SESLHD PROCEDURE COVER SHEET

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EXECUTIVE SPONSOR or EXECUTIVE CLINICAL SPONSOR	SESLHD Director Emergency Clinical Stream
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POSITION RESPONSIBLE FOR THE DOCUMENT	Liz Walter District Trauma Coordinator, SESLHD Elizabeth.walter@health.nsw.gov.au
KEY TERMS	Acute Spinal Cord Injury, Spinal Cord Injury Service
SUMMARY	Procedure for the transfer of **Adults** with acute spinal cord injury to the Major Trauma Service and/or to the Spinal Cord Injury Service (SCIS) for South Eastern Sydney Local Health District (SESLHD) and its referral network.

Feedback about this document can be sent to seslhd-executiveservices@health.nsw.gov.au

Acute Spinal Cord Injury of the Adult – Management and Referral Procedure

SESLHDPR/291

1. POLICY STATEMENT

Early referral and transfer of patients with spinal cord injury (SCI) to a specialised Spinal Cord Injury Service (SCIS) improves outcomes and reduces major complications. This is in line with the NSW Policy Directive PD2018 011 Critical Care Tertiary Referral Networks and Transfer of Care (ADULTS) and Selected Specialty and Statewide Service Plans, NSW Trauma Services Number Six, December 2009. The purpose of this procedure is to ensure patients with SCI are able to access speciality SCIS when needed. Admission should be timely and equitable. Timely admission means as soon as is practically possible, with an ideal being a direct admission less than 24 hours following injury.

2. BACKGROUND

The NSW State Spinal Cord Injury Service for **adults (age 16 years or greater)** is co-located at Prince of Wales Hospital (POWH) and Royal North Shore Hospital (RNSH). This is a tertiary level service that delivers multidisciplinary care in an appropriate physical environment as required by the NSW Health Model of Care for SCI. This combination of expertise is not available at or transferable to other sites and so transport of patients to one of the SCIS hospitals is required.

Acute spinal cord injury

The rapid deterioration in neurological function due to injury of the spinal cord or cauda equina (covering neurological segments C1 to S5) from non-progressive disease, including trauma, intervertebral disc herniation, transverse myelitis, bacterial infection, ischaemia or haematoma. Progressive neurological disorders and metastatic neoplastic disease are specifically excluded. Unilateral injury to single nerve roots (sciatica or brachialgia) is not included in the definition of spinal cord injury.

The SCIS at POWH

The POWH SCIS is the default service to provide immediate and continuing care for acute spinal cord injured patients from within SESLHD and its referral network within Southern NSW. Referring Local Health Districts are the following:

- South Eastern Sydney
- Illawarra Shoalhaven
- Murrumbidgee
- Southern NSW
- South Western Sydney
- Sydney
- Australian Capital Territory (ACT)
- St Vincent's Health Network

Non-refusal policy at POWH

The SCIS at POWH is bound to accept any appropriate referral of acute spinal cord injury that is notified within 24 hours of the injury occurring. Referrals to POWH later than 24 hours after the onset of SCI will be accommodated at the earliest possible opportunity based on availability of appropriate resources within the hospital.

It is not expected that POWH will be mandated to accept all referrals of SCI, in some circumstances transfer of the patient may not be appropriate. In cases where a bed is not available at POWH SCIS, the spinal surgeon on call will liaise with RNSH for admission of the patient. Spinal cord injury, Non-refusal policy for

Appropriate Referral Type

The SCIS at POWH will accept patients with the following clinical characteristics:

- Age 16 years or older
- Sudden onset of neurological deficit affecting spinal segments from C1 to S5 (but not unilateral, single nerve root compromise)
- Presentation following trauma or presumed non-progressive pathology
- Has a reasonable expectation of surviving the acute injury and/or medical co-morbidities
- Spinal cord and spinal column imaging are not required prior to referral or transfer.

Patients with the following characteristics will not be accepted

- Age younger than 16 years (refer to Sydney Children's Hospital Network at Randwick or Westmead)
- Moribund patients or patients with such severe injury as to put their immediate survival in jeopardy
- Patients with documented or presumed progressive pathology affecting the spinal cord or cauda equina (demyelinating and degenerative conditions of the spinal cord, metastatic tumours or congenital disorders).

Network SCIS and Major Trauma Service SESLHD

The SCIS at POWH is networked with the Major Trauma Service at St George Hospital in SESLHD. The SCIS at POWH will be the primary referral centre for SCI patients referred to the Trauma Service at St George Hospital and will provide a non-refusal service to such patients. Referral of multisystem injured patients with SCI to St George Hospital is appropriate for triage directly to the most appropriate service (the Trauma Service or SCIS).

