Spinal Cord Injury
Clinical Pathway Synopsis

Spinal Cord Injury: Emergency Department

Exclusion criteria:
- SCI secondary to underlying congenital condition
- SCI secondary to acquired medical or surgical condition

QR code for mobile view

Patient presenting to ED with suspected spinal cord injury (SCI) following traumatic event (e.g., motor vehicle accident, sports or recreational injury, fall).

Initiate Advanced Trauma Life Support (ATLS) per Trauma Surgery and ED

Early Priorities:
- ***Avoid*** hypotension
- ***Avoid*** hypoxia
- ***Provide*** adequate analgesia
- ***Restrict*** spinal movement
  (refer to Spinal Stabilization Guidance)

Complications to Consider During Primary Survey
- ***C1 - C4 injuries:*** highly likely to require mechanical ventilation
  - *If intubating, consider utilizing atropine to minimize bradycardia*
- ***Low cervical and high thoracic injuries:*** may require airway or respiratory support
- ***Neurogenic shock or bradycardia:*** may require fluid resuscitation or vasopressors
- ***Polytrauma:*** may develop hemorrhagic shock

Primary Survey
Complete organized evaluation to identify life threatening injuries and intervene as necessary

Secondary Survey
- ***Complete*** organized evaluation to identify all injuries
- ***Order*** CT scan
- ***Consult*** Spine Surgery if not already involved
  (Neurosurgery for concomitant head injury)
- ***Place*** admission order to PICU

Complete initial disposition
- ***If spinal cord impingement is identified***
  - Decompression is indicated within 24 hours
- ***Determine*** need for MRI - spine surgeon and trauma physician
  - If MRI needed, spine surgeon and trauma physician to discuss timing of MRI with neuroradiology and anesthesia service

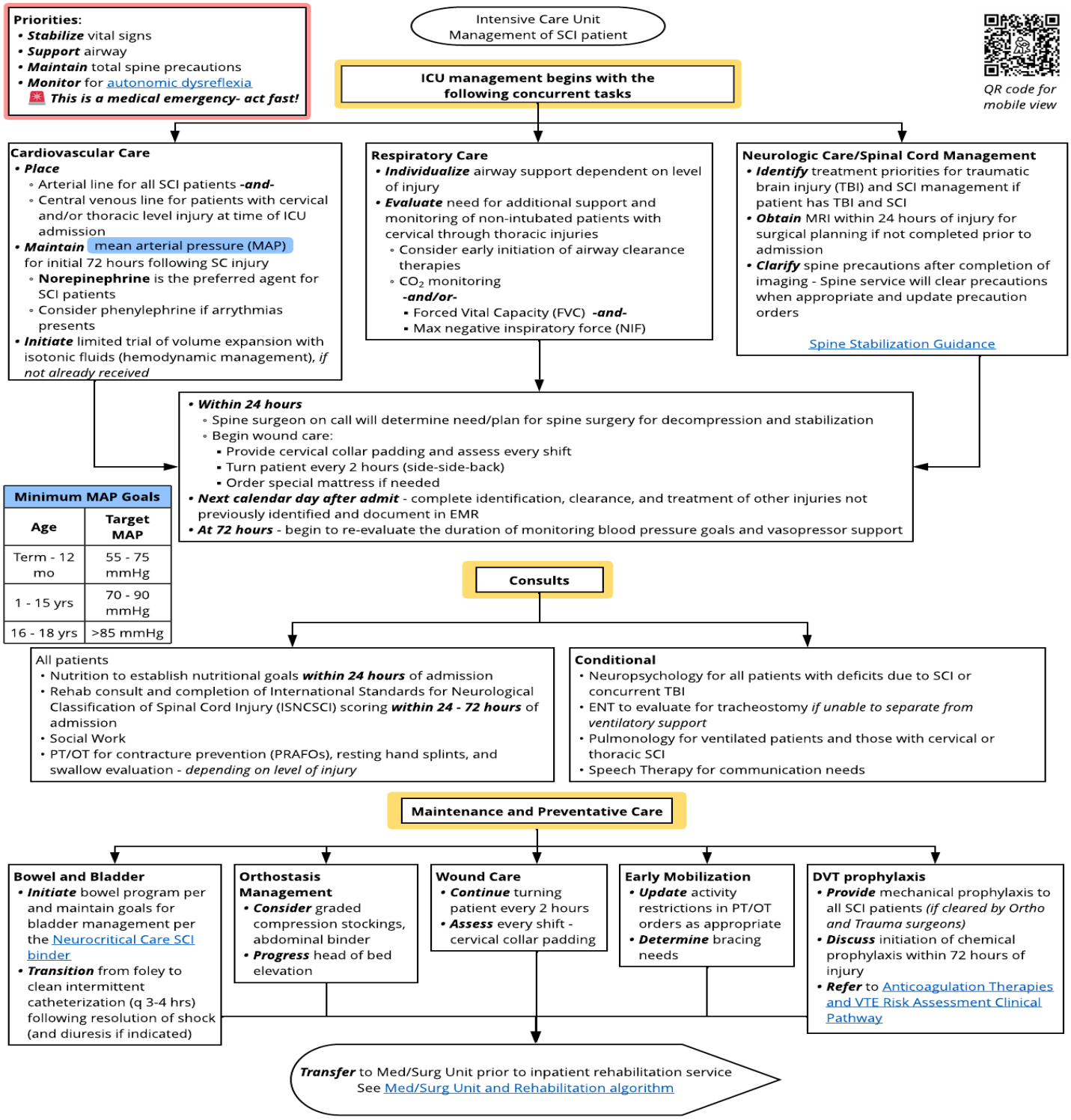
-MRI completion is not required for admission-

