status of limbs
- plan for review of stump wound plus change of dressings – soft vs rigid, vac dressings
- documentation of fractures plus review of X-rays with potential impact on mobility
- current management of stump and phantom pain

Throughout admission

- monitor stump wound healing
- control stump volume, eg. Juzo® shrinking sock
- clarify with the trauma team regarding weight bearing status, the management and monitoring of other associated injuries if applicable
- monitor nutrition (use weight chart and MUST scoring chart)
- identify if there is a need for psychological support
- physiotherapy involvement – maintenance of range of movement (ROM) of joints of amputated limb (prevent contractures) plus strengthening exercises, aerobic conditioning, mobilisation (eg. P-PAM aid/Femurette) and balance training with consideration of other injuries / issues
- OT involvement regarding personal care and assessment for provision of wheel chair if applicable

Discharge planning

- OT access visit if applicable plus follow up plan including vocational aspect
- make referral to patients local area wheelchair services if applicable
- physiotherapy follow up plan
- wound follow up if necessary
- amputee primary clinic appointment

Outcome measures/ assessment tools

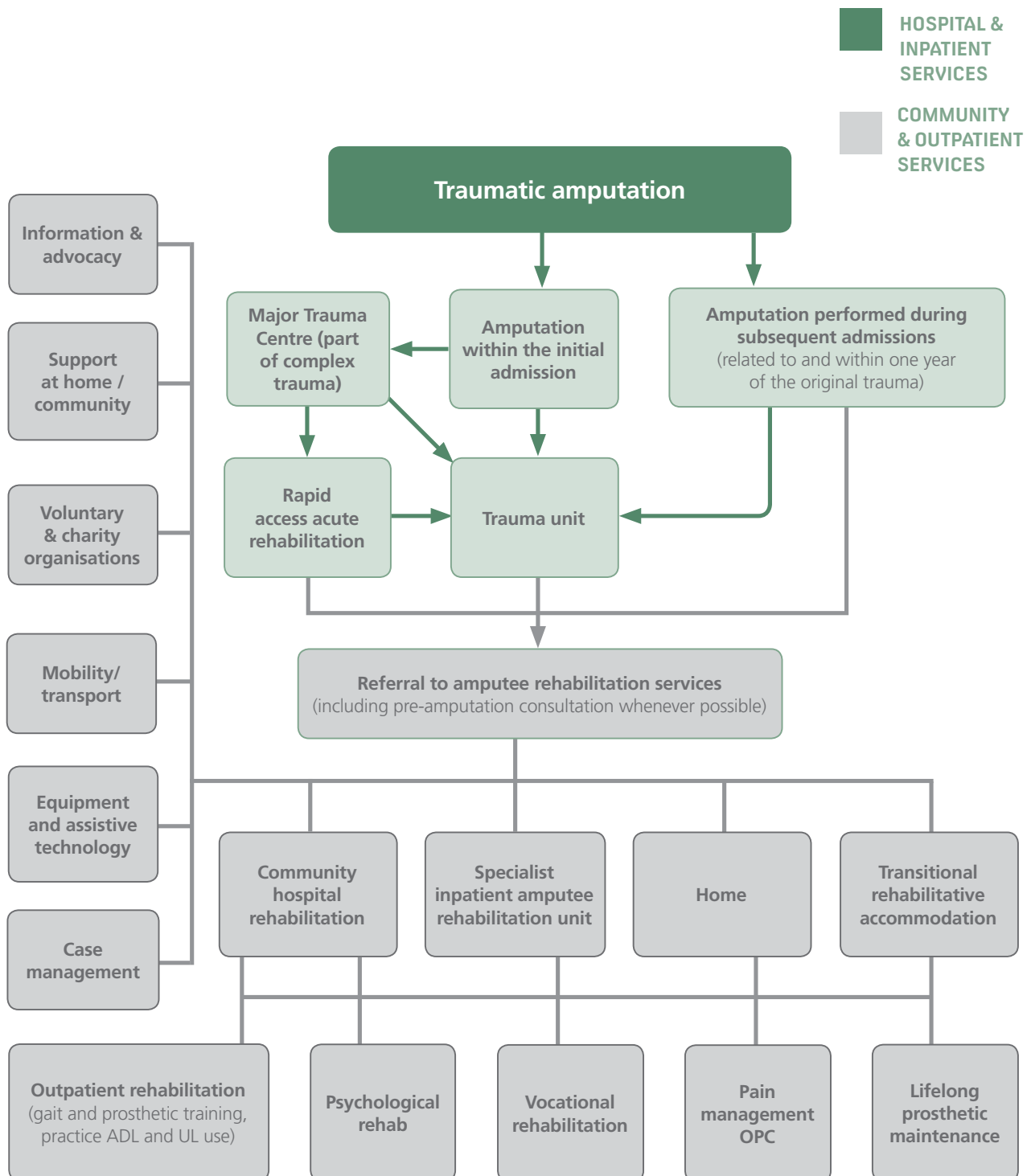
- weight chart
- MUST scoring chart

References

BSRM Amputee Rehabilitation: Recommended Standards & Guidelines (2nd edn), (October 2003)

08.f.i • Traumatic limb loss

Pathway



Based on the model developed by the Eastern Head Injury Group; Pickard, Seeley, Kirker et al, *Journal of the Royal Society of Medicine* (August 2004)

08.g • Complex orthopaedic injuries: rehabilitation guidance

Orthopaedic injuries incorporate a wide spectrum of injuries, from soft tissue injuries alone to complex fractures. These injuries may be multiple and have to be managed with knowledge of the patient's pre-existing medical conditions, level of function as well as independence with an aim to restore pre-morbid status.

Clinical management issues to consider

Obtain knowledge regarding:

1. mechanism of injury
2. type of soft tissue injury / fracture
3. orthopaedic treatment received:
 - review X-rays / CT scans / MRI scans
 - review operation report if applicable
 - discuss details of operative findings with orthopaedic surgeon (eg. quality of fixation achieved and bone quality) as this can affect rehabilitation progression and timing, check X-rays
4. normal course of healing for that injury/fracture, complications and expected outcomes

Acute stage management principles: PRICE

P protection / pain relief

R relative rest

I ice

C compression

E elevation

Rehabilitation MDT goals:

1. pain relief:
 - pain relief ladder: paracetamol, NSAIDs, opiates
 - consider analgesia prior to physiotherapy or OT session
