

Improving Outcomes of the Acute Hospital Patients with Spinal Cord Injury

A Trauma & Rehab Services Collaborative

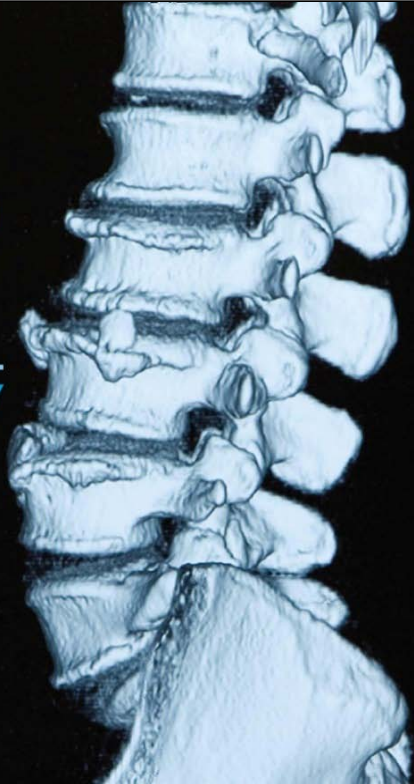
WakeMed Health and Hospitals

Elaine Rohlik, Executive Director Rehab and Trauma

Kathy Thompson, SCI Program Director, Manager Out Patient Rehab

IMPROVING
CLINICAL OUTCOMES
OF THE PATIENT WITH
ACUTE SPINAL
CORD INJURY

[A Trauma & Rehab Performance
Improvement Project]



Learning Objectives

- Demonstrate the importance of care provided from the acute care hospital on the rehab and long term outcomes of patients with SCI.
- Demonstrate how Trauma and Rehabilitation joined services to improve the quality of care provided to patients with new onset traumatic spinal cord injury.
- Apply the expertise of post acute CARF accredited SCSC to develop a coordinated comprehensive continuum of care for this specialized population.
- Describe initial accomplishments and the project's impact to the system as well as to clinical care provided to patients with a spinal cord injury.

About WakeMed Health & Hospitals

- 870-bed private, not-for-profit healthcare system based in Raleigh, NC
- Continuum of Services
 - 2 Acute Hospitals
 - 84-bed Rehab Hospital
 - Nursing Facilities
 - 10 Outpatient Rehabs
 - Free Standing ED's
 - Home Health
 - Physician Practices
- Level I Trauma Center, Center of Excellence
- CARF Accreditation in CIIRP, Stroke, Brain Injury and Spinal Cord System of Care, Center of Excellence



A wide-angle photograph of the WakeMed Health & Hospitals main building at dusk. The sky is a mix of blue and orange, with scattered clouds. The building is illuminated with warm lights, and its modern architecture features large glass windows and multiple levels. In the foreground, a road with light trails from traffic stretches across the frame.

WakeMed Health & Hospitals
The Power to Heal. A Passion for Care.

WakeMed 

WakeMed Health & Hospitals

Raleigh, North Carolina

Trauma Peer Review:

- Arrived August '08 by airmobile from scene
- 37 year old male unrestrained driver hit utility pole initially oriented required intubation at the scene. 30 minute extrication time. Reportedly unable to feel below his shoulders at scene with an "abnormally twisted neck."
- Trauma I
- C5-7 "complete" cord injury based on function/sensory exam
- 25 Injury Severity Scale (Major; 1=good, 75=fatal)
- 40% Probability of survival

Hospital Course

- Stabilization wk 1
- Tracheostomy & feeding tube wk 2
- Asystolic arrest wk 4
- Pseudomonas pneumonia mo 2
- Decubitus debridement mo 3
- Colostomy mo 5
- MRSA/VRE urinary infections
- Multiple failed sacral flaps
- Recurrent sepsis with resistant Pseudomonas
- Multiple organ failure
- Palliative care mo 6
- † mo 6
- 176 day hospitalization (6 months)

The Story Behind the Story

- Estranged from family
- ETOH present on admission, Hx of ETOH abuse
- Unemployed, Disability income from previous injury
- Depression and anxiety
- Refusal of care including turning
- Dismissal of MD and PA providers including psychiatrist
- Staff conflicted due to concerns regarding autonomy
- Staff reluctant to care for patient due to abusive behaviors
- Total charges \$1.3M, Uncompensated care

