



Standards for Specialist Rehabilitation of Spinal Cord Injury

September 2022

Context

NHS England brought together the eight spinal cord injury centres across England to develop a set of recommended standards for patients presenting with a traumatic or non-traumatic spinal cord injury. The set of standards have been developed to ensure a consistent pathway and clinical care for SCI patients from diagnosis to lifelong care.

Mr David Cumming
Consultant Spinal Surgeon
East Suffolk & North Essex NHS Foundation Trust

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Spinal Cord Injury Clinical Network – Standards of Care 2022

Core Standards for Specialist Rehabilitation following Diagnosis of a Spinal Cord Injury

Specialist rehabilitation is a critical component of the Spinal Cord Injury Pathway, without which the Major Trauma networks and Specialised Spinal Units will inevitably fail to function effectively. This document sets out core standards to define the most appropriate pathway and role of specialist rehabilitation.

The standards have been developed for the adult population. Children form a small number of spinal cord injury cases per year and although many of the standards will be the same, a separate document will be developed for this highly specialised area. There are several other pathways that are being developed and will be published alongside this document including adults with complex psychological and mental health needs and cauda equina syndrome rehabilitation.

These standards have been developed with input from specialists from all English SCI Centres and SCI charities:

Pathway	Chair	Centre
1. Acute Pathway	Glynis Peat	The Golden Jubilee Regional Spinal Injuries Centre
2. Rehabilitation during first admission	Benita Hexter	The London Spinal Cord Injury Centre
3. Discharge Criteria and planning	Aheed Osman	Midland Centre for Spinal Injuries
4. Lifelong follow-up and readmission	Michelle Conlon	The London Spinal Cord Injury Centre

The aim of the clinical groups involved were to identify standards and a common model that could be used across all the NHS England Spinal Cord Injury Centres (SCIC), and include representation from a range of professional groups.

Objectives

- To develop an acute pathway to ensure optimal identification and care for all acute spinal cord injury patients including traumatic and non-traumatic causes. All patients in a major trauma or acute spinal hub centre will be referred to a SCIC as per guidelines, and managed on a specific pathway until fit for transfer and a rehabilitation bed is available.
- To agree recommendations for all aspects of rehabilitation care during the first admission to an SCIC in order to provide optimal care.
- To optimise the discharge process to enable safe transfer of care and prevent delays.
- To define lifelong care for individuals with a spinal cord injury and how this will be provided to minimise long term complications.

Acute Pathway

Chair: Glynis Peat - The Golden Jubilee Regional Spinal Injuries Centre

1.1 All patients admitted to acute hospitals in England who are identified as having a spinal cord injury, traumatic or non-traumatic, must be referred to the link spinal cord injury centre within 24 hours using the electronic referral system.

The principle is that all patients who have a spinal cord injury should have a lifetime of personalised care that is guided by a spinal cord injury centre.

The following standards regarding referral for all **traumatic** injuries must be followed. It is advised that national standardised templates are used in the acute care of all patients (Appendix 1).

1.2 For patients in a trauma centre or unit who have a spinal cord injury, the trauma team leader should immediately inform the specialist spinal surgeon on call in the trauma unit or nearest major trauma centre.

1.3 For patients who have a spinal cord injury, the specialist spinal surgeon at the major trauma centre or trauma unit should refer to the linked spinal cord injury centre within 24 hours of diagnosis to establish a partnership of care. Where appropriate consultant to consultant discussion is advised.

1.4 The initial assessment and care of all traumatic spinal cord injury patients should follow the guidelines set out in NICE guidance NG41 and BOAST Guidelines: <https://www.nice.org.uk/guidance/ng41/chapter/Recommendations#communication-with-tertiary-services>
<https://www.boa.ac.uk/resources/knowledge-hub/boast-8-pdf.htm>

1.5 All patients will have ISNCSCI (ASIA) chart completed within 6 hours of admission and weekly thereafter, while they continue in an acute setting.

1.6 ISNCSCI assessment should be completed prior to and following any surgical intervention and/or change in circumstance.

1.7 A joint review (outreach or inreach) with a SCIC clinician and member of the referring team should take place within 72 hours of referral and a plan of care agreed.

1.8 During the acute phase, regular review (every 48-72 hours) should be undertaken between the two services.

1.9 In the acute setting, patients must be cared for by staff with experience and knowledge of spinal cord injuries. A designated nurse and physiotherapist based in the referring centre will liaise and work closely with the designated SCIC.

1.10 All patients should be advised of support that can be offered from national charities such as the Spinal Injuries Association, Backup & Aspire.

Spinal Cord Injury Centres (SCICs) provide specialised services to patients with non-progressive **spinal cord injury or cauda equina injury** as a result of a traumatic or non-traumatic cause.

Injuries which result from physical trauma e.g. road traffic accident, fall, penetrating injury are referred to as “traumatic” and injuries which result from disease or infection e.g. epidural abscess/haematoma, spinal cord infarct, monophasic transverse myelitis etc. are referred to as “non-traumatic”.

Conditions that are not routinely accepted for admission to an SCI centre

Progressive neurological conditions:

- Primary neoplastic disease of the spinal cord (excluding treated benign lesions)
- Chronic cervical myelopathy progressively deteriorating in the absence of trauma
- Demyelinating disease e.g. multiple sclerosis, neuromyelitis optica, acute disseminated encephalomyelitis etc. (except monophasic conditions)
- Guillain Barre Syndrome

Non progressive conditions:

- Congenital long term spinal disorder e.g. spina bifida

Patients who are unable to participate in a rehabilitation process due to:

- Significant cognitive dysfunction and poor executive functioning e.g. Alzheimer’s disease, vascular dementia, traumatic brain injury etc
- Significant co-morbidities e.g. patients with advanced stages of heart failure, COPD, CKD, metabolic disorder etc.
- Patients with functional SCI
- Spinal column injury, without spinal cord injury
- Active malignancy, including MSCC, with predicted low life expectancy or patients who are undergoing cancer treatment preventing them from active participation in rehabilitation at the time of acquiring a SCI

For patients with significant mental health needs, a decision not to admit to SCIC should only occur after review from the MDT including consultation with those who provide the psychological service in the SCIC and when someone’s pre-existing psychological needs might compromise their safety or the safety of other patients. People with mental health needs must have equitable access to specialist spinal cord rehabilitation. Active steps should be taken to enable an admission including employment of additional 1:1 nursing observation. An action plan outlining admission needs should be provided, including a plan to meet their psychiatric needs. Where observational or psychiatric support is required beyond that available at the SCIC, this will require discussion with local teams as to how to safely manage the patient (Appendix 2).

If eligible for SCIC care, the spinal cord injury centre MDT will decide on the appropriate care pathway: in-patient rehabilitation or outpatient review and follow-up.

1.11 The MDT will produce a written summary of the decision made and specific reasons if a patient is not accepted for in-patient rehabilitation.

Written recommendations may be given to the referring team. If other rehabilitation services are more appropriate, it may be required to have a further MDT or case conference between rehabilitation services to agree the most appropriate service and how all areas of rehabilitation will be addressed.

1.12 All patients must have a psychological health screen (Appendix 3) performed within the first 4 weeks of admission.

1.14 All patients must be medically fit prior to transfer. Each SCI centre has different capabilities, especially regarding respiratory function. Appendix 4 outlines the “fit for transfer” criteria for all centres.

Rehabilitation During First Admission

Chair: Benita Hexter - The London Spinal Cord Injury Centre

The aim of rehabilitation is that the patient achieves their potential or is in a position to progress effectively towards it with available post-discharge services.

Every centre will be involved in providing data to the national database as per the recommendations in this document. All SCI centres will be actively involved in the National Spinal Clinical Network and will engage with national standards and quality improvement.

Many aspects are essential to the care and rehabilitation of spinal cord injury patients. These are addressed below and recommendations made.

2.1 Spinal Cord Injury MDT

The MDT must include specialist and identified Case Manager/Keyworker, Consultant in Spinal Cord Injury, Dietitian, Nurse, Orthotist, Occupational Therapist, Pharmacist, HCPC registered Clinical/Counselling Psychologist and Liaison Psychiatrist, Physiotherapist, Speech and Language Therapist and Urologist

- 2.1.1 Patients will have a weekly timetable detailing their appointments
- 2.1.2 Patients will have a minimum of 15 hours rehabilitation per week (including MDT appointments, goal planning, case conferences, education etc.)
- 2.1.3 Patients will have 2-4 weekly goal planning with their MDT (including therapists, consultant, nurse, case manager and other professionals as indicated) to agree and monitor goals to meet the patient's needs (unless indicated otherwise for the individual). Family or other advocates may attend at the patient's request.
- 2.1.4 Patients will have a keyworker to facilitate communication, involvement of family and friends (as requested by the patient) and to act as an advocate, co-ordinating the rehabilitation process.
- 2.1.5 Patients will have a designated team member for discharge planning. These individuals will deliver or be able to sign post to support in regards to discharge planning (housing, equipment, care), benefits advice, co-ordinating DST, community liaison and referrals and co-ordination of case conferences and goal plannings.
- 2.1.5 Patients will have a mid-stay case conference with their MDT, community professionals, family and/or friends as specified by the patient, to outline discharge expectations and set estimated discharge date.
- 2.1.6 SCIC staff will be able to identify and support patients' psychosocial needs e.g. mood, adjustment issues, risk, substance use, cognition and behaviours that challenge and know how to escalate for specialist psychological intervention as needed. All staff to have basic (tier 1) skills and some staff to have advanced (tier 2) skills.

