LOG ROLLING PATIENTS IN CICU WITH SUSPECTED/CONFIRMED SPINAL CORD INJURY - SCH

PROCEDURE ©

DOCUMENT SUMMARY/KEY POINTS

- Maintenance of correct anatomical alignment is an important element in supporting the acutely injured spine. Procedure promotes safe and consistent techniques to prevent exacerbation of any existing spinal injury during the essential movement of these patients.
- The objective is to maintain correct anatomical alignment in patients with suspected or confirmed spinal cord injury (SCI) to prevent the possibility of further neurologic injury and the prevention of pressure injuries.
- Spinal precautions should always be taken where the mechanism of injury is such that the spinal column and cord are at risk of injury or an injury has been confirmed.
- Rigid cervical collars are no longer recommended for purpose of minimising unnecessary movement of the C-Spine in infants and children with suspected C-Spine injury.
- Infants & children arriving to CICU with a rigid C-collar insitu may either be clinically cleared and collar removed or changed to a foam cervical collar if prolonged time to clearance is anticipated.
- Patients with a confirmed C-spine injury may still be appropriate for foam collar application. However, alternate semi-rigid collars are also available & may be requested by the Senior Clinician.
- SCHN Cervical Spine (Suspected) Injury: Patient Management Clinical Practice Guideline contains further detailed information including instructions for application & care of two piece semi-rigid collars.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1st September 2019	**Review Period:** 3 years
Team Leader:	Clinical Nurse Consultant	**Area/Dept:** CICU

- **Children at risk of C-Spine injury who are unconscious, unco-operative, intoxicated, GCS < 14 or have received significant opiate analgesia are unsafe to assess for spinal injury and thus un-assessable for c-spine clearance**
- Rigid c-collars are sized & fitted by Orthotics and needs to be ordered through eMR. **Orthotics are on call if this is required out of hours**. Orthotics are also available to troubleshoot concerns, such as patient discomfort and/or pressure area associated with the collar, and inadequate alignment.
- All nursing and medical staff involved in that patient's care are responsible for maintaining spinal precautions.
- Patients with suspected or confirmed spinal injuries must not be turned until the ICU Registrar/Fellow/Consultant documents instructions in the patient's medical records and a cervical collar must be fitted before log rolls commence.
- **Team member 1**: *Head control and team leader*. This role must only be undertaken by a CNS, Team Leader or ACCESS RN who has successfully achieved requirements described in "Extended skill acquisition" – *Appendix 1*. Alternatively, it may be undertaken by a medical officer who has received appropriate teaching.
- The patency and security of the ETT is also of utmost importance and one team member must be solely responsible for holding the ETT in intubated patients
- **Discontinuation of log rolling and/or removal of cervical collar is the responsibility of the Neurosurgical Consultant / Fellow following radiological and clinical clearance and MUST BE DOCUMENTED IN THE PATIENT'S EMR**
- If the patient has been fitted with a Stifneck® extrication collar or rigid two-piece collar *ie Philadelphia®, Miami J® or Aspen®,* the collar must be removed 2nd hourly for hygiene purposes and to assess for pressure ulceration

CHANGE SUMMARY

- Document due for mandatory review.
- Rigid cervical collars are no longer recommended for purpose of minimising unnecessary movement of the C-Spine in infants and children with suspected C-Spine injury.
- Infants & children arriving with a rigid collar insitu may either be clinically cleared and collar removed or changed to a foam cervical collar if prolonged time to clearance is anticipated.
- Patients with a confirmed C-spine injury may still be appropriate for foam collar application. However, alternate semi-rigid collars are also available & may be requested by the Senior Clinician.
- Identifying hyperlink to be used to take staff to SCHN C-Spine CPG for further information including instructions for application & care of two piece semi-rigid collars

- **Children at risk of cervical spine injury who are unconscious, unco-operative, intoxicated, GCS < 14 or have received significant opiate analgesia are unsafe to assess for spinal injury and thus un-assessable for c-spine clearance**
- Alteration of clinical clearance criteria from NEXUS to Paediatric Emergency Care Applied Research Network (PECARN)

READ ACKNOWLEDGEMENT

- Training/Assessment Required: Team member 1:head control and team leader, role must only be undertaken by a:
  - CNS/ TL or ACCESS RN who has successfully achieved requirements described in "Extended skill acquisition" – *Appendix 1*
  - Medical officer who has received appropriate teaching
- All CICU nursing and medical staff are required to read and acknowledge they understand the contents of this document.