Project Inception

Trauma Peer Review Committee could not determine preventable versus non-preventable death. Identified opportunities for clinical and financial outcome improvement for management of patients with SCI:

- Hospital acquired infection rate
- Pneumonia rate
- Pressure ulcer rate
- DVT rate
- Vent days
- Foley catheter free days
- ICU days, step down days, med-surg days
- Psychosocial support
- Quality of life
- Acute hospital length of stay
- Days onset to Rehab Hospital
- Condition at Rehab Hospital admission
- Discharge percent to community
- Expense per case
- Long term functional status and quality of life

Project Structure and Milestones

- Establish steering committee
 - Trauma Medical Director
 - Rehab Medical Director
 - Trauma Program Director
 - Neuroscience Clinical Nurse Specialist
 - OP Rehab Mgr, Rehab SCI Program Director
 - Trauma Registrar
 - Rehab Administration, Project Leader
- Design functional teams and team leaders
 - Medical Stability and Skin Integrity
 - Mobility, Self Care and Independence
 - Respiratory
 - Psychosocial, Cognitive and Adjustment

Project Structure and Milestones Continued

- Conduct stakeholder input forums
 - Key stakeholder engagement meeting: project kick off
 - Action team meetings: form committees, SWOT analysis, action planning
 - Physician stakeholders forum
 - Focus group with former patients and families
- Design and work on action plan
 - Medical stability & skin integrity
 - Respiratory care
 - Mobility, self care and independence
 - Psychosocial
 - Administration
 - Data Collection and Analysis

Population of SCI

- Unique and special needs of this population
 - High acuity, High Risk, Low Volume
 - Variability with vertebral level of injury and symptoms on exam
 - High risk for medical instability and post injury complications
 - Psychosocial Situation, Response, Adjustment Issues
 - Actions in acute impact post acute and lifelong care
- Long Length of Stay
- High Expense per Case

Hospital Cost of Complications

- \$12,000 - \$30,000 Surgical Site Infection
- \$22,000 - \$26,000 Central Line Associated Bloodstream
- \$25,000 – \$28,000 Ventilator Associated Pneumonia
- \$750 - \$850 Catheter Associated UTI
- \$6,000 - \$8,000 C-dif associated disease
 - 2009 figures from CDC & Prevention
- \$27,000 PE/DVT
- as high as \$70,000 Decubitus Ulcer
 - Reddy, M, Gill SS, Rochon PA. Preventing pressure ulcers. A systematic review. JAMA. 2006; 296:974-984.

Project Goals and Opportunities

- Design Best Practice Model
 - Providing optimal care and outcomes requires specialized skills and an interdisciplinary approach to patient care.
 - Majority of patients enter hospital system in good health condition – nutrition, cardiovascular, fitness, metabolic.
 - Majority leave acute compromised in all health indicators.
- Goal: to transition the patient through the continuum of care
 - In optimal health condition
 - Using a patient centered approach to care to maximize clinical, functional and financial outcomes
 - With maximum independence and minimal burden of care
 - To home or community setting.

Project Goals and Opportunities Continued

- Provide coordinated care
 - Shared Surgical-Rehabilitation Physician Management
 - Inter-disciplinary
 - Interdisciplinary plan of care & communication systems
 - Implementation of clinical protocols, areas of agreement wherever possible and utilize communication by exceptions
 - Utilize expertise of all disciplines in care planning and decision making.
- Knowledgeable, competent and confident staff
 - Clinical education plan
 - Identified experts within departments and across continuum for internal resource pool

Initial Accomplishments

- Expansion of Spinal Cord Injury Program Director role
- Enhancement of the Spinal Cord Injury Program Committee
- Service Line Reorganization with Executive Director of Rehab and Trauma Services
- Hardwired communication systems for transfer of care between the acute care and rehab with Care and Support Team meetings, consultation for patient care and SBAR transitions.
- Clinical Education