2.1.7 ISNCSCI (ASIA) assessments are undertaken by trained individuals

2.1.8 Rehabilitation should be undertaken over 7 days, weekend activity should include consolidating education, reintegration activities, independent and supported exercise programmes, focus on bowel and bladder management, functional tasks and family liaison.

2.2 Case Manager/Key Worker/Social Worker/Discharge Co-ordinator fulfil the following responsibilities:

- Discharge planning (housing, equipment, care)
- Benefits advice
- Co-ordinating funding applications
- Community liaison and referrals
- Co-ordination of case conferences and goal planning

2.3 Dietetics is an essential part of care for all spinal cord injury patients. Each patient must have the following as part of their care:

2.3.1 Implementation of a validated nutrition screening tool including measurement of body weight and body mass index to ensure nutrition screening is completed and reviewed on admission and weekly thereafter.

2.3.2. Consideration of the use of indirect calorimetry for assessing energy requirement after SCI.

2.3.4. Identification and management of those at risk of malnutrition, including both under- and over- nutrition (obesity defined by adjusted BMI as >22 overweight, >25 as obese).

2.3.5 MDT liaison and training on the importance and value of nutrition following SCI encompassing obesity, bowel management, pressure ulcers and pre-op optimisation.

2.3.6 Review of catering provision (nutritional content, menu planning) for SCI services.

2.3.7 Assessment and appropriate supplement prescription for macro and micro nutrients.

2.3.8 Documented surgical pathway for formation of gastrostomy.

2.4 Medical Management of spinal cord injury patients should be a national standardised approach. Consultants will fulfil the role of Responsible Consultant, in line with GMC guidance (2014).

2.4.1 Each centre will provide the availability of a consultant 24/7

2.4.2 The initial assessment and establishment of a management plan must take place on the day of admission

2.4.3 The consultant should inform the patient of their diagnosis, prognosis and SCI treatment options with the support of the wider MDT as required

2.4.4 A weekly MDT Ward Round will take place for team communication and to co-ordinate the development of a treatment plan.

2.4.5 The consultant is responsible to recommend investigations (including CT, x-ray, MRI, ECG and nerve conduction tests), to diagnose and prescribe treatment for associated complications and conditions and to optimise medically and surgically for participation in rehabilitation including:

- spinal stability and precautions
- spasticity management
- musculoskeletal interventions
- pain management
- autonomic dysreflexia management
- autonomic dysfunction including cardiac and blood pressure modulation
- bone density
- sexual function and fertility
- respiratory & ventilator management
- continence

2.4.6 All patients should have a bowel and bladder management plan as per guidance (page 19-22)

Spinal cord injury consultants will provide expert advice to healthcare personnel from within or outside their employing NHS Trust in primary and secondary care.

2.5 Nursing

Spinal cord injury patients have many complex needs. This means that the nursing challenges can be significant. The wards must be staffed within national guidance to ensure that care meets the patient's needs. This includes the following specific roles, but this list is not exhaustive:

- 2.5.1 Meet patient's care needs including hygiene, nutrition and hydration
- 2.5.2 Dispense prescribed medication including IVs
- 2.5.3 Assessment, treatment and recommendations for optimal skin care including; turning, pressure relief and postural alignment in bed, mobilising, weekly pressure area assessments, prevention or management of post injury skin complications and provision of equipment as per guidance (page 23)
- 2.5.4 Deliver bowel management programme as per guidance (page 19)
- 2.5.5 Deliver bladder management programme as per guidance (page 21)
- 2.5.6 Implement and evaluate respiratory treatment plan including nebulisers, positioning, cough assist devices, turning, ventilator management, assisted coughs etc.
- 2.5.7 Consolidate patient skills learnt in therapy into daily routine including mobility and activities of daily living (ADLs)
- 2.5.8 Venous thromboembolism (VTE) prophylaxis and identification
- 2.5.9 Educate and assess patients on prescribed medications progressing to self-medicating where possible
- 2.5.10 Assess, monitor and educate patients on signs and symptoms of autonomic dysreflexia, progressing to patient verbally self-directing care needs
- 2.5.11 Monitor patient weight weekly and support diet including management of gastrostomy feed delivery
- 2.5.12 Manage nasogastric and gastrostomy tubes
- 2.5.13 Monitor, interpret findings, manage, escalate and implement appropriate treatment of the deteriorating patient

2.6 Occupational Therapy (OT) & Physiotherapy (PT)

Spinal cord injury patients require a high level of therapy input in order to achieve their optimal goals in reasonable timeframes. This requires a high level of expertise and staffing to achieve.

- 2.6.1 All patients should be assessed by an OT and PT within 24 hours of admission to the spinal cord injury centre.
- 2.6.2 An average of 15 hours of occupational therapy, physiotherapy and technician rehabilitation per week should be delivered to each SCI patient.

The roles of the therapy team should include:

- 2.6.3 Upper and lower limb range of movement and strength assessment, treatment and recommendations including splinting, casting, orthoses, exercises and positioning
- 2.6.4 Assessment, treatment and recommendations for spasticity

- 2.6.5 Upper motor neurone and lower motor neurone electrical stimulation assessment and recommendations
- 2.6.6 Assessment and recommendations for 24 hour positioning
- 2.6.7 Cardio-vascular fitness assessment, treatment and recommendations made including FES ergometry, sport and swimming
- 2.6.8 Assessment, treatment and recommendations for upper limb protection
- 2.6.9 Assessment, treatment and recommendations for maximising potential for transfers and bed mobility to include getting on and off the floor, the bed, designated toilet device, car and functional transfers, rolling and lie to sit
- 2.6.10 Assessment, treatment and recommendations for maximising potential ambulation including orthoses, walking aids and body-weight support ambulation
- 2.6.11 Assessment, treatment and recommendations for personal activities of daily living including feeding, drinking, washing, grooming, dressing, toileting and writing etc.
- 2.6.12 Assessment, treatment and recommendations for domestic activities of daily living including shopping, cooking, laundry, cleaning, bed making etc.
- 2.6.13 Assessment, treatment and recommendations for pain management
- 2.6.14 Access to aquatic therapy
- 2.6.15 Travel and transport options discussed and onward referral made
- 2.6.16 Employment/vocation assessment and recommendation including manual activities requiring access to a workshop
- 2.6.17 Leisure and recreation assessment and recommendation including sport and swimming
- 2.6.18 Seating assessment and recommendations made to include:
 - 1. Head/chin/eye movement control powered wheelchair
 - 2. Upper limb controlled powered mobility
 - 3. Power assisted wheels
 - 4. Self-propelling wheelchair
 - 5. Postural management in sitting
 - 6. Tissue viability management in sitting
- 2.6.19 Assessment, treatment and recommendation for wheelchair skills, manual and powered
- 2.6.20 Communication and assistive technology for use of smart phone, tablet and computer trialled
- 2.6.21 Demonstration of environmental control systems and onward referral
- 2.6.22 Assessment for and recommendation of long term standing device (SCITL 2019)
- 2.6.23 Home and/or discharge environment assessed and recommendations made including equipment provision or referral
- 2.6.24 Assessment for and recommendations made for therapy follow-up
- 2.6.25 Patient education programme in support of problem solving and self-management

2.7 Orthotics

Orthotists with neuro-rehabilitation and/or spinal cord injury specialist competence and awareness of emerging technology are required within all SCI centres.

Orthotists must work as part of the MDT delivering prescription, provision and fitting of orthotics: including but not limited to bespoke and non-bespoke insoles, AFOs, KAFOs, corsets, LSOs, TLSOs, CTLSOs, UL devices, garments, contracture prevention and correction devices, cervical collars etc. These should be provided in a timely manner to avoid delays in rehabilitation and discharge from the SCI centre.