St George Trauma Hotline Use and Referral Procedure

NSW Aeromedical and Medical Retrieval Service (AMRS)

The need for physician-assisted transfer is determined by AMRS in consultation with the receiving SCIS and ICU. Transfer will generally require medically supervised transport which may be via AMRS. AMRS should be contacted on **1800 650 004** by the referring hospital to facilitate the medical retrieval of adults with an acute spinal cord injury.

3. RESPONSIBILITIES

3.1 Referring clinicians will:

- Refer cases of acute spinal cord injury at the time of diagnosis without delay
- Seek advice from the SCIS at POWH if uncertain of the appropriateness of referral

- Ensure adequate spinal precautions are implemented
- Ensure adequate breathing and airway in cases of cervical spinal cord injury
- Complete the Spinal Cord Injury Referral and Transfer form to accompany the patient
- Ensure that any imaging studies performed are sent with the patient
- Contact AMRS to arrange patient transfer.

3.2 On-duty Senior Trauma Officer at St George Hospital Trauma Service will:

- Assess referred cases for physiological stability
- May refer cases of multisystem trauma with SCI that require major intervention for non-spinal injuries to RNSH (evidence of motor and /or sensory deficit is required, paraesthesia alone is not sufficient evidence of spinal cord injury)
- May accept cases of multisystem trauma with life-threatening injuries for immediate trauma care at St George Hospital trauma service
- Refer patients with isolated SCI or SCI with associated minor injuries or who have been stabilised following multi-system injury to POWH SCIS.

3.3 On-duty Spinal Surgeon at POWH Spinal Cord Injury Service will:

- Assess referred cases for suitability for transfer to the SCIS
- Discuss referral with the consultant on-duty in POWH ICU and the on-call POWH spinal rehabilitation specialist
- Use the POWH SCIS 'Non-Refusal' policy to accept urgent appropriate referrals
- Otherwise determine an appropriate time of patient transfer
- Establish suitable plan of management if delays in transfer are expected
- Liaise with the SCIS at Royal North Shore Hospital in the event that POWH does not have sufficient resources to accept the patient at the time of referral.

3.4 Receiving Spinal Surgical Team at POWH will:

- Notify POWH Emergency Department (ED) of the expected arrival of the patient
- Arrange for a 'trauma call' on all cases of post-traumatic SCI
- Arrange for an appropriate in-patient bed for the patient
- Review the patient in the ED within 30 minutes of arrival at POWH
- Notify the Spinal Rehabilitation team of the arrival of the patient.

3.5 Receiving Spinal Rehabilitation Team at POWH will:

- Review the patient within 12 hours of arrival at POWH.

4. PROCEDURE

See flow chart in Appendix 1.

5. DOCUMENTATION

Acute Spinal Cord Injury Referral and Transfer Form and Neurological Assessment Form (see Appendix 2).

6. MANAGEMENT

- Remove from spinal board
- Replace rigid collar with semi-rigid collar (Miami-J or Philadelphia type)
- Keep nil by mouth
- Insert urinary catheter
- Maintain mean arterial blood pressure above 80mmHg if possible
- Controlled turn every two hours for pressure care
- Monitor ventilation if there is cervical level of spinal cord injury:
    - Look for respiratory distress
    - Check oxygen saturation and/or serial arterial blood gasses
    - Measure vital capacity
    - Consider intubation and ventilation if oxygen saturation falls, CO_2 levels rise or vital capacity is falling.

7. AUDIT

Annual analysis of the Spinal Cord Injury Database held jointly between POWH and Royal North Shore Hospital. This database will capture all cases of spinal cord injury in NSW and allows analysis of referral times.

8. REFERENCES

1. NSW Ministry of Health 'Selected Specialty and Statewide Service Plans: NSW Trauma Services' (Number 6) December 2009.