TABLE OF CONTENTS

1 Purpose and Scope

Major trauma patients are considered to have a SCI until proven otherwise and need to be immobilised as a precaution against further neurological deficit. Spinal precautions should always be taken where the mechanism of injury is such that the spinal column and cord are at risk of injury or an injury has been confirmed. Maintenance of correct anatomical alignment is an important element in supporting the acutely injured spine. This protocol is to ensure safe and consistent techniques are employed to prevent exacerbation of any existing spinal injury during the essential movement of these patients. Objective of the log roll procedure is to maintain correct anatomical alignment in patients with suspected or confirmed SCI's in order to prevent the possibility of further neurologic injury and the prevention of pressure injuries.

ALERT: Children at risk of cervical spine injury who are unconscious, unco-operative, intoxicated, GCS < 14 or have received significant opiate analgesia are unsafe to assess for spinal injury and thus un-assessable.

2 Responsibilities

Spinal precautions should always be taken where mechanism of injury is such that spinal column and cord are at risk of injury or an injury has been confirmed and documented.

- All nursing and medical staff involved in patient care are responsible for maintaining spinal precautions.
- Patients with suspected or confirmed spinal injuries must not be turned until the CICU Registrar/Fellow/Consultant documents instructions in the patient's eMR *(ideally in consultation with the neurosurgical team)* that this is suitable and a cervical collar must be fitted before log rolls commence.
- **Discontinuation of log rolling and/or removal of cervical collar is the responsibility of the Neurosurgical Consultant / Fellow following radiological and clinical clearance and MUST BE DOCUMENTED IN THE PATIENT'S EMR**
- **ALERT:** ***Patency and security of the ETT is of utmost importance and one team member must be solely responsible for holding the ETT in intubated patients.***

3 Definition of Terms

Log rolling - method of turning a patient without twisting the spine; used when person's spinal column is unstable or suspected to be so

Spinal Cord Injury - disturbance of spinal cord that results in loss of sensation and mobility. SCI occurs as the direct result of trauma to the vertebral column and may result in:

- Skeletal fractures
- Subluxation or dislocation injuries
- Locked facet joints
- Inter-verterbral disk injuries

- Spinal ligamentous injuries

Spinal clearance: occurred when suspected bony, ligamentous or cord injuries in the patient have been excluded by radiological and physical examination.

Radiological clearance: use of X -Rays to assess the spine for injuries. Lateral, Anterior-Posterior and Odontoid if >5 years of age and CT should be used. If imaging is considered to be abnormal then a MRI should be performed. The possibility of spinal cord injury without radiological abnormality (SCIWORA) should be considered in the presence of normal imaging but abnormal neurology.

Clinical clearance: According to the Paediatric Emergency Care Applied Research Network (PECARN), any child demonstrating any of these 8 risk factors should be considered for cervical spine immobilisation *(using a foam collar*) and radiographic evaluation:

- High risk MVA?
- Altered mental status?
- Focal neurological deficit?
- Significant neck pain?
- Torticollis?
- Diving or other axial load?
- Substantial torso injury?
- Conditions predisposing to CSI (Down's, ankylosing spondylitis etc.)