2. correct deformity
3. protect injured tissue
4. prevent complications
5. restore range of movement (ROM)
6. muscle strengthening
7. personal care and ambulation retraining
8. consideration for investigation, prophylaxis or treatment of osteoporosis

Watch out for complications:

1. local:

- nerve damage: consider nerve conduction studies +/- liaison with specialist orthopaedic or neurosurgery team
- blood vessel damage: monitor circulation and liaise with vascular surgery team
- compartment syndrome: suspect this if patient complains of severe pain and paraesthesia of toes and fingers, inability to move toes and fingers and poor capillary refill. Liaise with orthopaedic team immediately as fasciotomies might be needed.
- stiffness of joints and muscle atrophy
- wound infection (especially in open fractures) – swab for culture and sensitivity (C&S) and start systemic antibiotics
- pin site infection if an external fixator is used – swab for C&S and discuss with orthopaedic team starting systemic antibiotics
- metal work loosening or damage
- delayed union which can progress to non-union
- malunion: monitor for fracture redisplacement, especially in
 - fractures involving both the radius and ulna
 - comminuted fractures
 - oblique fractures
 - fractures treated with a cast as this can become loose when swelling decreases

2. systemic:

- deep vein thrombosis (DVT) / pulmonary embolism (PE)
- anaemia
- fat embolism
- pneumonia
- urinary tract infections
- constipation
- pressure sores

Mobilisation:

1. Can be a progression from complete bed rest to assisted transfer activities, non-weight bearing ambulation, toe touch, partial weight-bearing, weight-bearing as tolerated and finally full weight bearing.
2. Consider the need for a brace in, eg. spinal and knee injuries.
3. There is no specific time for weight-bearing after a pelvic or lower limb fracture. Decisions are in liaison with the orthopaedic team based on the type of fracture, type and quality of the fixation, bone condition, ability to control weight-bearing (eg. multiple injuries) and evidence of fracture healing.

Discharge planning

- Ensure communication and follow-up with orthopaedic surgery, vascular surgery, neurosurgery and rehabilitation medicine (including physiotherapy and occupational therapy) teams as applicable.
- Make referral to patient's local area wheelchair services if applicable.

References

Brammer CM and Spires MC, *Manual of Physical Medicine and Rehabilitation*, Hanley & Belfus Inc, PA (2002)

O'Young BJ, Young MA and Steins SA, *Physical Medicine and Rehabilitation Secrets*, 3rd Ed, Mosby Elsevier, PA (2008)

08 • Rehabilitation

08.h • Tracheostomy care guidance

The goal of caring for a patient with a tracheostomy is to ensure that the airway is maintained at all times.