2.8 Psychological Health

2.8.1 Access to specialist psychological assessment (within 10 days of admission) and therapy during admission for all patients

2.8.2 Initial contact from psychosocial team member within 5 days

2.8.3 Assessment within 10 days to include:

- Psychological health screen using psychometrically validated and recognised tools to include screen for suicidality, anxiety, depression, substance use and cognitive impairment
- All patients to have access to specialist evidence based psychological treatment intervention in alignment with NSIC Stoke Mandeville SCI Psychological Health and Wellbeing Matched Care Intervention Pathway (Duff 2017) and include trauma based intervention
- Documented pathway for access to liaison psychiatry and other specialist services e.g. alcohol/substance dependence, pain, cognitive function including TBI, dementia and neurology
- Where suicidality is present, risk assessment, personal safety plan and treatment plan to be established
- Where motivation, engagement and/or progress in rehabilitation is a limiter of progress or changes, assessment and intervention provided to include self-esteem, self-efficacy, identity, substance use, cognition and mood
- Patients, families and carers offered support to develop self-management skills based on self-efficacy and emotional regulation principles, developing strategies to manage concerns and be empowered to be able to advocate for their own needs and able to seek the required support
- Peer support and peer mentoring available for all patients. Psychosocial team to lead on recruitment and organisation of this model within the SCIC
- SCIC will provide support services to meet the psychological and emotional needs of families and/or carers including referral to the BackUp Trust Family Mentoring and/or SIA or local services unless declined
- Psychological health psychometric screening and psychological assessment to be repeated prior to discharge
- Onward referral made as required to BackUp mentoring or SIA and telephone counselling

2.9 Respiratory

Respiratory care is required following spinal cord injury by patients requiring mandatory ventilation, with a tracheostomy, using non-invasive ventilation (except CPAP for sleep apnoea) and those with an active lower respiratory tract infection, requiring additional monitoring and intervention including manual techniques, increased frequency of cough assist device (CAD) and/or manual assisted cough (MAC).

2.9.1 The respiratory MDT team should include SALT, Dietitian, specialist anaesthetist/respiratory physician, PT and nurses

2.9.2 The nursing and physiotherapy-staffing ratio should follow national guidance in line with critical care recommendations:

Level 3 Critical Care beds may be required for patients during ventilator weaning or while ventilation parameters are being established (complex respiratory management +/- cardiovascular instability due to SCI associated autonomic dysregulation)

Level 2 Critical Care beds are provided for patients who remain intubated and ventilated, but have a ventilation plan established

Level 1 Critical Care beds are provided for those requiring non-invasive ventilation for reasons other than obstructive sleep apnoea (OSA)

(The Intensive Care Society 2022)

Respiratory care should be aimed at optimising function and long-term care by:

2.9.3 Respiratory assessment and intervention to include arterial blood gas sampling (ABG), end tidal/transcutaneous CO₂ monitoring and bronchoscopy

2.9.4 Admission and weekly monitoring of forced vital capacity (FVC) and peak cough flow (PCF) if FVC <2l

2.9.5 Cough and volume assessment, augmentation and recommendation to include manual assisted cough, manual techniques, lung volume recruitment (LVR) bags, breathstacking and mechanical insufflation:exsufflation (MI:E) e.g. cough assist devices

2.9.6 Respiratory muscle training

2.9.7 Sleep studies

2.9.8 NIV trial and recommendation when required for sleep disordered breathing

2.9.9 Cough assist device trial and recommendation for volume and secretion management

2.9.10 24 hour availability and documented plan for management of respiratory emergencies including secretion retention and unplanned decannulation

2.9.11 Documented pathway for access to critical care services when required

All ventilated and/or tracheostomy patients must have:

- 2.9.12 Documented pathway for timely access to tracheostomy and ENT services
- 2.9.13 MDT decision making process for cuff deflation, ventilator free breathing weaning and tracheostomy decannulation
- 2.9.14 Access to specialist imaging for diaphragm screening and assessment including fluoroscopic diaphragm assessment
- 2.9.15 Documented pathway for timely access to neurophysiology and neurology services for phrenic nerve assessment
- 2.9.16 Establishment of appropriate ventilation parameters
- 2.9.17 Domestic ventilator set up
- 2.9.18 Education for patient and all appropriate carers and relatives
- 2.9.19 Access to all rehabilitation opportunities as a non-ventilated patient

2.10 Speech and Language Therapy

Access to Speech and Language Therapy for a minimum of five days a week for patients with communication and swallowing difficulties on admission is mandatory and should be part of the MDT assessment.

- 2.10.1 A baseline assessment must include case history, cranial nerve assessment, secretion management, voice, communication (speech and language), cognition, oral health, swallowing, associated respiratory function and outcome measures.
- 2.10.2 The therapists may be required to undertake instrumental assessment (including as appropriate Videofluoroscopy (VF), Fibreoptic Endoscopic Evaluation of Swallow (FEES), Ultrasound, Manometry, Surface EMG) to provide assessment, treatment and recommendations for dysphagia rehabilitation, to support airway management and weaning as well as laryngeal function and patency.
- 2.10.3 The rehabilitation process should also include targeted and physiologically specific interventions e.g. biofeedback surface EMG, FEES, respiratory muscle strength training, oral trials, secretion management and oral care, breath support and voice, alternative and augmentative communication and above cuff vocalisation as required.
- 2.10.4 There should also be access to instrumental assessment of swallow either FEES (during acute phase when tracheostomy is placed and when patient extubated) and VF for returning to oral intake or to support tracheostomy and vent weaning.
- 2.10.5 The assessment of voice and breath support for adequate communication is essential.
- 2.10.6 Other areas will include rehabilitation of swallow and communication and advice on mouth care.

2.11 Education for Patients

2.11.1 All patients must have personal discussion(s) with or without family and friends (as patient desires) to explain their diagnosis and prognosis of spinal cord injury.

All SCICs to provide a relative or support day as part of the education process. The education required will change over time and will need to be available for lifelong support. The learning needs for the patient as well as friends and family should be considered. Different techniques will be required to ensure appropriate education for the patient and their support network.

2.11.2 A relative's day should be provided at least once per year.

2.11.3 A personal multi-disciplinary patient education programme should be provided through 1:1 and group education, peer support and self-directed techniques with varied resources to meet patient's preferred learning styles, including:

- tissue viability
- autonomic dysreflexia
- bladder management
- bowel management
- sexual function
- respiratory function and management strategies
- cardiovascular consequences of SCI and long term fitness planning
- shoulder protection
- posture and deformity
- wheelchair maintenance
- the spinal cord and spinal column and what happens when it is damaged, neuroprotection and recovery, spasms and spasticity
- accessing benefits
- returning to work and vocation
- living with personal carers
- mental health and coping, access to SCI support organisations
- pain
- infection prevention and sepsis
- medication
- living with spinal cord injury

- SCI specific nutrition including healthy eating and the role of diet in prevention of chronic nutrition related complications and weight management
- sleep hygiene
- swallowing and communication difficulties

2.12 Reintegration

Reintegration is an essential part of the management of a spinal cord injured patient.

2.12.1 Visits should be considered to community environments including leisure and retail venues as prioritised by patient. Further visits to their local area to familiarise patient access may include GP surgery, dentist, faith facilities, local shops, exercise venues or other places identified by patient in order to help problem solve initial access issues on discharge

2.12.2 Facilitation of overnight stay out of the SCI centre, at home or in an independent living assessment unit (local funding of care where required), is recommended during the end stages of the initial in-patient rehabilitation period

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2.13 Initial Mobilisation

The time to mobilisation following a spinal cord injury is an area of controversy that has led to different management plans and advice across the eight SCI centres in England.

The majority of centres advise to mobilise as soon as medically stable and when spinal stability has been achieved surgically or can be maintained through orthoses.

It is important for all aspects of healthcare, including acute centres (MTCs, Specialised Spinal Surgical Centres) and rehabilitation centres, that a consistent approach is agreed to prevent confusion and potential harm.

The aim of this document is to provide a guide to all those who are involved in the care of a spinal cord injured patient. All decisions need to be made in discussion with the patient and their relatives.

Recommendations

- All patients should be on bed rest at up to 30-degree incline/bed tilt until they are medically stable and their spinal column stability is achieved
- At all times the mean arterial pressure should be kept above 80mmHg and a systolic pressure above 90mmHg
- Prior to mobilisation a secondary spinal assessment should be performed and documented. This must include a review of all imaging with an MSK and/or Neuroradiologist
- Mobilisation could begin when the patient is medically and physiologically stable. Such mobilisation should occur only in a graduated manner, with close monitoring and documentation of blood pressure and neurology both before and after the mobilisation. Such mobilisation could be carried out by gradual inclination of the bed or use of tilt table
- If there are any concerns with blood pressure or deterioration in neurology during such mobilisation, the patient should be returned to flat bed rest and the process repeated after a few days
- If postural hypotension is an issue on mobilisation this may need to be controlled with appropriate medication, abdominal binders or prolonging recumbent rehabilitation
- SCI Centres should share comparative data and carry out a study to establish consistency in practice

2.14 Spinal Cord Injury – Best Practice Bowel Management in First Rehabilitation Admission

Aim of Management

The patient achieves a safe and acceptable level of continence through communication, education and informed joint decision making with their team.