4 Work Health & Safety Issues

Ideally all personnel involved are of similar height, otherwise this order should be of decreasing height, with the shortest person taking the patient's legs. The bed should be set at the average height of the staff involved in the roll, keeping in mind that the person controlling the head can be in the most compromising position. All staff involved in log rolling should wear appropriate PPE (aprons and gloves) and eye protection should be considered on an individual patient basis.

5 Application

Log rolling should be practiced when turning all patients with suspected or confirmed spinal injury, including: -

- 2nd hourly pressure area care.
- Clinical C-spine clearance.
- Toileting, washing and/or sheet changes.
- Preventing aspiration during vomiting.
- To check for further injuries during secondary surveys.

- During physiotherapy treatment.

Patients with a SCI are at particular risk of developing pressure ulcers as a result of:

- loss or decrease in movement.
- loss or decrease in sensation.
- use of cervical traction, splints, cervical collars.
- the use of cooling blankets.
- the use of muscle relaxants.

Rigid c-collars are sized & fitted by Orthotics and needs to be ordered through eMR. **Orthotics are on call if this is required out of hours**. Orthotics are also available to troubleshoot concerns, such as patient discomfort and/or pressure area associated with the collar, and inadequate alignment

If the patient has been fitted with a StifNeck® extrication collar or rigid two-piece collar *ie Philadelphia®, Miami J® or Aspen®,* the collar **must be removed 2nd hourly** for hygiene purposes and to assess for pressure ulceration. If a foam collar is insitu, the collar **must be removed 4th hourly** for hygiene purposes and to assess for pressure ulceration. When the front of the collar is removed, the patient must be supine and flat with the head held by either a CNS / TL / ACCESS RN accredited in head control during log rolling or a medical officer. The collar must be replaced prior to log rolling. Once the patient is in an anatomically aligned lateral position and when the head holder is ready, the back of the collar may be removed to assess the occipital region. If there are any signs of pressure areas, an IIMs must be completed, a medical officer and the wound care CNC notified and it must be documented in the patient's medical records and on the Wound Assessment Chart.

6 Method

- The procedure should be explained to the patient in an developmentally appropriate manner, regardless of conscious state.
- The person who will be controlling the patient's head during the log rolls must liaise with the bedside nurse about timing of log rolls, the administration and timing of sedation and whether ETT suctioning is required prior to log rolls occurring. A plan of care should be formulated between these two staff members.
- If sedation is required prior to log rolling, Morphine 50 – 100microg/kg/dose and Midazolam 50 – 100 microg/kg/dose is recommended. These doses should be ordered on the patient's medication chart.
- Four clinicians are required to log roll a child weighing greater than 15 kg. One extra person is required to attend hygiene requirements/inspect skin integrity etc.
- Three clinicians are required to log roll a child weighing less than 15 kg. One extra person is required to attend hygiene requirements/inspect skin integrity etc.
- **ALL intubated patients require one extra person to be solely responsible for the security of the ETT. This person's role is dedicated to ensuring the ETT remains patent and secure during the log roll.**

- Other staff members may be required if other external devices are attached (such as IV lines, monitoring, drains, POP casts, external fixation devices or ventilator tubing), as well as patients who may be agitated due to the mechanism of their injury.

Team member 1: head control and team leader

- The person responsible for the patient's head and neck and takes control of the log roll by leading the team. This role must only be undertaken by a CNS/ TL / ACCESS RN who has been accredited using the "Extended skill for CNS/ TL / ACCESS RN' in CICU – head holds for log rolling patients with confirmed/suspected spinal injuries" checklist, or a medical officer who has received appropriate teaching. The team leader takes the position at the head of the bed, and instructs the other team members to take up their positions on one side of the patient.
- The person responsible for head holding must:

Prior to the log roll:

- Ensure sedation has been given and suction performed as per the plan of care that had been formulated between the bedside nurse and the team leader of the log roll.
- ensure all lines and tubing have sufficient slack.
- ensure sand bags and any other items that may be on the bed are repositioned to prevent any obstruction to the safe movement of the patient.
- ensure the ETT is secure and will not be compromised during the roll by ensuring one staff member is allocated to hold the ETT.
- ensure that the collar is well fitting.
- ensure the patient's arms are positioned correctly (see figure 2). For patients with upper limb dysfunction, particular care must be taken in positioning the arms to prevent shoulder damage.
- ensure that the team is correctly placed and is ready to turn in synchrony (e.g. 'Is everyone ready? We will turn on the count of 3. 1,2,3').
- correctly and safely support the head and neck by placing the hands face up under the patient's shoulders between the scapulae with forearms cradling the patient's head. (see figure 1).