Initial Outcomes

- No skin breakdown for 6 months
- Bowel and bladder
- Decreased vent days (from 27.5 to 19)
- Decreased onset to rehab days
- Decreased ALOS (from 39 to 27)
- Empowerment of patient
- Spasticity and Pain Management
- Improved Peer Support
- Decreased patient charges (from \$417,005 to \$383,124)

Systematic Impact

- Initiate "Routine order set for Acute Spinal Cord Injury"
- Include "SCI Team Consult" order to departmental *SCI specialists* for care planning and oversight:
 - Clinical Nurse Specialists: Neurosciences, Pulmonary, Rehab
 - PT, OT, SLP
 - Respiratory Therapy
 - Trauma Case Management
 - Dietician
 - Infection Control Prevention
 - Physical Medicine and Rehab
 - SCI Program Director

Routine Orders for Acute Spinal Cord Injury 110007	
DATE:	TIME:
MDs	Neurosurgery: <input type="checkbox"/> Trauma: <input type="checkbox"/> Other: <input type="checkbox"/> Weight: <input type="text"/> kg
Activity	<input type="checkbox"/> Flat Bedrest <input type="checkbox"/> Reverse Trendelenberg <input type="checkbox"/> Other: <input type="checkbox"/> <input type="checkbox"/> HOB elevated 30 degrees, while maintaining flat bed. <input type="checkbox"/> Logroll when turning
Vital Signs	Routine post-op VS either direct recovery from the OR or from PACU then: NICU: q 1-2 hr with neuro checks 6th Stepdown: q 2hr x first 24hr with neuro checks or: SB Floor: <input type="checkbox"/> q4hr with neuro checks <input type="checkbox"/> q4hr with neuro checks or: <input type="text"/>
Condition	<input type="checkbox"/> Critical <input type="checkbox"/> Serious <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Initiate WakeMed ACLS Orders for code situations unless DNR
Consults	<input type="checkbox"/> PT and OT (with appropriate assistive devices) <input type="checkbox"/> Other: <input type="checkbox"/> <input type="checkbox"/> Speech and Language Pathology Consult <input type="checkbox"/> WakeMed Rehab consult after patient is stable and/or transferred to SB
Nutrition	<input type="checkbox"/> NPO <input type="checkbox"/> CL <input type="checkbox"/> Regular <input type="checkbox"/> Other: <input type="text"/>