1. Adequate number of appropriately trained staff and equipment to provide:
2. Assessment, treatment, education and recommendations for optimal bowel function, to include:
 - a. sacral segments assessed within 24 hours and repeated when indicated to evaluate for upper or lower motor neuron bowel programme
 - b. assessment on day of admission to include pre-injury bowel function and management since SCI
 - c. adherence to documented local procedure for management of constipation and faecal incontinence agreed and delivered by MDT
 - d. ward based staff to plan and commence bowel management programme on day of admission
 - e. daily documentation of method and result (volume and consistency) of bowel management
 - f. bowel management to include:
 - recommendations regarding regular routine and timing
 - dietary, fluid intake and medication advice and recommendation to optimise stool consistency
 - medication using laxatives including stimulants and softeners considered
 - optimisation of gastro-colic reflex
 - digital rectal examination (DRE)
 - consider use of rectal stimulant for UMN bowels
 - use of abdominal massage considered and recommendations made
 - digital rectal stimulation (DRS) for UMN bowels
 - digital removal of faeces (DRF)
 - the effectiveness of the bowel intervention assessed using DRE
 - g. management of bowels in bed assessed and recommendations made

- h. management of bowels in a seated position (on a toileting aid) assessed and recommendations made (to establish potential for spontaneous emptying, for self-management of bowels or use of trans-anal irrigation – manual intervention from others is not appropriate in a seated position)
 - i. recommendations made with regards to appropriate environment and equipment provision including access to facilities, bathroom layout, padded seats, commodes and shower chairs
 - j. assessment, treatment and recommendation for bowel retraining, positioning and optimising pelvic floor function
 - k. use of anal plugs considered and recommendations made
 - l. trans-anal irrigation considered and recommendations made
 - m. incontinence pads, constantly placed in underwear or in the bed, is not advocated due to risk of skin damage, continence should be managed in other ways
 - n. education and training to allow physical or verbal independence in bowel management
 - o. plan established and documented for patient accessing continence supplies after discharge
3. SCIC has surgical pathways agreed and documented including elective formation of stoma

Key Clinical Standards for Audit

- a. patients continent of bowel

Data

- i. PROM mentor tool and matrix
https://www.coloplast.com/Global/1_Corporate_website/Mentor%20tool/CPCC_Peristeen_HCP_MENTOR_Questionnaire_A4.pdf
https://www.coloplast.com/Global/1_Corporate_website/Mentor%20tool/CPUCC_Mentor%20Decision%20Matrix_Onepager_A4.pdf

Areas for future service development

- electrical stimulation of abdominals
- ano-rectal physiology studies

References

- SCIRE Bowel Dysfunction and Management (2014) <https://scireproject.com/evidence/rehabilitation-evidence/bowel-dysfunction-and-management/>
- Emmanuel A. et al (2020) Creation and Validation of a New Tool for the Monitoring and Efficacy of Neurogenic Bowel Dysfunction Treatment on Response: the MENTOR Tool
Spinal Cord;58(7):795-802 doi: 10.1038/s41393-020-0424-8

2.15 Spinal Cord Injury – Best Practice Bladder Management in First Rehabilitation Admission

Aim of Management

The patient achieves a safe and acceptable level of continence through communication, education and informed joint decision making with their team.

1. Adequate number of appropriately trained staff and equipment
2. Assessment, treatment, education and recommendations for optimal urinary and renal function, to include:
 - a. adherence to documented local procedure for use of catheter valve agreed and delivered by MDT
 - b. adherence to documented local procedure for TWOC agreed and delivered by MDT
 - c. adherence to documented local procedure for management of UTI agreed and delivered by MDT
 - d. ward based staff to commence intermittent catheterisation as soon as clinically appropriate for patients (this may be in the first weeks post injury)
 - e. consideration of other options of catheter free bladder management including reflex voiding aided either by pharmacotherapy or surgical intervention
 - f. education, training and a wide range of resources (various types of catheter etc.) to allow those who are able, to become independent or assisted in intermittent self-catheterisation
 - g. baseline ultrasound scan of kidney, ureter and bladder (USKUB), video urodynamics and renal function blood tests completed
 - h. ward based evaluation of pre- and post- void residual urine volumes
 - i. locally available surgical service to provide SPC insertion, cystoscopy, cystolithopaxy and administration of Botulinum Toxin to the detrusor
 - j. plan established and documented for patient accessing continence supplies after discharge
 - k. assessment, treatment and recommendation for optimising pelvic floor function
3. SCIC has agreed and documented surgical pathways for further surgical procedure e.g. bladder augmentation cystoplasty, Mitrofanoff, artificial urethral sphincters (AUS) and procedures for stress incontinence, if not available on site.

Key Clinical Standards for Audit

- a. patients achieve continence
- b. patients commence intermittent catheterisation 2/52 post-injury (when there is a reasonable possibility of long term intermittent self-catheterisation)
- c. supra-pubic catheters are inserted where indicated
- d. baseline USKUB undertaken
- e. renal function is evaluated by blood tests
- f. video-urodynamic studies undertaken

Data

- i. SCIM bladder components
- ii. Incidence of catheter blockage, UTI, urosepsis
- iii. PROM - Qualiveen or NAC criteria
- iv. Consider using ISCOS data sets for more detailed analysis
<https://www.iscos.org.uk/international-sci-data-sets>

References

- Abrams, P. et al (2007) Lower Urinary Tract – A Proposed Guideline for the urological management of patients with spinal cord injury *British Journal of Urology*:101:989-994
- Biering-Sørensen F. et al (2018) International Spinal Cord Injury Lower Urinary Tract Function Basic Data Set (version 2.0). *Spinal Cord Ser Cases*. 2018 Jul 6;4:60.
- Biering-Sorensen F. et al (2009) International urinary tract basic spinal cord injury data set *Spinal Cord* May;47(5):379-83
- Goetz, L.L. et al (2013) International spinal cord injury urinary tract infection basic data set *Spinal Cord* Sep;51(9):700-4
- NHSE (2018) Excellence in Continence Care <https://www.england.nhs.uk/wp-content/uploads/2018/07/excellence-in-continenence-care.pdf>
- NICE (2012) Urinary Incontinence in Neurological Disease <https://www.nice.org.uk/Guidance/CG148>
- Pannek J. et al (2018) International spinal cord injury urodynamic basic data set (version 2.0). *Spinal Cord Ser Cases*. 2018 Nov 1;4:98.

2.17 Spinal Cord Injury – Tissue Viability in First Rehabilitation Admission

Aim of Management

The patient does not develop pressure ulcers (PUs) and is well prepared to avoid them in the future.

1. Adequate number of appropriately trained staff and equipment
2. Assessment, treatment, education and recommendations for optimal tissue viability management, to include:
 - a. patient's skin visually assessed within 20 minutes of admission
 - b. Waterlow or equivalent skin integrity risk assessment completed and documented within 6 hours of admission and weekly thereafter
 - c. nutritional screen within 24 hours of admission
 - d. nutritional management plan established within 72 hours of admission
 - e. documented tissue viability care plan with 6 hours of admission
 - f. existing and acquired PUs:
 - documented using EPUAP 2014
 - incident report raised in line with local protocol
 - g. existing PUs
 - multiple grade 2, grade 3 or 4 PUs documented and reported according to the provisions of the Safeguarding Adults Protocol (2018)
 - existing grade 3 and 4 PUs reported back to referring Trust Governance Lead and Ward Manager
 - h. continence achieved and maintained as quickly as possible
 - i. assessment and recommendations for positioning in bed including mattresses, turning frequency and turning systems
 - j. assessment and recommendation for wheelchair and cushion to optimise posture and pressure relief on initial mobilisation and ongoing

k. patients provided education on the avoidance and initial management of pressure ulcers with an emphasis on making this information applicable to their daily life to include:

- nutrition
- SCI consequences on circulation and sensation and impact on tissue viability
- how to inspect their own skin (using mirrors and/or photos).
- how to evaluate and adjust or verbally instruct adjustment of posture in sitting and lying
- how to conduct or verbally instruct pressure relief manoeuvre in sitting for 2 consecutive minutes in every hour (Coggrave & Rose 2003)

l. where rehabilitation can progress no further due to protracted bed rest, interim placement is sought until bed rest is no longer required and the patient is re-admitted to conclude their rehabilitation

Data

- i. incidence and grade of PUs on admission
- ii. incidence and grade of PUs developed in SCIC
- iii. incidence and grade of PUs documented at follow-up clinics and
- iv. incidence and grade of PUs on re-admissions

Recommendations for development of further clinical guidance

- a. use of incontinence pads
- b. initial turning frequency and progression
- c. initial sitting duration and progression
- d. patients managed on bed rest if pressure ulcer cannot be fully off loaded in sitting
- e. dressings
- f. barriers
- g. vac therapy
- h. split natal cleft/moisture lesion management

References

Coggrave M.J. & Rose L.S. (2003) A specialist seating assessment clinic: changing pressure relief practice. *Spinal Cord*. 2003 Dec;41(12):692-5. doi: 10.1038/sj.sc.3101527. PMID: 14639449.