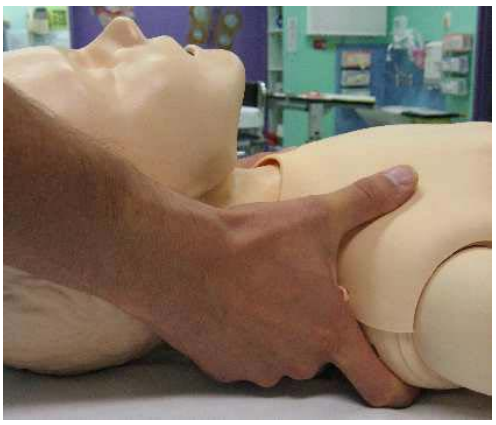


Figure 1: *Team Leader's hand placement (the cervical collar has been intentionally left off for illustrative purposes only)*

During the roll:

- manage cervical spine alignment and control of the roll.
- give clear instructions throughout the procedure.
- ensure the turn is carried out at an appropriate speed.
- Inform the team when to roll the patient back to the supine position by stating 'back on the count of three…1,2,3'.
- ensure the patient is left in correct anatomical alignment.

After the roll:

- Position the sandbags correctly once the patient is returned to the desired position.
- be the last person to remove their hands from the patient on the completion of the log roll.
- respond appropriately to any difficulties encountered.

Team member 2: Chest

The staff member responsible for moving the patient's chest should place their hands over the patient's shoulder and lower back.

Team member 3: Hip/pelvis

The team member responsible for the hip/pelvis area should place one hand near the lower hand of the "chest person" on the patient's lower back and the other under the patient's thigh.

Team member 4: Legs

The team member responsible for the legs should place both hands underneath the far leg. A pillow may be inserted between the patient's legs to maintain alignment.

When instructed to roll by the team leader, all team members should watch the movement of the head and chest constantly and roll the pelvis and legs at the same rate. See Figure 2

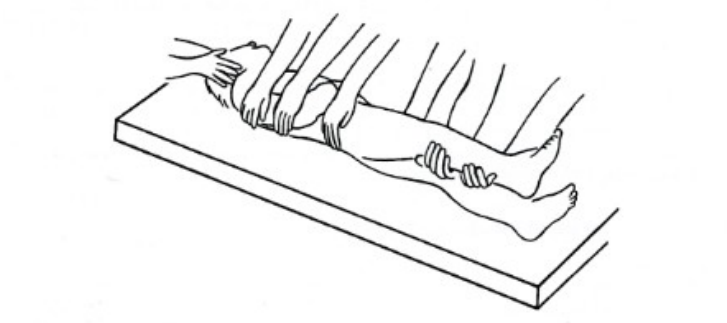


Figure 2 : correct hand placement for 4 person log roll

For children under 15 kg, a 3 person technique can maintain spinal alignment. The role of the person controlling the head is unchanged, one team member turns the arms and chest whilst the third team member turns the pelvis and legs. See Figure 3.