Clinical management issues to consider

- establish indication for tracheostomy and patency of upper airway
- note date of tracheostomy insertion
- note size of tracheostomy tube
- inspect tracheostomy site
- ensure that equipment required (including tracheostomy safety box) is at the bedside and accompanies the patient if transferred off the ward

Daily care interventions to ensure the patency of the tracheostomy tube

Humidification

Breathing through a tracheostomy bypasses the normal warming, filtering and humidification of inspired air.

All tracheostomy patients will require a form of artificial humidification.

- Deliver heated circuit humidification to immediately post-operative neck breathers.
- Assess humidification effectiveness by observing tenacity of secretions and ease at coughing and clearing secretions.
- Effective humidification will allow loose secretions to be easily cleared on coughing or suction.

Nebuliser

- ensure that humidified oxygen and nebulisers are prescribed
- dispense one 5ml saline ampoule into nebuliser chamber
- ensure tracheostomy mask is clean, place mask over tracheostomy tube and secure
- turn on, ampoule will take approx 5–10 mins to disperse
- when finished turn off, remove and dry mask with paper towel
- saline nebuliser should be used 4–6 hourly. However, if secretions are dry nebulisers can be increased in frequency to 2 hourly to loosen and moisten secretions. If dry secretions persist contact tracheostomy nurse specialist
- ensure patient is well hydrated if secretions remain thick
- change nebuliser kits as per manufacturers' guidelines

Inner tube cleaning

- remove tracheostomy aids, eg. speaking valve or Swedish nose / trachphone if being used
- with one hand supporting the outer tube, remove the inner tube using a curved downward motion
- insert spare, clean inner tube with one hand supporting outer tube reinsert the inner tube using an upward curved motion
- using the tracheostomy cleaning brush or swab, clean the inner tube with sterile water until no secretions remain
- tap any excess water off tube and store in a clean pot
- ensure tube has clicked into place

08.h • Tracheostomy care guidance

- reapply tracheostomy aid if being used
- inner tube should be cleaned 2–4 hourly. However, frequency of cleaning should increase if required, eg. when secretions increase due to a cold or chest infection or if secretions are dry (if secretions become dry, humidification should be increased, ie. saline nebuliser (up to 2 hourly/5ml ampoule)
- all tracheostomy care given should be recorded on the tracheostomy care chart
- ensure patient has call bell, pen and paper or another aid to communicate with staff / relatives

Suctioning

- ensures suction apparatus is working and suction chamber is not full
- suction pressure should be between 13.5 and 20kPa (100–150mmHg)
- wear non-sterile gloves
- connect suction catheter to suction tubing – see below

Inner diameter of tracheostomy tube (mm) (NB: see manufacturers details to confirm)	Suction catheter	
	FG	(mm)
10mm	14	(4.5)
9mm	14	(4)
8mm	12	(4)
7mm	12*	(4)
6mm	10	(3.3)

* It is more appropriate to use a size 12 catheter as although it is slightly larger than ½ the diameter it is more effective for secretion removal.

- insert suction catheter using a non-touch technique, to the length of the inner tube plus 1cm if patient able to cough, or to carina and draw back 1cm (1/3 of catheter length) if patient cannot cough. (See chart below.)

For patients unable to cough (approx 16cm on uni-medical marked suction catheter) (approx 22cm for adjustable flange tube (Uni-Perc))		For patients able to cough (approx 11cm on uni-medical marked suction catheters)	
Action Insert catheter to the depth of the carina or until resistance felt. Withdraw catheter 1cm and then apply suction	Rationale Withdrawal of 1cm limits suction causing damage to the carina	Action Insert suction catheter to the length of the tracheostomy tube plus 1cm	Rationale Patients will cough on suctioning so therefore do not need deeper suctioning

- occlude suction port with thumb to apply suction
- remove suction catheter steadily, this should take no longer than 15 seconds
- throw away used suction catheter and reattach new suction catheter if required for further suctioning
- if there are any signs of infection, eg. thick, green smelly secretions that are difficult to clear, inform doctors or tracheostomy specialist nurse to assess further

08.h • Tracheostomy care guidance

Tracheostomy dressing

- Remove dressing and clean around stoma site with normal saline and gauze, ensure that the flange of the tube is clean and any crusting removed.
- Observe stoma site for signs of redness, sores or ulceration. (If any of these are visible inform the doctors or tracheostomy nurse specialist to assess further.)
- Apply barrier cream around stoma site.
- Reapply clean tracheostomy dressing. Dressing should be changed daily, however, if required change more frequently.