Neuroprotection and Early Monitoring Treatment
- ***Initiate*** early neuroprotection and treatment for neurogenic shock
  - Maintain mean arterial pressure (MAP) to support spinal cord perfusion
  - Provide fluid resuscitation with crystalloid or blood products
  - Utilize inotropic support for refractory hypotension:
    - First line = norepinephrine for isolated SCI
    - Consider epinephrine or alternate agents for poly trauma or mixed shock physiology
- ***Complete*** abbreviated SCI exam
  - Performed by Spine Service (NP, resident, fellow, or attending)
  - Document within 30 minutes of consultation
- ***Place*** Foley catheter to manage bladder dysfunction and evaluate resuscitation
  - Measure a post-void residual after foley placement
- ***Make*** NPO
- ***Consider*** placement for NG tube - SCI patients at risk for ileus

Minimum MAP Goals	
Age	**Target MAP**
Term - 12 mo	55 - 75 mmHg
1 - 15 years	70 - 90 mmHg
16 - 18 years	>85 mmHg

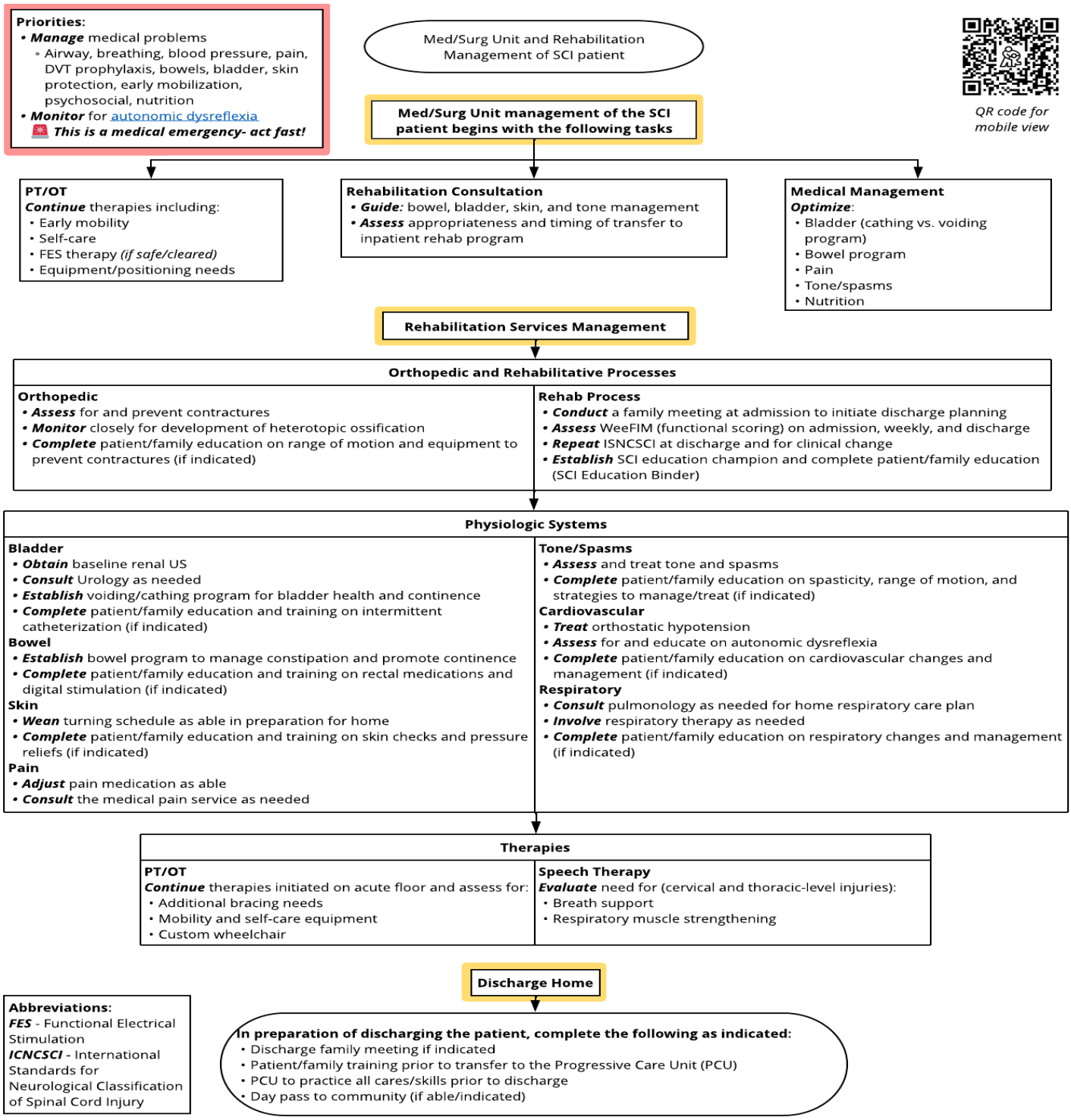
Finalize disposition and prepare for transfer to ICU
See ICU algorithm

Spinal Cord Injury: ICN



These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

Spinal Cord Injury: Rehabilitation



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Objective of Clinical Pathway

To provide care standards for the patient with a suspected spinal cord injury following a traumatic event (e.g., motor vehicle accident, sports or recreational injury, or fall). The Spinal Cord Injury Clinical Pathway guides care in the emergency department, intensive care, medical/surgical, and rehabilitative units to address the physical, cognitive, emotional, and social challenges associated with this type of injury.