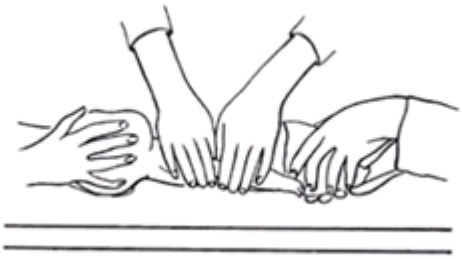


Figure 3 : correct hand placement for 3 person log roll

Note: *If unable to hold both the pelvis and legs in this way, seek additional assistance and perform 4-person technique.*

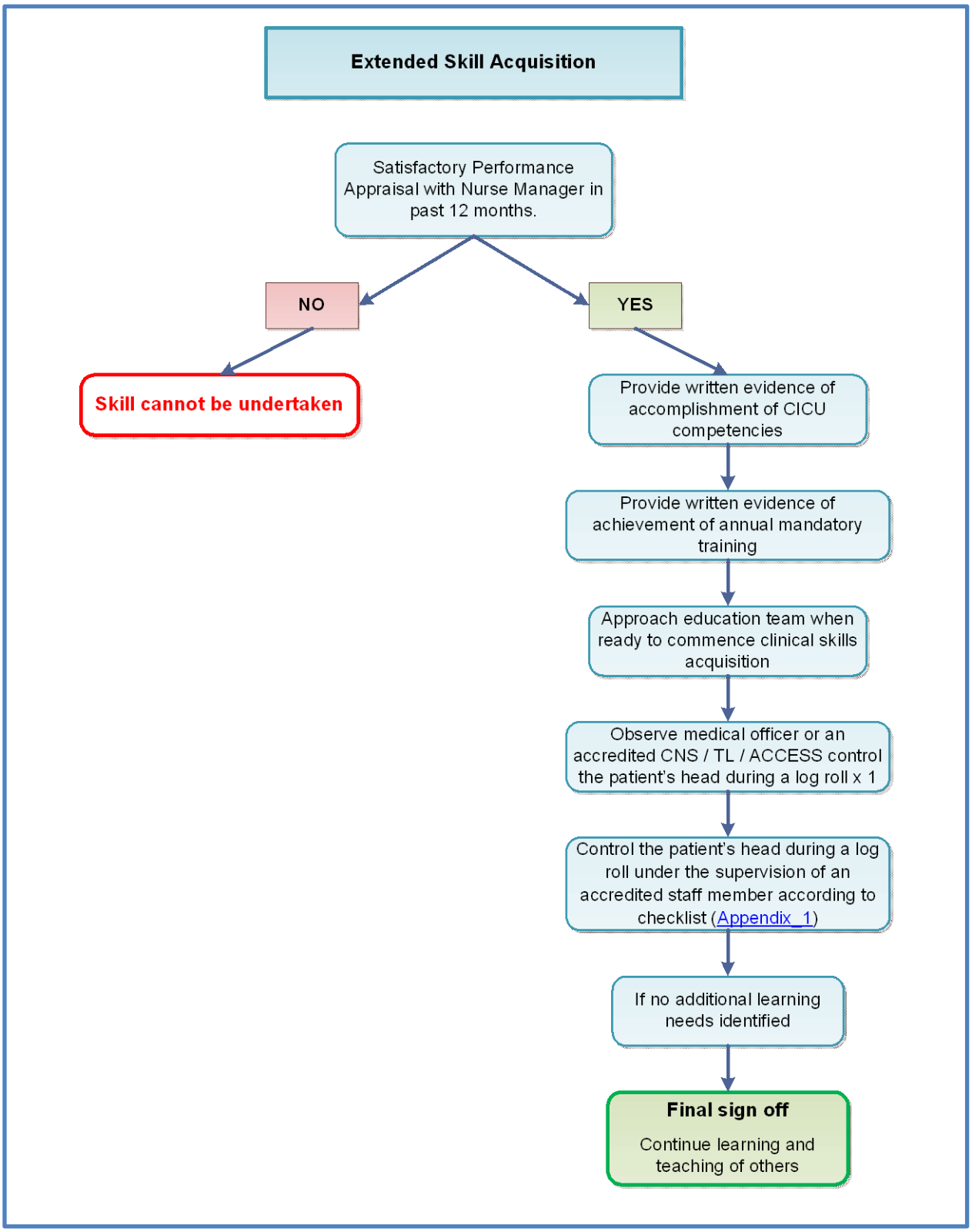
7 Outcomes

All patients with suspected or confirmed spinal injuries will be safely log rolled 2nd hourly with no adverse events such as spinal cord injury, ascension of injury or the development of pressure injuries.