European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel (2014). Prevention and treatment of pressure ulcers: quick reference guide. Washington DC: EPUAP/NPUAP

NICE (2014) Pressure Ulcers : Prevention and Management

National Institute for Clinical Excellence (2005). The prevention and management of pressure ulcers.

Department of Health and Social Care (2018) Safeguarding Adults Protocol 2018

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/756243/safeguarding-adults-protocol-pressure-ulcers.pdf

Discharge Criteria and Planning

Chair: Aheed Osman – Midlands Centre for Spinal Injury

The initial rehabilitation admission phase is only the beginning of long-term care. It is essential that the patient, family and carers are prepared for discharge and that the patient is discharged in a collaborative manner. This will involve ensuring that the patient is physically and psychologically ready for discharge, with appropriate support from local services, appropriate wheelchair and seating, as well as points of contact and support as required.

This person-centred integrated approach must ensure that spinal cord injured patients are discharged from the centre with the optimum seating arrangement for their needs, and can then face the future with the confidence that comes from having a good wheelchair and cushion that supports their functional independence, reduces secondary care issues and enables them to lead the life they want to lead.

The discharge process and planning should start from the time of diagnosis, throughout their initial rehabilitation. This must be done in a collaborative manner with the patient involvement, family and friends (as desired), local services as well as specialist advice.

3.1 There are many parts to this process and the list below are only some areas that need to have a clear plan, to ensure that the patient is fit for discharge

- Medically stable
- VTE prophylaxis management regime established
- Medication administration method established
- Autonomic Dysreflexia awareness and management regime
- Tracheostomy care plan and management regime in place
- Ventilation care plan and management regime in place
- Inspiratory Muscle Training programme established
- Assisted cough method identified and management regime in place
- Swallow management plan established.
- Speech management plan established.

- Bladder continence management regime established:
 - Patients should have base line imaging for the renal tract
 - Baseline urodynamics.
 - Long-term bladder management established and agreed by the patient.
 - Plan should be in line with NICE guidance for neurogenic bladder
- Bowel continence management regime established
 - Long-term routine of the bowel has been established and agreed by the patient.
 - Bowel routine and method established and local support agreed if required.
 - Plan should be in line with NICE guidance for neurogenic bowel.
- Pain pharmacological management regime established
- Pain therapeutic management regime established
- Validated pressure area score on discharge
- Nutritional assessment and long-term plan established.
- Skin management regime established for bed
- Skin management regime established for wheelchair
- Nutritional plan for weight management established
- Sensory restoration and normalisation management regime established
- Spasticity medical management regime established
- Spasticity therapeutic management regime established
- Oedema management regime established

3.2 Referrals to the local relevant medical specialities must be completed prior to discharge. This may include specialists such as:

Respiratory physician for ventilated patients and most tetraplegics

ENT referral for patients with tracheostomy

Psychiatry referral for patients with mental health problems

3.3 Wheelchair provision is an essential part of rehabilitation. It is essential that an appropriate wheelchair is provided or hired by their Wheelchair Service.

- 3.4 At the point of discharge all patients must be seen by the liaison spinal cord injury nurse and a follow-up visit agreed within 2 weeks of discharge
- 3.5 Where needed a package of care must be in place with funding agreed. All essential equipment for activities of daily living such as transfers, bathing and access must be in place for a safe discharge. Where needed additional training will be provided to local health care teams to ensure appropriate manual handling, repositioning and therapy
- 3.6 Appropriate step down facilities may be required for discharge prior to final discharge home. This may be for several reasons, but any facilities must ensure that patient care is not affected and that this is for a defined period
- 3.7 On discharge, a multi-disciplinary summary (see example in Appendix 5), which includes the long term plan, must be completed before discharge. The summary should include the outcome measures on admission and discharge: ISNCSCI (ASIA). This should also include future follow-up and diagnostic tests required
- 3.8 The discharge report should be completed and forwarded to the referring consultant, general practitioner, local allied health staff and psychological services as required
- 3.9 Patients should be referred, as desired, for support from SCI charities including SIA, Back-up andd Aspire
- 3.10 Medical follow up after discharge should be carried out between 6-12 weeks according to the patient's condition. The date should be given to the patient before discharge
- 3.11 Discharge information must be made available to the primary carer, General Practitioner, local Nursing team, Physiotherapy/Occupational therapy teams and psychological aspect

Lifelong Follow-up and Re-admission

Chair: Michelle Conlon – The London Spinal Cord Injury Centre

4.1 Standardised timings for follow up care

In accordance with the national SCI service specification all centres are to have an agreed pathway for follow up care. (www.england.nhs.uk/wp-content/uploads/2019/04/service-spec-spinal-cord-injury-services-all-ages.pdf)

The ongoing health needs of those with SCI should be subject to surveillance by the SCIC MDT. Intervention and treatment should be undertaken locally where possible and by the specialist SCIC team when not.

Potential health needs include, but are not limited to:

- Autonomic dysreflexia, autonomic dysfunction of cardiovascular system, neurology, pain, tissue viability, bone density, weight management, tissue viability
- Bowel, bladder, sexual function and fertility, respiratory function, mental health and coping, function, mobility (wheelchair and ambulation), upper limb overuse complications, posture and seating, spasticity

4.1.1 Professionals providing outpatient assessment and treatment services should include medics, nurses, PT, OT, orthotics, SALT, dietetics, psychologists and psychiatrists

4.2 Medical Follow up (Consultant led to include MDT members as appropriate)

4.2.1 Once a patient is discharged from their first episode of care/rehabilitation, they should be reviewed in an outpatient setting at the following intervals. These appointments can be face to face, virtual or telephone clinics. It is recommended that a standardised proforma be used (Appendix 6)

- 6 – 12 weeks post discharge
- 6 months
- Then annually for 5 years
- Then every 2 years or as required

4.2.2 However, if any patient presents or contacts the centre with issues related to SCI they should be reviewed on an ad hoc basis

4.2.3 MRI or radiological procedures should only be performed when there is a clinical need i.e. neurological changes or new increased pain

4.2.4 The following assessments should be completed

- Expedited ISNCSCI 6 months, 1 year, 2 year post injury
- Psychological health screen (appendix 7)

4.2.5 Access to restoration clinics should be available e.g. nerve and tendon transfers, shoulder clinics, spinal cord implants

4.3 Urology Follow-up

This should take place at the same time as the agreed medical follow-up. Patients should have ultrasounds and urological reviews as per the NICE guidance (Urinary incontinence in neurological disease: management of lower urinary tract dysfunction in neurological disease 2012)

Where possible ultrasounds should be done in the patient's local hospital. This should be arranged through link nurses and staff employed to support SCI centres in the acute Trusts.

4.4 Clinical Nurse Specialists (can be MDT approach when deemed appropriate)

4.4.1 Patients should be able to access clinical nurse specialists for SCIC advice, urology, continence, fertility, sexual function, intra-thecal baclofen and tissue viability

4.4.2 Specialist clinics should be available for urology and continence procedures, as well as tissue viability follow up and pressure sore management

4.4.3 All ventilated and SCIC patients with respiratory needs should have access to reviews by the SCIC respiratory team

4.4.4 Patients with baclofen pumps should be regularly reviewed and have access to baclofen refill clinics

4.5 Patients admitted to general hospitals

4.5.1 Spinal cord injury centres need to support patients who are admitted to general hospitals by providing a robust outreach or inreach service, which can support education and training for general ward staff. All SCI individuals should be encouraged to contact their SCIC when they have a planned or unplanned hospital admission.