Background

Spinal cord injury (SCI) in children and adolescents, though rare, is a serious neurologic condition associated with significant morbidity, long-term disability, and mortality (Aguirre et al., 2024; Hagan et al., 2022). Age-specific biomechanical differences in the developing spine influence injury patterns, making early diagnosis and treatment essential for optimal outcomes (Aguirre et al., 2024).

Traumatic SCI, primarily caused by motor vehicle accidents and sports injuries, affects over 300,000 individuals in the United States (National Spinal Cord Injury Statistical Center, 2025). While only 4% are under age 15, up to one-third occur in those aged 17 to 23 (Edmiston et al., 2025).

Effective management requires a multidisciplinary approach that involves communication and coordination between the medical, surgical, and rehabilitative teams (Thomas et al., 2022). Standardized neurological exams and spine imaging guide treatment, while acute medical care focuses on mitigating secondary injury by reducing neurotoxicity (Hagan et al., 2022). Immediate evaluation aims to prevent further damage and restore spinal cord perfusion through rapid assessment, targeted imaging, and timely surgical intervention when indicated (Thomas et al., 2022). The Spinal Cord Injury Clinical Pathway was developed to provide guidance in standards of care for individuals with a suspected traumatic spinal cord injury and optimize patient outcomes by addressing each phase of care.