Neck collar

When removing the tracheostomy ties, two people will be required, one to hold the tube whilst tapes are removed to prevent accidental decannulation.

- With one hand supporting the tube, carefully untie and remove the neck collar. Replace with a clean collar.
- Ensure that only two fingers fit down the side of the collar. If the collar is too loose the tube can become displaced.
- Collars should be changed daily. Where ventilatory support is required use ribbon tracheostomy ties.

Monitoring

- Baseline observations including oxygen saturation and respiratory rate are done at the required frequency
- Monitor daily for signs of DOPE: displacement, obstruction, pneumothorax / pneumonia, faulty equipment.

Accidental decannulation

DON'T PANIC!

Once the tracheostomy tube has been in place for about five days the tract is well formed and will not suddenly close.

- reassure the patient
- call for medical help

Ask the patient to breathe normally via their stoma while waiting for the doctor / anaesthetist. The stay suture (if present) or tracheal dilator may be used to help keep the stoma open if necessary.

- stay with patient
- prepare for insertion of the new tracheostomy tube
- once replaced, tie the tube securely

Check tube position by (a) asking the patient to inhale deeply – they should be able to do so easily and comfortably, and (b) place hand in front of the opening – you should feel the patient exhaling if in correct position.

Weaning

Tracheostomy weaning should be agreed by the Multi Disciplinary Team (MDT) and specific, individual care plans put in place by the Tracheostomy Nurse Specialist and Speech and Language Therapy (SLT).

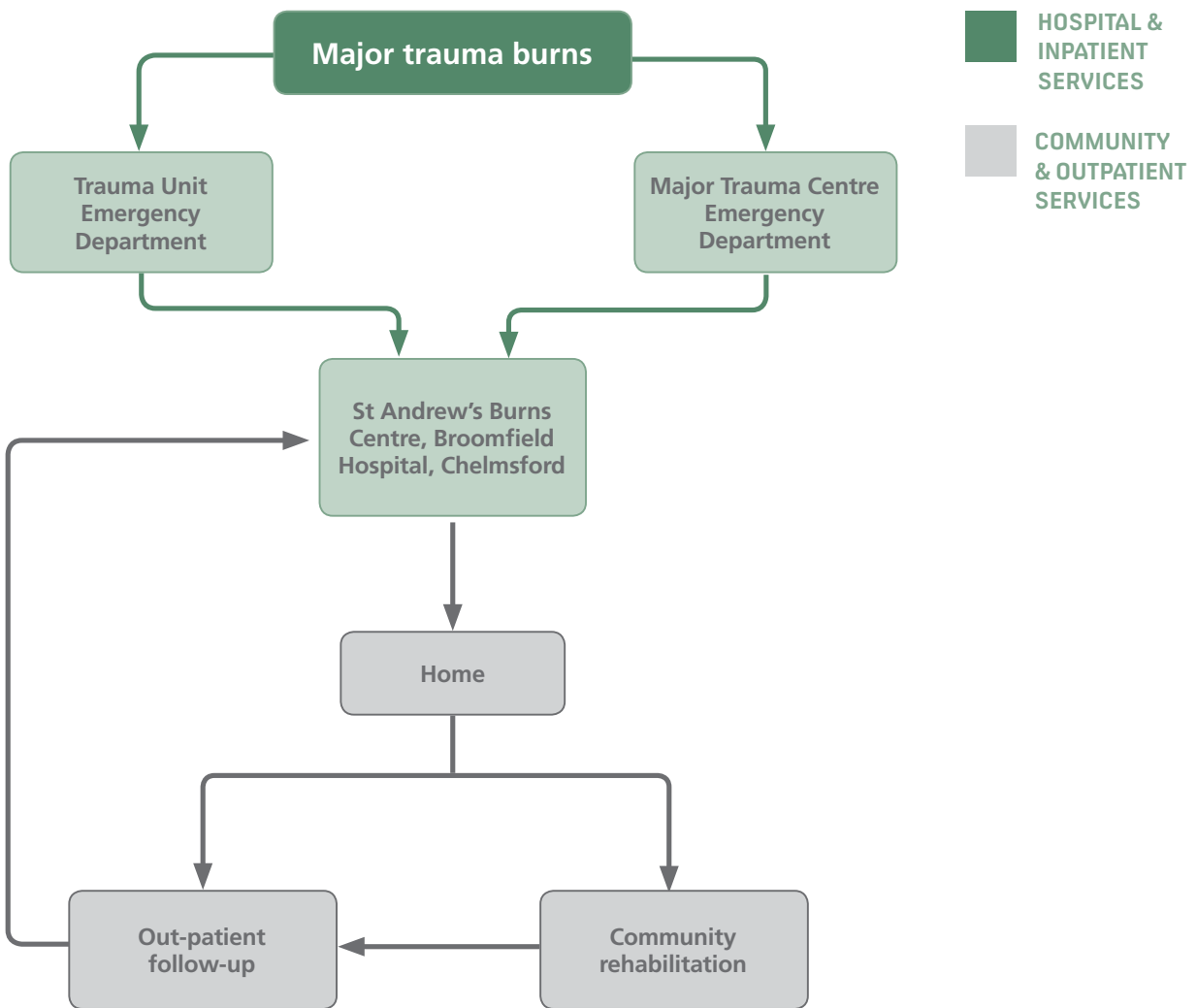
Liaise with Major Trauma Centre (MTC) consultant nurse specialist in tracheostomy care as required