WakeMed Collaborative Plan of Care (PILOT) Acute Spinal Cord Injury		
Cervical Spine Level:		CHART BY EXCEPTION – If not "on path", document problem and plan to address; see back of each page & appropriate section. Do NOT use "problem list". ALL DISCIPLINES to chart. Note Chronic SCI – Phase I/II may not apply.
Admit Date: _____ This is a guideline and may be modified to meet needs. Does not replace MD orders or clinical judgment.		
Aspects of Care	Phase 1: ICU 1-7 days	Phase 2: Step-Down 7-14 days. Expected LOS:
Goals	<ul style="list-style-type: none"> All injuries diagnosed and communicated to team Level of spinal injury confirmed and communicated (see modified ASIA scale) Free from infection (VAP, BSI, UTI, skin disorders, falls and injury) Pain level acceptable to patient Begin patient and family education Consider early Trach and PEG if spinal injury level warrants Nutrition started within 48 hours Communication and environmental control method established as soon as appropriate. Patient to have adaptive call system for nurse and means to @reverb basic needs. Establish mobility plan ASAP 	<ul style="list-style-type: none"> Continue Phase 1 <ul style="list-style-type: none"> Family and patient verbalize comprehension of diagnosis and prognosis Bladder/Bowel training begins Tolerating PO or least restrictive diet Educate pt and family regarding all aspects of care Discharge/Rehab plan assessed and placement issues addressed Begin communication system and environmental controls as needed
Airway/Pulmonary	<ul style="list-style-type: none"> VAP protocol - Metabolol oral care/pulmonary toilet – assess need for suction q2hrs; Chlorhexidine 15ml to all oral surfaces BID, HOB 30 degrees – or reverse Trendelenberg if required, daily sedation "wake-up" with assessment of ventilator weaning unless contraindicated Begin quad cough while awake 4x q 4hrs – ask MD if any contraindications. Consider use of "Cough Assist" machine from RT BBS or TEO Chest percussion q 4-8 hrs x 15 min and pm (obtain bed module) Assess & address any abnormal ABG's & CXR's, sputum TVL, lung sounds, etc with team. Continuous pulse oximetry Wean vent and begin trach trials ASAP. Document P/F ratio daily 	<ul style="list-style-type: none"> Continue Phase 1 <ul style="list-style-type: none"> Trach trials and vent weaning Start Glottopharyngeal breathing in non trached patients (bifl breathing x 5-10) every 4 hrs during day Chest percussion q 4 hrs x 15 min, during day and pm (bed module, portable percussor or manually perform)
Circulatory/Cardiac	<ul style="list-style-type: none"> Assess and treat as indicated for LV Neurogenic shock (bradycardia & hypotension) When ready for OOL, work with OT/PT to assess and treat for orthostatic hypotension with use of abdominal binder, lower extremity air wraps or 3R table. Consider goal of MAP > 75 for the first 3 days, 65 may be acceptable 	<ul style="list-style-type: none"> Continue Phase 1 <ul style="list-style-type: none"> Monitor for 4th Autonomic Dysreflexia – prevention is key! Call MD for SBP < 90 mmHg or per MD order If bradycardia continues, assess if symptomatic; (decrease in LOC, BP & O2 sat). White rare, patient may need paramedic
Neuro Assessment/Function	<ul style="list-style-type: none"> Sensory, motor, and reflex status (see Modified ASIA scale, page 4); document within first 24hrs to ICU Assess if in Spinal Shock (usually resolves in 24-48hrs) Communicate level of injury & potential expectations with patient/family If in cervical long traction, HAO/forces – care per nursing policy Behavior Health # if drug/alcohol screen All pts get OT, PT, SLP, Rehab, Neuro CNS, Pulmonary CNS, Nutrition, Spiritual care. Additionally, Neuropsychology if concurrent head injury Others as needed such as WOCN, Cardiovascular CNS, and Neuropsychiatry 	<ul style="list-style-type: none"> Continue Phase 1 <ul style="list-style-type: none"> Reassess and document if any changes to Modified ASIA scale within 24 hrs of admission
Skin Integrity	<ul style="list-style-type: none"> Apply Mallees to receive area on admission. Change q 4hr & Sat. Continue to use until no longer on bedrest. May apply to other boney areas also as a preventive measure. If stage I develops or signs of dermatitis – consult WOCN & follow their recommendations Initiate Skin Care Orders, all SCI patients are high risk. 	<ul style="list-style-type: none"> Continue Phase 1 <ul style="list-style-type: none"> Educate pt and family on repositioning and skin assessment routines. Have pt/family demonstrate how to rotate boots



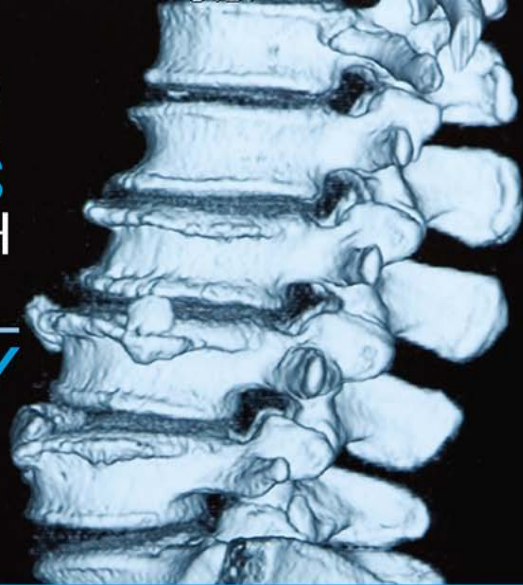
System Impact Continued

- Care Path for Tetraplegia and High-Paraplegia identifies best practice nursing cues and steps toward improved medical stability and complication prevention.
- Care will be interdisciplinary with oversight by the SCI Consult Team experts and coordination by the SCI Program Director
- Improved availability to specialized equipment with support from WakeMed Volunteer Services

Impact to Clinical Care

IMPROVING CLINICAL OUTCOMES OF THE PATIENT WITH ACUTE SPINAL CORD INJURY

[A Trauma & Rehab Performance
Improvement Project]



**ATTENTION, ALL TRAUMA TEAM, ACUTE SCI PI TASK FORCE,
AND REHAB SCI PROGRAM COMMITTEE MEMBERS!**

Please join us for an informative panel discussion, when four former SCI patients and their families share critical feedback about their experiences during their stays at WakeMed. We believe this valuable information will help us improve our processes throughout the SCI continuum of care.