2. NSW Ministry of Health PD2018_011 Critical Care Tertiary Referral Networks and Transfer of Care (ADULTS)

3. Prince of Wales Hospital Non-Refusal Policy for Acute Spinal Cord Injury at POWH. March 2013.

4. NSQHS Standards - Standard 8: Preventing and Managing Pressure Injuries.

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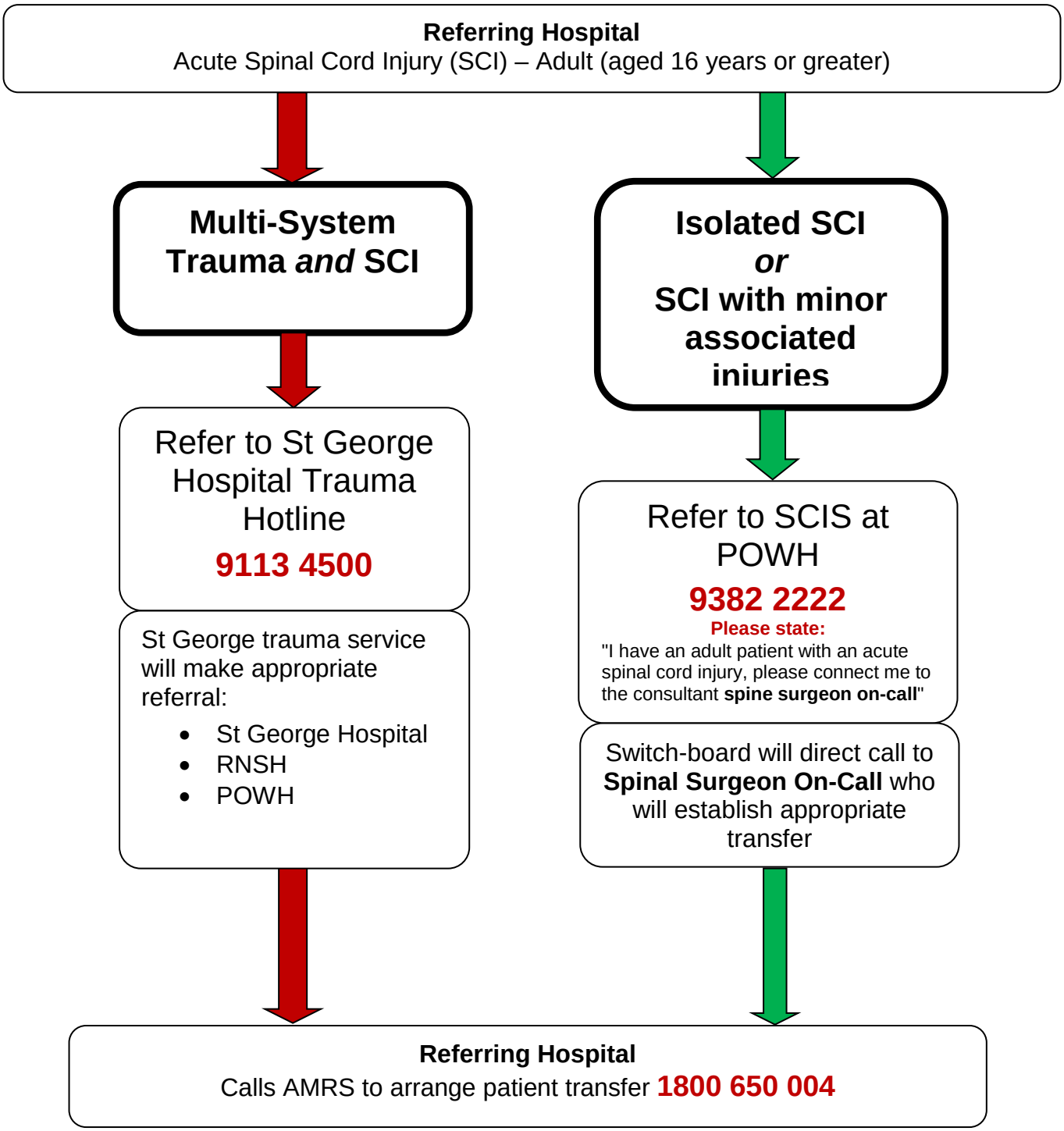
6. Middleton PM; Davies SR; Anand S; Reinten-Reynolds T; Marial O; Middleton JW. (2012) The pre-hospital epidemiology and management of spinal cord injuries in New South Wales: 2004–2008. *Injury, Int. J. Care Injured* (43) 480–485.

7. Monish Maharaj, Ralph Mobbs, Ralph Stanford, Bonne Lee, Barbara Toson, Obayd Marial (Unpublished data) (2013). Impact on length of stay and complications following traumatic spinal cord injury of non-refusal policy to a specialised spinal cord injury centre: retrospective analysis of spinal cord injury database at Prince of Wales Hospital.

9. REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
May 2013	1	Revised by Leanne Horvat, Clinical Stream Nurse Manager, Medicine, Critical Care and Emergency
Sept 2013	2	Converted to procedure and re-formatted by Scarlette Acevedo, District Policy Officer
Sept 2013	2	Revised by Dr Ralph Stanford, Staff Specialist/Orthopaedic Surgeon, Prince of Wales Hospital and Leanne Horvat, Clinical Stream Nurse Manager, Medicine, Critical Care & Emergency
Nov 2013	3	Clinical & Quality Council provided requested further amendments to be made. Further amendments made by Leanne Horvat, Clinical Stream Nurse Manager, Medicine, Critical and Emergency Clinical Stream and Dr Ralph Stanford, Staff Specialist/Orthopaedic Surgeon POW.
Dec 2013	3	Finalised and re-formatted by Scarlette Acevedo, District Policy Officer.
Nov 2015	4	Revised by Liz Walter, District Trauma CNC, SESLHD
Dec 2015	4	Endorsed by: The Network Trauma Committee
January 2016	4	Endorsed by: Dr Tony Joseph, Director of Trauma, RNSH
February 2016	4	Endorsed by Executive Sponsor
June 2016	4	Approved by SESLHD CQC
November 2018	5	Review undertaken with no changes – approved by Executive Sponsor.
November 2018	5	Processed by Executive Services prior to publishing.

Appendix 1



Appendix 2

ACUTE SPINAL CORD INJURY REFERRAL AND TRANSFER FORM (v March 2016)

This form is to be completed prior to transfer of the person with a SCI to a spinal or trauma unit and given to the Retrieval or NSW Ambulance Service teams as part of the medical record and/or faxed to the receiving hospital.

Patient label

CONTACT DETAILS	**Patient name:**		**Age:**
	Referring Hospital:	**Referring Doctor:**	**Weight (kg):**
		Referring Doctor's contact number:	
		Referral date ____/_____/____ **Referral time** _____:____**AM/PM**	
	Hospital accepting referral:	**Doctor accepting referral:**	**Destination ward:**
		Accepting Doctor's contact number:	
SPINAL CORD INJURY	**Date of injury** _____/_____/_____	**Time of injury** _____:_____**AM/PM**	For guidance on sensory and motor level refer to attached neurological chart.
	Mechanism of Injury:		
	Approximate sensory level:	**Approximate motor level:**	
	Is peri-anal sensation present: YES ☐ **NO** ☐	**Is anal contraction present? YES** ☐ **NO** ☐	
	Results of Spinal X-Rays, CT or MRI Scan		
SPINAL PRECAUTIONS & STABILISATION	**Cervical collar** ☐ **YES** ☐ **NO** **Type of collar** _____	**Surgery** ☐ **YES** ☐ **NO** **Date of surgery** _____/_____/_____ **Type of surgery** _____	

Appendix 2

	Time of application of collar ___:____AM/PM		
AIRWAY *	☐ ETT in situ ☐ Correct ETT position	☐ ETT secure ☐ NGT/OGT if intubated or vomiting	☐ Mechanical vent.
BREATHING *	Resp rate_____SpO2_____ Vital Capacity _____(10-15mls/kg)	FiO2 _____lt/min ABGs - PaO2_____PaCO2_____pH_____	Chest tubes ☐ YES ☐ NO
CIRCULATION *	Pulse _____/min Blood Pressure ____/____ mmHG	Urine Output >0-5mls/kg/hr ☐ YES ☐ NO Arrhythmias	☐ IDC ☐ SPC Core Temp_____^{0}C
	☐ Peripheral IVs – number _____ ☐ Other IV / arterial access	Fluid resuscitation _____ Total fluids in_____ Litres.	
LEVEL OF CONSCIOUSNESS *	Level of consciousness at scene: GCS _____ Seizures: ☐ NO ☐ YES _____:_____AM/PM Current level of consciousness: GCS _____ _____:_____AM/PM		
ASSOCIATED INJURIES			
MEDICAL CONDITIONS			
SKIN PROTECTION	Has the patient been log rolled and skin checked 2nd hourly? ☐ YES ☐ NO Time of last log roll _____hours Time skin under cervical collar checked _____hours		
DOCUMENTATION FOR TRANSFER	☐ AMRS / NETS Transfer form * Relevant records: ☐ medical & ☐ nursing	☐ X-rays/CT/MRI scans - spinal column ☐ X-rays/CT/MRI scans-head/chest/abdo/pelvis/limbs	
NEXT OF KIN (NOK)	Notified ☐ YES ☐ NO NOK Name…… Ph ……		