Contact:
01223 348679 or
bleep 152-459

References

- Addenbrooke's Tracheostomy Care Guidelines
- www.tracheostomy.org

Pathway



Based on the model developed by the Eastern Head Injury Group; Pickard, Seeley, Kirker et al, *Journal of the Royal Society of Medicine* (August 2004)

08 • Rehabilitation

08.i.ii • Burns rehabilitation guidance

Modern burn care is a multistage process and can be divided into four phases. Rehabilitation begins from Day 1 as achieving optimal function is a goal that needs to be considered at all phases:

- **Phase 1 (Days 1–3):** Initial evaluation and resuscitation. Evaluation of percentage and degree of burns (Rule of nines, Lund and Browder chart), other injuries (eg. airway) plus co-morbid conditions. Airway maintenance, accurate fluid resuscitation as well as Hb monitoring +/- blood transfusion is required. Specific wound dressings are usually required as advised by plastic surgery team.
- **Phase 2 (first few days post injury):** Staged operations for wound excision/ debridement, cover and closure.
- **Phase 3:** Definitive wound closure (including replacement of temporary wound covers) and reconstruction of high complexity areas such as the face and hands.
- **Phase 4:** Reintegration

Clinical management issues to consider

In acute burn rehabilitation

- Management is individualised by burn location, depth of injury, percentage of body surface injured, associated injuries (eg. airway, fractures), complications and patient's previous functional level and health.
- Burn patients with inhalation injuries may have a tracheostomy and are at risk of developing:
 - pneumonia
 - adult respiratory distress syndrome
 - multisystem organ failure.
- Patients who suffered an electrical injury may be susceptible to:
 - myocardial necrosis (consider CK monitoring)
 - arrhythmias (consider ECG monitoring)
 - peripheral and central nervous system complications (consider MRI scans, EMG studies etc).
- Patients with burn injuries may be in a catabolic state (especially if burn injuries are >30% total body surface area (TBSA)).
 - Address nutritional needs. Dysphagia can be an issue. Early enteral feeding and dietician input is essential (daily caloric requirements for adults: 25kcal/kg plus 40kcal/1% TBSA burn/day).
 - Monitor for metabolic abnormalities and increased insulin resistance. Monitor FBC, electrolytes, LFTs and bone function tests, blood glucose and inflammatory markers (ESR, CRP).
- consider and address sleep disturbances
- consider psychology / psychiatric input as necessary
 - consider previous history
 - patient might suffer from post-traumatic stress disorder or depression
- Promote wound healing (liaise with plastic surgery team / tissue viability nurse regarding appropriate dressings to use at every stage. Do not forget donor sites).
- Prevent complications such as joint contractures, weakness, decreased endurance and loss of functional abilities. Heterotopic ossification is another complication but preventative management is controversial.