4.5.2 All SCICs are to offer a patient passport or care plan

4.6 Spinal Cord Injury Centre Re-admission Criteria

In accordance with national service specification, all centres will have an agreed local pathway for re-admission in the following domains:

4.6.1 Planned admissions SCI Centre

- Elective surgical admissions: Ring fenced beds for surgical admissions if the SCIC does not have designated additional surgical ward. Surgical interventions may include urology, colorectal, plastic surgery, intrathecal devices, and hand/limb surgery
- Investigative purposes, scans or procedures to investigate deterioration in neurology or functional loss
- Specific admission for a SCI component of care and management e.g. bowel, bladder, skin, AD and spasticity

4.6.2 second stage rehabilitation - top-up rehabilitation

Referrals can come from:

- a. second phase of rehabilitation following first admission to SCIC where rehabilitation was suspended or could not be completed at that stage
- b. Need can be established following 3-6-12 month follow up/global review clinic
- c. Referral via GP, other specialities, community OT or Physiotherapy teams
- d. Concern raised by spinal outreach/liaison nurses

Centres to maintain a waiting list for these patients and identify goals and agree length of stay prior to admission.

4.6.3 Emergency Admissions

SCI centres are not an emergency service, but can accept transfer after discussion with spinal outreach/SCI consultants. Emergency transfers should be explored and expedited if a patient experiences:

- a. failure of intrathecal device, if device implanted and/or managed by SCI centre.
- b. uncontrolled Autonomic dysfunction
- c. multiple SCI complex issues that cannot be managed in acute hospital despite specialist outreach input

4.6.4 Maternity care - SCI patient to remain under primary care of maternity and obstetrics with supplementary outreach support from link spinal cord injury centre.

Appendix 1: Acute Assessment Form

DATE OF INITIAL ASSESSMENT:		VISITING/ASSESSING CLINICIAN:	
------------------------------------	--	--------------------------------------	--

PATIENT DEMOGRAPHICS					National SCI Database Ref ID:		
Name		DOB		AGE		NHS NO:	

REFERRER INFORMATION					
Hospital/MTC		Ward		Contact No	
Date of Admission to hospital		Treating Consultant		Image Transfer confirmed	<input type="checkbox"/>

COMORBIDITIES									
Respiratory	<input type="checkbox"/>	Musculoskeletal	<input type="checkbox"/>	Abdominal/GI	<input type="checkbox"/>	Cardiovascular	<input type="checkbox"/>	Mental Health	<input type="checkbox"/>
Cancer	<input type="checkbox"/>	Diabetes	<input type="checkbox"/>	None	<input type="checkbox"/>	Unknown	<input type="checkbox"/>		

PAST MEDICAL HISTORY
Medical Complaints and Surgical History

CLINICAL STATUS

History of Present Complaint: *(preceding symptoms/situation, mode of SCI, immediate impact and treatment provided)*

INVESTIGATIONS AND INJURIES

Imaging	
Cardiac	
Respiratory (FVC)	
Blood	
Other	
Other / Associated Injuries	

INTERVENTIONS AND SCI MANAGEMENT PLAN

Diagnosis	
Surgical Intervention: spinal / non-spinal	
Non-Surgical Intervention	
Orthoses	
Other	

NEUROLOGY:	Has an ISNCSCI (ASIA) assessment been completed?	<input type="checkbox"/>	Name of Assessor	
Any pre-existing neurological condition?				

CURRENT CLINICAL SITUATION	
Stability – any divergent parameters (MEWS, bloods, CV)	
Mobilisation Status	
Therapy goals (acute phase) PT/OT	
MCA, DOLS, DNAR status/nursing observation required? (e.g. 1:1 to keep them safe), exhibited verbal or physical aggression, or tried to leave the ward without consent?	
Bladder Management	
Bowel Management	
Skin Management/Pressure Damage	

RESPIRATORY STATUS

Vented/Non Vented

O² Requirements

Physiotherapy intervention required

Other

BASELINE (*exercise tolerance, mobility, frailty score, PoC*)

INFECTION PREVENTION AND CONTROL ISSUES

PSYCHOLOGY AND MENTAL HEALTH

Known mental health/forensic history/suicidal ideation?

Any barriers/additional plan needed for engagement in rehabilitation?

Past and present MH professionals involved in patient care

Psychological screen (by 4/52 post injury)

<p>Pre-existing or current cognitive impairment? If yes, for adults complete a recognised cognitive test such as 6CIT, AMTS or MOCA. Where needed complete the local hospital delirium screen.</p>	
---	--

SOCIAL HISTORY / OTHER

<p>Alcohol, tobacco, recreational drug history and current use</p> <ul style="list-style-type: none"> • How often have you had 6 or more drinks containing alcohol on one occasion in the past year: • How often in the past year have you used an illegal drug or a prescribed medication for a non-medical reason: 	<p>Less than monthly / monthly / weekly / daily or almost daily – weekly or more positive screen</p> <p>Less than monthly / monthly / weekly / daily or almost daily – monthly or more positive screen</p>
<p>Family and support network</p>	
<p>Health status of patient spouse</p>	
<p>Household and property details</p>	
<p>Occupation</p>	
<p>Benefits</p>	

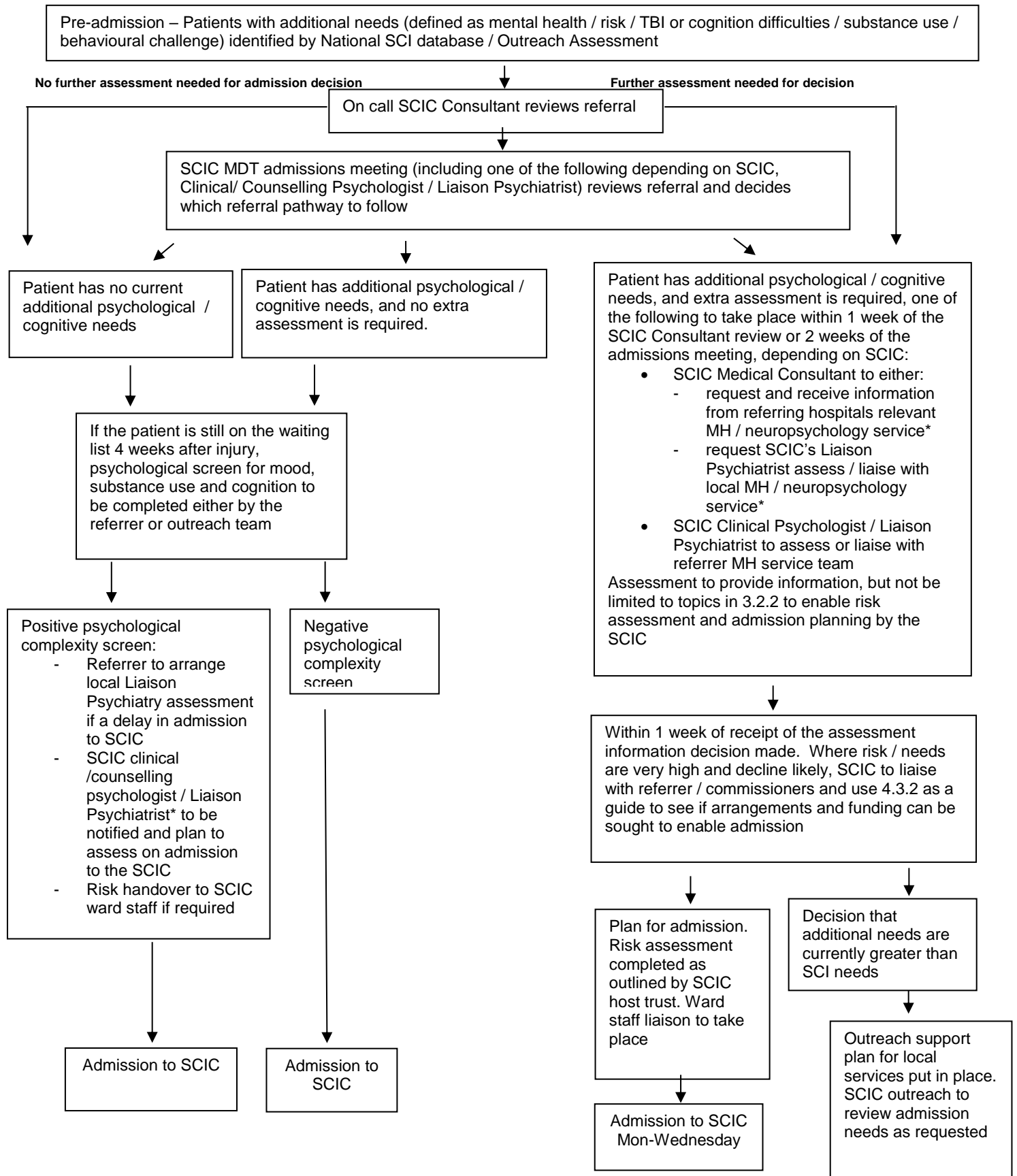
PATIENT DISCUSSION

Detail of Patient Discussion <i>(rehabilitation need, advice support, early prognosis discussion)</i>			
Discussion with Relatives		Relatives Contact Details	
Signposting and consent to refer to peer support (SIA, BackUp, Aspire, CESA)			
Safeguarding - child protection/domestic violence/ police involvement (passwords)			
Patient Understanding			
Patient Contact Details: Consent Taken <input type="checkbox"/>	Telephone/Mobile No		Email:

CLINICAL AND PATHWAY PLAN

Initial acceptance/pending status (to await rehab bed)	
In the case of patients who are not suitable for SCI bed – signpost to alternative pathway advice	
Summary of advice left	
Any outstanding treatment required: investigations, follow up	
OPD review	

Appendix 2: Psychological and Mental Health Outreach Flowchart



Appendix 3: Psychological Assessment Health Screen - 4 weeks after injury

Over the last 2 weeks , how often have you been bothered by the following problems? (Use “✓” to indicate your answer)	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Little interest or pleasure in doing things	0	1	2	3
4. Feeling down, depressed, or hopeless	0	1	2	3
5. Thoughts you would be better off dead or hurting yourself in some way	0	1	2	3

- QU: 1 and 2 - a summed score of 4 or greater is considered a positive screen
- QU: 3 and 4 - a summed score of 4 or greater is considered a positive screen
- QU: 5 – any response above 1 is a positive screen and patient needs referral for psychological/psychiatric assessment by local services

Appendix 4: Fit For Transfer to SCI Centre

FIT FOR TRANSFER CRITERIA		
1	Clinical evidence of infection/sepsis	
	Locally	Healed or healing wounds without evidence of wound infection, discharge, dehiscence
	Systemically	No evidence of active sepsis such as low blood pressure, temp above 38.5°, low urine output (as per sepsis screening tool)
Not in multi-organ failure		
2	Cardiovascular Stable cardiovascular function not requiring cardioactive drug infusions. Patients who have pre-existing or new onset cardiovascular dysfunction, severe enough to affect their ability to engage in rehabilitation would be considered not fit for transfer. Please confirm with recent echocardiogram in these patients	
3	Respiratory Stability Meets local/critical care network transfer guidelines and depends on facilities within the SCIC: <ul style="list-style-type: none"> Newly injured ventilator dependent via ETT/tracheostomy require critical care level 3 transfer. Newly injured ventilated via tracheostomy who require \geqFiO₂ 0.4 and/or PEEP>10 require critical care level 3 transfer. Newly injured patient ventilator dependent via tracheostomy could be admitted to level 2 HDU/respiratory bed if well established and settled on ventilator parameters and needing less than FiO₂ 0.4 to keep target SpO₂/PaO₂. Self-ventilating patients without the requirement of a ventilator but with a tracheostomy in situ should require less than 4-6L oxygen requirement. To follow local Trust Policy prior to transfer of such patients. Where patients are being transferred to ward based respiratory beds, the level of respiratory support required should be manageable in a non-high dependency/intensive care setting. This would include not requiring more than 3 instances of respiratory physiotherapeutic interventions a day and not being on parenteral antibiotics for treatment of a respiratory infection 	
4	Renal Stability stable renal function, or in absence, a clear management plan in place	
5	Mental Health Any changes or deterioration to mental health or cognitive functioning post acceptance will require agreed management plan and review	
6	IPC – as per national guidance	
7	Spinal Column Stability Should have been restored and if not, clear agreed management plans and precautions relevant to SCI rehabilitation should be established	
8	Completion of SCI Rehabilitation Prescription	
9	PACS transfer complete and discharge summary (including medication chart)	

Appendix 5: Example Discharge Report

	Completed & Checked by
Medical Team	
OT	
Physio	
Nursing	
Case Management	
Outreach	
Psychology	

Admission Date				
Discharge Date				
Diagnosis				
Date of Injury		Level of Injury on admission		Level of injury on discharge

Past Medical History/ Co-morbidities <i>(to be completed by Consultant)</i>	
Medical Summary <i>(to be completed by Consultant)</i>	
Annual Influenza Vaccination	
Due to this patient's spinal cord injury, please consider giving annual seasonal influenza vaccinations. This is especially important if the patient has a cervical or high thoracic neurological level, or any other risk factors as per NHS / NICE guidance for influenza vaccination.	

Psychological / Emotional <i>(to be completed by Clinical Psychologist)</i>
Altered State of Consciousness

Bowel Management	
Bladder Management	
Skin	
See attached neurological assessment, completed on:	

Level of Enablement
Wheelchair Skills
Bed Mobility
Transfers
Gait / Upright mobility (including mobility aids)
Exercise / Self-directed Exercise Programme
Carer Training (including date completed):
Additional Information

OSF usage (if appropriate)	
Size of frame	
Hip clasp type	
Knee belt height	
Independent in and out/ help needed and who is trained to help	

Follow-up physiotherapy required?	Yes / No
Follow-up contact details	

Community Occupational Therapist
Wheelchair Services
Upper limb Function
Personal Care
Domestic Skills
Cognition
Driving
Equipment In Situ
Environment

Appendix 6: Standardised Follow-up Proforma (example)

Patient Name:

Date:

Hospital no:

Diagnosis
Past Medical History
Current Medication
Recommended medication changes

Staff name & signature:

Patient Name:

Date:

Hospital no:

General Health
Bowel
Bladder
Skin
Pain
Spasticity
Respiratory
Physical Mobility e.g. walking, transfers
Bone Health e.g. Vitamin D Level, Dexa scan

Cardiovascular risk factors e.g. smoking, BP, lipids, diabetes mellitus
Other e.g. care/social support, autonomic dysreflexia, sexual function, nutrition
Psychological/adjustment concerns
Plan (i.e. follow up) e.g. Routine bloods: FBC, U&E, LFT, CRP, Lipids, HbA1C, Vit D, PTH, glucose e.g. Dexa scan

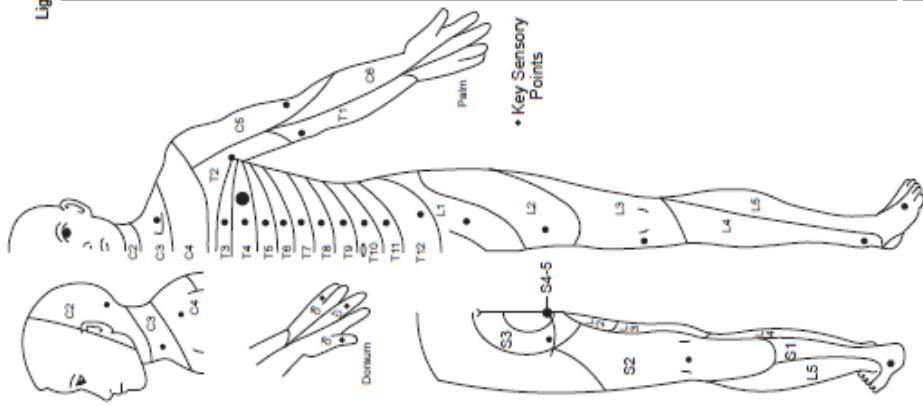
Staff name & signature:

Expedited ISNCSCI to be completed 6 months, 1 year and two years post injury

Psychological Health Measures

Patient Name _____ Date/Time of Exam _____
 Examiner Name _____ Signature _____

RIGHT		LEFT	
MOTOR KEY MUSCLES	SENSORY KEY SENSORY POINTS	MOTOR KEY MUSCLES	SENSORY KEY SENSORY POINTS
UER (Upper Extremity Right) C5 Elbow flexors C6 Wrist extensors C7 Elbow extensors C8 Finger flexors T1 Finger abductors (little finger)	Light Touch (LTR) Pin Prick (PPR) C2 _____ C3 _____ C4 _____ T2 _____ T3 _____ T4 _____ T5 _____ T6 _____ T7 _____ T8 _____ T9 _____ T10 _____ T11 _____ T12 _____ L1 _____ L2 _____ L3 _____ L4 _____ L5 _____ S2 _____ S3 _____ S4-5 _____	UEL (Upper Extremity Left) C5 Elbow flexors C6 Wrist extensors C7 Elbow extensors C8 Finger flexors T1 Finger abductors (little finger)	Light Touch (LTl) Pin Prick (PPl) C2 _____ C3 _____ C4 _____ T2 _____ T3 _____ T4 _____ T5 _____ T6 _____ T7 _____ T8 _____ T9 _____ T10 _____ T11 _____ T12 _____ L1 _____ L2 Hip flexors L3 Knee extensors L4 Ankle dorsiflexors L5 Long toe extensors S1 Ankle plantar flexors S2 _____ S3 _____ S4-5 _____
Comments (Non-key Muscle? Reason for NT? Pain? Non-SCI condition?): _____ _____ _____			
LER (Lower Extremity Right) Hip flexors Knee extensors Ankle dorsiflexors Long toe extensors Ankle plantar flexors	(VAC) Voluntary Anal Contraction (Yes/No) _____ RIGHT TOTALS (MAXIMUM) _____ (50)	LEL (Lower Extremity Left) Hip flexors Knee extensors Ankle dorsiflexors Long toe extensors Ankle plantar flexors	(DAP) Deep Anal Pressure (Yes/No) _____ LEFT TOTALS (MAXIMUM) _____ (50)
MOTOR SUBSCORES UER + UEL = UEMS TOTAL _____ (50) LER + LEL = LEMS TOTAL _____ (50) MAX (25) + UEMS TOTAL _____ (50) = PPR _____ (112) MAX (25) + LEMS TOTAL _____ (50) = PPL _____ (112)		SENSORY SUBSCORES LTR + LTl = LTTOTAL _____ (112) PPR + PPl = PPTOTAL _____ (112) MAX (56) + LTTOTAL _____ (112) = PP TOTAL _____ (112)	