Patient Name _____

Examiner Name _____ Date/Time of Exam_____

ASIA
AMERICAN SPINAL INJURY ASSOCIATION

INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY

ISCOS

MOTOR

KEY MUSCLES (scoring on reverse side)

	R	L	
C5	☐	☐	Elbow flexors
C6	☐	☐	Wrist extensors
C7	☐	☐	Elbow extensors
C8	☐	☐	Finger flexors (distal phalanx of middle finger,
T1	☐	☐	Finger abductors (little finger)

Comments:

L2	☐	☐	Hip flexors
L3	☐	☐	Knee extensors
L4	☐	☐	Ankle dorsiflexors
L5	☐	☐	Long toe extensors
S1	☐	☐	Ankle plantar flexors

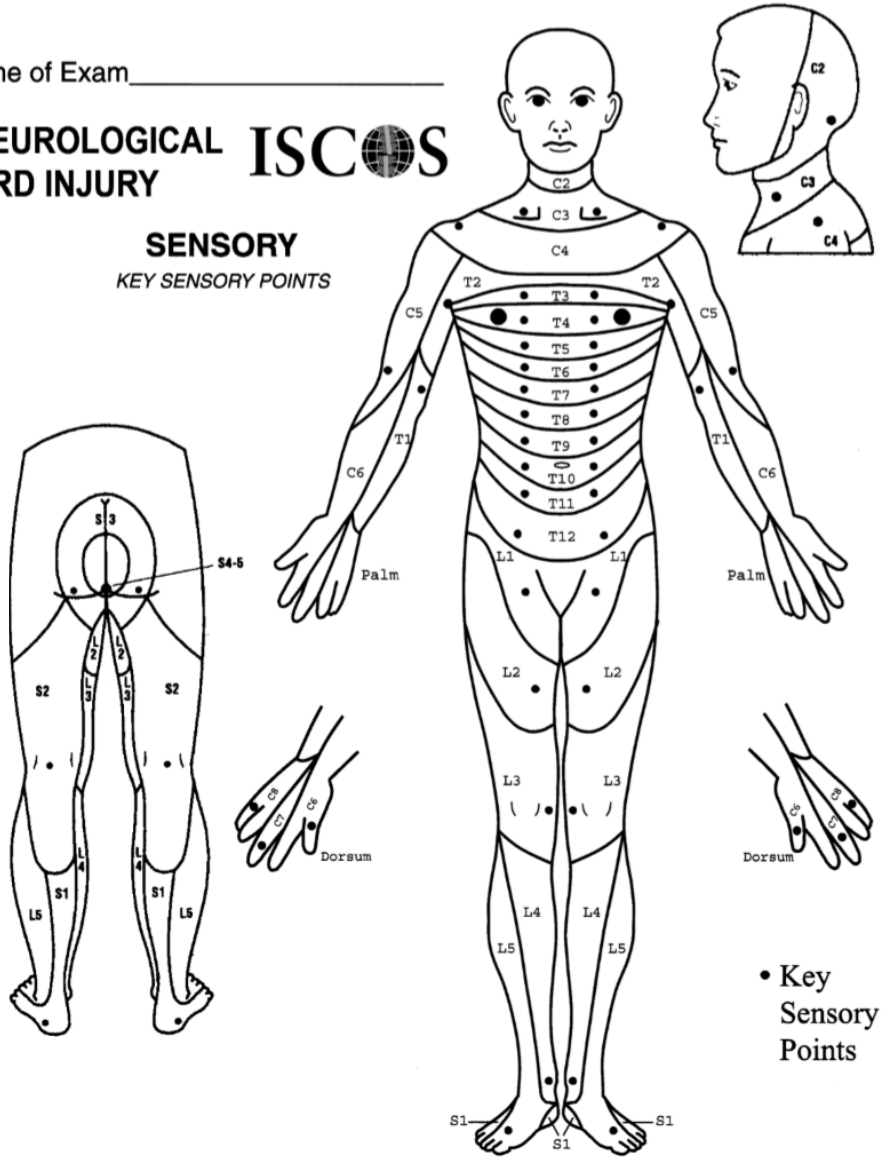
(VAC) Voluntary anal contraction (Yes/No) ☐

LIGHT TOUCH

	R	L
C2		
C3		
C4		
C5		
C6		
C7		
C8		
T1		
T2		
T3		
T4		
T5		
T6		
T7		
T8		
T9		
T10		
T11		
T12		
L1		
L2		
L3		
L4		
L5		
S1		
S2		
S3		
S4-5		

SENSORY

KEY SENSORY POINTS



• Key Sensory Points