Wound care principles

- decrease pain
- prevent infection
- prevent and suppress scarring
- prevent contractures
- prepare wounds for grafting if necessary

Positioning principles

- fundamental to prevent contractions and compression neuropathies
- patients usually adopt positions of comfort namely flexion and adduction
- keep tissues in an elongated state
- ideally, positions of extension and abduction should be chosen but these need to be individualised to the patient's specific injuries

Splinting principles

- used to prevent joint contractures (eg. joints with overlying deep partial thickness or full thickness burns are at risk), maintain proper positioning and protect new skin grafts
- should be done with functional goals in mind
- can be done with off the shelf or custom made splints
- a good splint:
 - is easy to don and doff
 - avoids pressure on bony prominences and nerves
 - is made of remoldable materials and can be modified according to the patient's needs (review splinting as necessary)
 - is compatible with wound dressings and topical medications
 - exercise principles
- initial goal is to maintain range of movement (ROM) and strength
- programme depends on stage of wound healing, skin graft status (if applicable) and patient's participation ability. Consult plastic surgeon as necessary
- stretching programme is indicated when there is loss of ROM
- once ROM is achieved, active exercise is preferred
- strengthening / endurance training should begin as tolerated
- do not forget analgesia

Early ambulation principles

- maintains independence, balance, lower extremity ROM and decreases risk of DVT
- if lower limb skin grafting is present, do not start ambulation until a stable circulation of the graft sites is established – discuss with plastic surgeon first
- prior to walking, begin with dangling the lower extremities to assess if the graft tolerates the dependent position
- discuss the use of compression with plastic surgeon
- check the graft before and after dangling/walking
- monitor for gait deviations which may be due to pain, focal or generalised weakness, contractures, impaired sensation/proprioception or central nervous system causes

Discharge planning

- Ensure plastic surgery, physiotherapy, OT, nursing and psychiatric / psychology follow-up as necessary.

References

Brammer CM and Spires MC, *Manual of Physical Medicine and Rehabilitation*, Hanley & Belfus Inc, PA (2002)

Chan L, Harrast MA, Kowalske KJ, Matthews DJ, Ragnarsson KT and Stolp KA, *Physical Medicine & Rehabilitation*, 4th edn, Elsevier Saunders, PA (2011)

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Sheridan RL and Meier RH, *Burn Rehabilitation* (2010), <http://emedicine.medscape.com/article/318436-overview> [accessed on 29/02/12]

08.j • Spasticity management guidance (spinal cord injury and traumatic brain injury)

The technical definition is 'velocity-dependent increased resistance to passive limb movement in people with upper motor neurone syndrome' (Lance 1980).

At a clinical level, there are two main contributing factors to resistance to movement in the context of limb spasticity following damage to the brain or spinal cord:

- neurogenic component: overactive muscle contraction
- biomechanical component: stiffening and shortening of the muscle and other soft tissues

Harmful effects of spasticity include:

- pain
- difficulty with seating and posture
- fatigue
- contractures
- pressure sores
- deformity
- distress and low mood
- poor sleep patterns
- reduced function and mobility
- difficulty with self care and hygiene

Spasticity is not always harmful. Patients with a combination of muscle weakness and spasticity may rely on the increased tone to maintain their posture and aid standing or walking.

Clinical management issues to consider

Prevention of aggravating factors:

- pain or discomfort
- constipation
- infection (eg. urinary or respiratory tract infection, pressure sores etc.)
- tight clothing or catheter bags
- poor postural management

24-hour postural management programme

- document range of movement (ROM) of arms and legs (can patient feed self, lay down straight and sit in a chair?)
- consider a 'tilt in space' wheelchair if it facilitates early mobilisation

Physical therapy aims

- maintain muscle and soft tissue length across joints
- facilitate care giving (passive functional improvements)
- facilitate active control of any residual movements to allow for active participation in tasks (active functional improvements)