SCORING ON REVERSE SIDE
 0 = Total paralysis
 1 = Palpable or visible contraction
 2 = Active movement, gravity eliminated
 3 = Active movement, against gravity
 4 = Active movement, against some resistance
 5 = Active movement, against full resistance
 NT = Not Testable
 0+, 1+, 2+, 3+, 4+, 5+ = Non-SCI condition present

SCORING ON REVERSE SIDE
 0 = Absent
 1 = Altered
 2 = Normal
 NT = Not Testable
 0+, 1+, NT+ = Non-SCI condition present

NEUROLOGICAL LEVELS
 Steps 1-6 for classification as on reverse

1. SENSORY	R	L
2. MOTOR		

3. NEUROLOGICAL LEVEL OF INJURY (NLI) _____

4. COMPLETE OR INCOMPLETE? _____
 Incomplete = Any sensory or motor function in S4-5

5. ASIA IMPAIRMENT SCALE (AIS) _____

6. ZONE OF PARTIAL SENSORY PRESERVATION (ZPP) _____
 (in injuries with absent motor OR sensory function in S4-5 only)
 Most caudal levels with any innervation

Muscle Function Grading

- 0 = Total paralysis
- 1 = Palpable or visible contraction
 - 2 = Active movement, full range of motion (ROM) with gravity eliminated
 - 3 = Active movement, full ROM against gravity
 - 4 = Active movement, full ROM against gravity and moderate resistance in a muscle specific position
 - 5 = (Normal) active movement, full ROM against gravity and full resistance in a functional muscle position expected from an otherwise unimpaired person
- NT = Not testable (i.e. due to immobilization, severe pain such that the patient cannot be graded, amputation of limb, or contracture of > 50% of the normal ROM)
- 0*, 1*, 2*, 3*, 4*, NT* = Non-SCI condition present*

Sensory Grading

- 0 = Absent 1 = Altered, either decreased/impaired sensation or hypersensitivity
- 2 = Normal NT = Not testable

0*, 1*, NT* = Non-SCI condition present*

Note: Abnormal motor and sensory scores should be tagged with a "" to indicate an impairment due to a non-SCI condition. The non-SCI condition should be explained in the comments box together with information about how the score is rated for classification purposes (at least normal / not normal for classification).

When to Test Non-Key Muscles.

In a patient with an apparent AIS B classification, non-key muscle functions more than 3 levels below the motor level on each side should be tested to most accurately classify the injury (differentiate between AIS B and C).

Movement	Root level
Shoulder: Flexion, extension, abduction, adduction, internal and external rotation Elbow: Supination	C5
Elbow: Pronation Wrist: Flexion	C6
Finger: Flexion at proximal joint, extension Thumb: Flexion, extension and abduction in plane of thumb	C7
Finger: Flexion at MCP joint Thumb: Opposition, abduction and abduction perpendicular to palm	C8
Finger: Abduction of the index finger	T1
Hip: Abduction	L2
Hip: External rotation	L3
Hip: Extension, abduction, internal rotation	L4
Knee: Flexion	L4
Ankle: Inversion and eversion Toe: MP and IP extension	L5
Hallux and Toe: DIP and PIP flexion and abduction	L5
Hallux: Adduction	S1

ASIA Impairment Scale (AIS)

A = Complete. No sensory or motor function is preserved in the sacral segments S4-5.

B = Sensory Incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-5 (light touch or pin prick at S4-5 or deep anal pressure) AND no motor function is preserved more than three levels below the motor level on either side of the body.

C = Motor Incomplete. Motor function is preserved at the most caudal sacral segments for voluntary anal contraction (VAC) OR the patient meets the criteria for sensory incomplete status (sensory function preserved at the most caudal sacral segments S4-5 by LT, PP or DAP), and has some sparing of motor function more than three levels below the ipsilateral motor level on either side of the body. (This includes key or non-key muscle functions to determine motor incomplete status.) For AIS C – less than half of key muscle functions below the single NLI have a muscle grade ≥ 3 .

D = Motor Incomplete. Motor incomplete status as defined above, with at least half (half or more) of key muscle functions below the single NLI having a muscle grade ≥ 3 .

E = Normal. If sensation and motor function as tested with the ISNCSCI are graded as normal in all segments, and the patient had prior deficits, then the AIS grade is E. Someone without an initial SCI does not receive an AIS grade.

Using ND: To document the sensory, motor and NLI levels, the ASIA Impairment Scale grade, and/or the zone of partial preservation (ZPP) when they are unable to be determined based on the examination results.



INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY



Steps in Classification

The following order is recommended for determining the classification of individuals with SCI.

- Determine sensory levels for right and left sides.**
The sensory level is the most caudal, intact dermatome for both pin prick and light touch sensation.
- Determine motor levels for right and left sides.**
Defined by the lowest key muscle function that has a grade of at least 3 (on supine testing), providing the key muscle functions represented by segments above that level are judged to be intact (graded as a 5).
Note: in regions where there is no myotome to test, the motor level is presumed to be the same as the sensory level, if testable motor function above that level is also normal.
- Determine the neurological level of injury (NLI).**
This refers to the most caudal segment of the cord with intact sensation and ambigiverty (3 or more) muscle function strength, provided that there is normal (intact) sensory and motor function rostrally respectively.
The NLI is the most cephalad of the sensory and motor levels determined in steps 1 and 2.

4. Determine whether the injury is Complete or Incomplete.

(i.e. absence or presence of sacral sparing)
If voluntary anal contraction = No AND all S4-5 sensory scores = 0 AND deep anal pressure = No, then injury is Complete.
Otherwise, injury is Incomplete.

5. Determine ASIA Impairment Scale (AIS) Grade.

Is injury Complete? IF YES, AIS=A

NO ↓

Is injury Motor Complete? IF YES, AIS=B

NO ↓

(No-voluntary anal contraction OR motor function more than three levels below the motor level on a given side, if the patient has sensory incomplete classification)

Are at least half (half or more) of the key muscles below the neurological level of injury graded 3 or better?

NO ↓

YES ↓

AIS=C AIS=D

If sensation and motor function is normal in all segments, AIS=E
Note: AIS E is used in follow-up testing when an individual with a documented SCI has recovered normal function. If at initial testing no deficits are found, the individual is neurologically intact and the ASIA Impairment Scale does not apply.

6. Determine the zone of partial preservation (ZPP).

The ZPP is used only in injuries with absent motor (no VAC) OR sensory function (no DAP, no LT and no PP sensation) in the lowest sacral segments S4-5, and refers to those dermatomes and myotomes caudal to the sensory and motor levels that remain partially innervated. With sacral sparing of sensory function, the sensory ZPP is not applicable and therefore "NA" is recorded in the block of the worksheet. Accordingly, if VAC is present, the motor ZPP is not applicable and is noted as "NA".

Appendix 7: Follow-up Psychological Proforma

Mood:

Over the <u>last 2 weeks</u> , how often have you been bothered by the following problems? (Use “✓” to indicate your answer)	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Little interest or pleasure in doing things	0	1	2	3
4. Feeling down, depressed, or hopeless	0	1	2	3

Interpretation:

Sum questions

1 and 2 - a score of 4 or greater is considered a positive screen, refer to patient's local community services or SCIC Psychological service if patient is admitted to the SCIC

3 and 4 - a score of 4 or greater is considered a positive screen, refer to patient's local community services or SCIC Psychological service if patient is admitted to the SCIC

Substance / Alcohol Use

How often have you had 6 or more drinks containing alcohol on one occasion in the past year:

Less than monthly / monthly / weekly / daily or almost daily

How often in the past year have you used an illegal drug or a prescribed medication for a non-medical reason:

Less than monthly / monthly / weekly / daily or almost daily

A positive psychometric screen is weekly for alcohol use of 6 drinks or more and monthly for drug misuse – refer to patient's local community services or SCIC Psychological service if patient is to be admitted to the SCIC