Target Users

- Surgeons (Orthopedic, Neurosurgery)
- Physicians (Emergency Medicine, Intensivists, Hospitalists, Fellows, Resident Physicians)
- Nurse Practitioners
- Nurses
- Social Workers
- Inpatient Case Managers
- Respiratory Therapists
- Physical Therapists
- Occupational Therapists

Target Population

Inclusion Criteria

- Patient with suspected spinal cord injury following a traumatic event (e.g., motor vehicle accident, sports or recreational injury, or a fall).

Exclusion Criteria

- SCI secondary to an underlying congenital condition
- SCI secondary to acquired medical or surgical condition

Practice Recommendations

In lieu of a clinical practice guideline fully addressing the management of traumatic spinal cord injuries across the medical continuum in pediatric and adolescent patients, guidance from pediatric literature was used in conjunction with the expert consensus of the Spinal Cord Injury Clinical Pathway Committee to inform the assessment, acute management, and referral guidance in this pathway

Additional Questions Posed by the Clinical Pathway Committee

No additional clinical questions were posed for this review.

Measures

- Utilization of the clinical pathway

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased risk of missed diagnosis
- Decreased inpatient length of stay
- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers

- Variability of an acceptable level of risk among providers
- Variability in experience among clinicians
- Need for effective communication and coordination among clinicians and specialties
- Challenges with access to healthcare and health literacy faced by some families

Potential Facilitators

- Collaborative engagement across the continuum of clinical care settings and healthcare disciplines during clinical pathway development
- Anticipated high rate of use of the clinical pathway

Bias Awareness

Bias awareness is our aim to recognize social determinants of health and minimize healthcare disparities, acknowledging that our unconscious biases can contribute to these inequities

Order Sets

- PICU Acute Spinal Cord Injury Admission

Associated Policies

- There are no associated policies with this clinical pathway

Educational Materials

No educational tools were developed for this clinical pathway by the Spinal Cord Injury Clinical Pathway Committee.

Clinical Pathway Preparation

This pathway was prepared by the EBP Department in collaboration with the Spinal Cord Injury Clinical Pathway Committee, composed of content experts at Children's Mercy Kansas City. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Spinal Cord Injury Clinical Pathway Committee Members and Representation

- John Anderson, MD | Orthopedic Surgery | Committee Co-Chair
- Anne Stuedemann, MSN, RN, CPNP | Orthopedic Surgery | Committee Co-Chair
- Aaron Shaw, DO, FAAOS | Orthopedic Surgery | Committee Member
- Michael Benvenuti, MD | Orthopedic Surgery | Committee Member
- Paige Lundy, MD| Neurosurgery | Committee Member
- Kim Hartman, MD, MHPE | Rehabilitation Medicine | Committee Member
- Leslie Hueschen, MD | Emergency Medicine | Committee Member
- Jessica Wallisch, MD | Critical Care Medicine | Committee Member
- Natalee Perrin, BSN, RN, CCRN | Pediatric Intensive Care | Committee Member
- Jay Rilinger, MD | Critical Care Medicine | Committee Member

EBP Committee Members

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice

- Andrea Melanson, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Orthopedic Surgery, Neurosurgery, Emergency Medicine, Critical Care Medicine, the Pediatric Intensive Care Unit, Rehabilitation Medicine, and Evidence Based Practice.

Conflict of Interest

The contributors to the Spinal Cord Injury Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process

- This pathway was reviewed and approved by the EBP Department and the Spinal Cord Injury Clinical Pathway Committee after committee members garnered feedback from their respective divisions/departments. It was then approved by the Medical Executive Committee.

Review Requested

Department/Unit	Date Obtained
Orthopedic Surgery	October 2025
Neurosurgery	October 2025
Emergency Medicine	October 2025
Critical Care Medicine	October 2025
Physical & Rehabilitation Medicine	October 2025
Evidence Based Practice	October 2025

Version History

Date	Comments
October 2025	Version one – Development of three algorithms and synopsis

Date for Next Review

- October 2028

Implementation & Follow-Up

- Once approved, the pathway was implemented and presented to appropriate care teams:
  - Announcements made to relevant departments
  - Additional institution-wide announcements were made via the hospital website and relevant huddles
- Care measurements may be assessed and shared with appropriate care teams to determine if changes need to occur.
- Pathways are reviewed every 3 years (or sooner) and updated as necessary within the EBP Department at CMKC. Pathway committees are involved with every review and update.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) that accompany the clinical pathway.

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