8 Bibliography

1. Australian and New Zealand Committee on Resuscitation.(2016) ANZCOR Guideline 9.1.6 – Management of Suspected Spinal Injury: 1-6.
2. Correia Copley, P., Tilliridou, V., Kirby, A., Jones,J. and Kandasamy, J. (2018) Management of cervical spine trauma in children. European Journal of Trauma and Emergency Surgery 1-13
3. Johnson, G. (2018) A practical guide to suspected cervical spine injury. Paediatrics and Child Health 28:11 540-543
4. Leonard, J.R., Jaffe, D.M., Kuppermann, N., Olsen, C.S. and Leonard, J.C. for the Pediatric Emergency Care Applied Research Network (PECARN) Cervical Spine Study Group (2014) Cervical Spine Injury Patterns in Children. Pediatrics 133(5) e1179 –e1189
5. Babcock L., Olsen, C.S., Jaffe, D.M. and Leonard, J.C for the Pediatric Emergency Care Applied Research Network (PECARN). (2018) Cervical Spine Injuries in Children Associated With Sports and Recreational Activities. Pediatric Emergency Care 34(10):677-686.
6. NSW Institute of Trauma and Injury Management (ITIM) and the Emergency Care Institute (ECI) (2018) Use of foam collars for cervical spine immobilisation
7. Goergen S, Ditchfield M, Babl F, Oakley E, Rahman T, Johnson S. (2015) Paediatric Cervical Spine Trauma. Education Modules for Appropriate Imaging Referrals: Royal Australian and New Zealand College of Radiologists *(For information only)*

Appendix 1



Appendix 1: Checklist

Sydney Children's Hospital
Children's Intensive Care Unit

Extended skill for CNS's/Team Leaders/ ACCESS RN in CICU – head holds for log rolling patients with confirmed/suspected spinal injuries

Name : _____ Assessor:_____

Observable criteria	y	n	comments
Washes hands and applies PPE			
Introduces self to patient/family and explains procedure appropriately			
Ensures appropriate personnel are present for the turn • Minimum 4 staff log for >15 kg (+ 1 person for hygiene needs etc) • Minimum 3 staff for <15kg kg (+ 1 person for hygiene needs etc) • (plus extra staff prn for external devices such as ETT)			
Ensures staff are in correct position			
Ensures appropriate height of bed			
Ensures the collar is well fitting prior to log roll			
Acts as a pt advocate (ensures amount and timing of sedation adequate)			
Assumes control of the turn			
Ensures all lines and tubing have sufficient slack and that the ETT is secure			
Ensures sand bags and any other items that may be on the bed are repositioned to prevent any obstruction			
Positions patient's arms across their chest			
Checks that every team member is in correct position and is ready to turn			
States "we will turn on the count of three…1,2,3"			
Supports neck correctly throughout the turn			
Spinal alignment is maintained throughout the turn			
Turn is carried out at an appropriate speed			
Observes patient for any difficulties during and immediately following the turn			
Responds appropriately to any difficulties encountered			
Returns patient to correct position in bed following "we will turn on the count of three…1,2,3"			
Returns sand bags to appropriate position			
Is the last person to remove their hands from the patient			
Maintains patient's privacy throughout turn			
Terminates encounter appropriately			
Washes hands and removes PPE appropriately			
Reports/documents any difficulties			
Is able to answer the questions below correctly • When can a patient start to be log rolled? • What should you do if a patient complains of loss of sensation/movement during or after a log roll? • When should log rolling be ceased?			