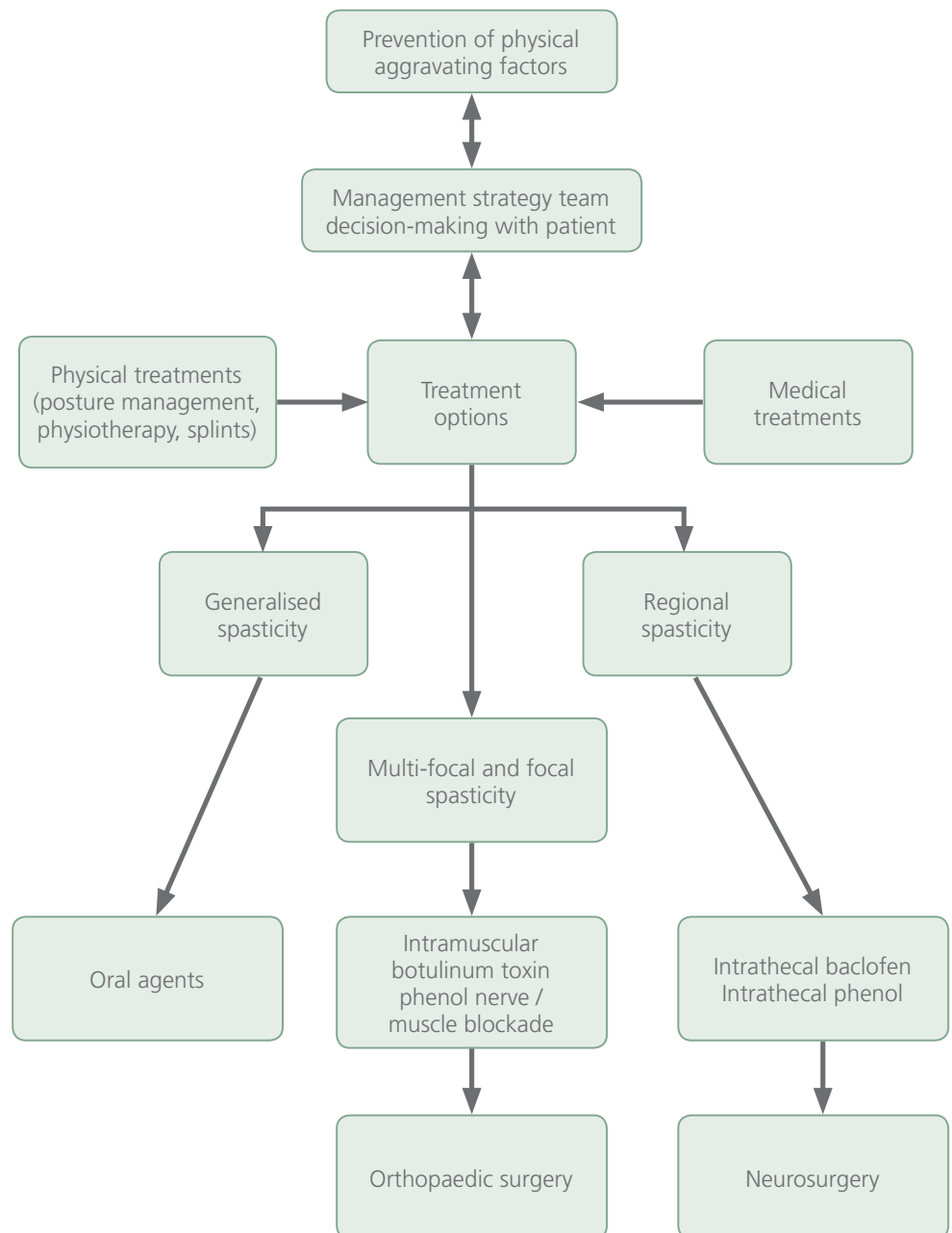
Medical treatment (in conjunction with physical therapy)

- consider whether the spasticity is actually harmful and what impact treatment will have in the patient's functioning
- consider pattern of spasticity: generalised, focal or multi-focal problems
- quantify spasticity using Modified Ashworth Scale

A management strategy can be a combination.

While formulating such strategy, consider:

- the different medications (eg. baclofen, tizanidine, gabapentin) and strategies available and their potential uses. If spasticity is combined with neurogenic pain, consider gabapentin as first choice
- mode of administration (pharmacology) and dosing / technique used
- mechanism of action of treatment(s) chosen
- side effects, precautions and potential complications



References

Spasticity in adults: management using botulinum toxin (National guidelines, February 2009)

Management strategy for adults with spasticity

(reproduced with permission from *Spasticity in adults: management using botulinum toxin*, National guidelines, Feb 2009)

08.k • Augmented nutrition (spinal cord injury and traumatic brain injury)

Clinical management issues to consider

Enteral feeding is a method of maintaining hydration and nutrition for patients who are suffering from a disability that affects the ability to take in an adequate oral intake to maintain nutritional status. A feeding tube is passed directly into the patient's stomach or small bowel and liquid nutrition is provided.

The decision to insert a gastrostomy tube should be made via consultation between the patient, next-of-kin or power of attorney, doctor(s) and staff. Consideration should be given to any advance care planning. The health care team, patient and representatives should consider the possible benefits of treatment as well as any risks or contra-indications.

Indications for a gastrostomy tube include:

- intact GI tract but unable to consume sufficient calories to meet nutritional needs
- impaired swallowing related to neurological conditions

Common risks of tube feeding include: pain at the tube site, local infection, aspiration pneumonia, tube occlusion, nausea, vomiting, constipation and diarrhoea. (rxkinetics, 2012)

Feeding regime

Patients requiring enteral feeding should be assessed, by a dietician to determine the most appropriate formula and feeding regime. The dietician should aim to meet the patient's specific nutritional requirements, minimise complications and maintain cost-efficiency.

Feeding regimes are either continuous or intermittent. Continuous feeds are indicated for patients who are at a high risk of aspiration, have gastro-intestinal tolerance (eg. diarrhoea) or for small bowel feeding. Feeds are either delivered by bolus, gravity flow or using pump-control. Bolus feeds are administered over 5–10 minutes, usually via a syringe. Bolus administration has the advantage of being a quick administration technique and frees the patient from tube lines.

Feeding formulas are made up of carbohydrate, protein, fat, minerals and vitamins including sodium and potassium; and fibre free water is also an important component and constitutes up to 85% of the formula. Selection of a formula type depends on the patient's nutritional requirements, gastrointestinal function, and any special disease considerations. The most commonly used formula products are lactose-free. Enteral feeds can be administered using a ready-to-hang feeding system ('closed system'), or decanted ('open system') into a feeding bag or syringe.

Weekly or twice weekly weighing is more effective than daily weighing, which is influenced by variations in fluid balance. (NICE 2006)

Outcome measures/ assessment tools

- weight chart
- Malnutrition Universal Scoring Tool (MUST)

References

Nutrition Support for Adults Oral Nutrition Support, Enteral Tube Feeding and Parenteral Nutrition (NICE guidance, 2006)

Guidelines for the management for enteral tube feeding in adults (Clinical Resource Efficiency Support Team, 2004)

Rxkinetics, *Section 2 – Complications of enteral nutrition* (2012), http://www.rxkinetics.com/tpntutorial/2_3.html [accessed 20/02/12]

08.L • Paediatric rehabilitation guidance

General considerations

- It is important to recognise that the parents are experts on their child. It is also important to acknowledge their need for information. The presence of families who are well informed and participating in care is beneficial to the recovery of the child.
- In some instances the child may not be the only member of the family to be seriously injured.
- Even when the family are physically unharmed, the psychological impact is widespread and long-lasting.
- It is well recognised that children who suffer major trauma often have learning or behavioural difficulties and some come from dysfunctional families. Such parents may have poor coping mechanisms. This impacts on parents' relationships with staff caring for the child and they will require additional resources to help these families.

Clinical management issues to consider

- It is essential that there is an identified lead consultant to co-ordinate care (likely to be a paediatrician), liaising with other paediatric experts as necessary, eg. other paediatricians, paediatric neurologists, neuropsychologists and paediatric (general / neuro / orthopaedic) surgeons.
- Definitive planned surgery for amputations should be performed in consultation with the consultant in rehabilitation medicine and prosthetic services, allowing pre-amputation discussion with the child (if appropriate) and parents.
- Neuropsychology services should be readily accessible for children and young people with traumatic brain injury, to assess the degree or neurological damage and its impact on learning, memory and mental health. Programmes should then be based on these assessments to improve function in these areas and to provide liaison with educational psychology services and local clinical psychology services for ongoing rehabilitation.
- A Counsellor or social worker support should be available to liaise with and support families throughout the child's pathway of care.

Discharge planning

- Re-integration is paramount for children following major trauma and traumatic brain injury. Early and regular contact should be made with the local paediatrician, general practitioner and community multidisciplinary team so they can be involved in planning the long-term care of the child from an early stage. This must be an inclusive process involving all services and health professionals involved in the child's care. The rehabilitation team should advise on school needs and liaise with school services.
- Essential rehabilitation equipment, including wheelchairs and mobility devices, should be made available as soon as possible.

Outcome measures/assessment tools

- Glasgow Coma scale for Young Children
- WeeFIM – is a measure of functional abilities and need for assistance associated with disability in children aged 6 months to 7 years.
- COAT (Children's Orientation and Amnesia Test) – designed for children recovering from TBI. It assesses general orientation, temporal orientation and memory. A score within two standard deviations (SD) of the mean for age defines the end of post-traumatic amnesia (PTA).

References

Management of children with major trauma (NHS Clinical Advisory Group Report, February 2011)