Improving Clinical Outcomes of the Patient with Acute Spinal Cord Injury

A TRAUMA & REHAB PERFORMANCE IMPROVEMENT PROJECT

April 20, 2010

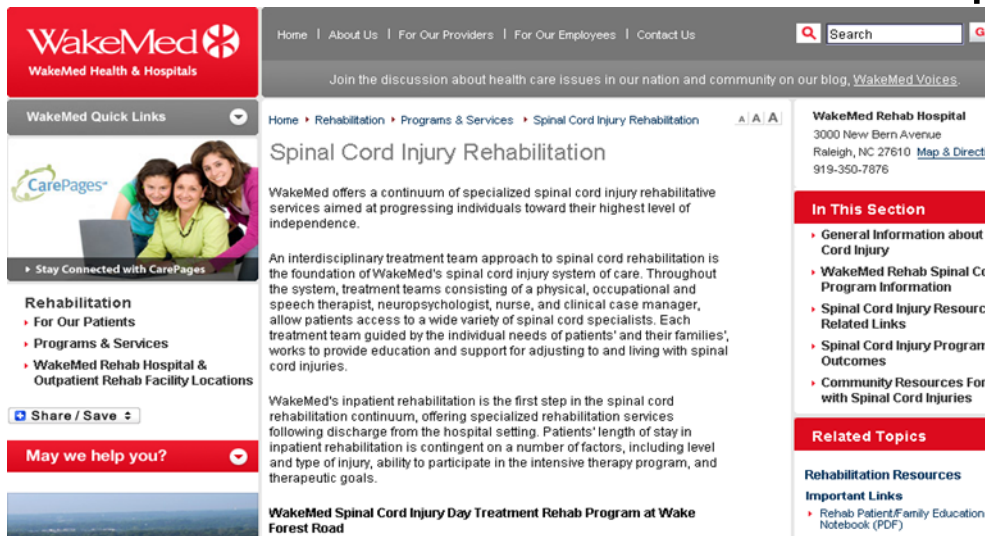
2 - 3:30 pm

Conference Dining



Staff Education

- Nursing Education Packet and on-line learning program
- Nurse Tech Education Packet
- Rehab Staff Program Orientation Reference Book
- Intranet Website available for all departments with educational resources and “SCI expert contact lists”



The screenshot displays the WakeMed website's content for Spinal Cord Injury Rehabilitation. The header includes the WakeMed logo and navigation links. The main content area features a title, a brief overview of services, and a detailed paragraph about the interdisciplinary treatment team. A sidebar on the right provides contact information for WakeMed Rehab Hospital and lists related topics and resources.

WakeMed
WakeMed Health & Hospitals

Home | About Us | For Our Providers | For Our Employees | Contact Us

Join the discussion about health care issues in our nation and community on our blog, [WakeMedVoices](#).

WakeMed Quick Links

CarePages

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Rehabilitation

- For Our Patients
- Programs & Services
- WakeMed Rehab Hospital & Outpatient Rehab Facility Locations

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May we help you?

Home • Rehabilitation • Programs & Services • Spinal Cord Injury Rehabilitation

Spinal Cord Injury Rehabilitation

WakeMed offers a continuum of specialized spinal cord injury rehabilitative services aimed at progressing individuals toward their highest level of independence.

An interdisciplinary treatment team approach to spinal cord rehabilitation is the foundation of WakeMed's spinal cord injury system of care. Throughout the system, treatment teams consisting of a physical, occupational and speech therapist, neuropsychologist, nurse, and clinical case manager, allow patients access to a wide variety of spinal cord specialists. Each treatment team guided by the individual needs of patients' and their families', works to provide education and support for adjusting to and living with spinal cord injuries.

WakeMed's inpatient rehabilitation is the first step in the spinal cord rehabilitation continuum, offering specialized rehabilitation services following discharge from the hospital setting. Patients' length of stay in inpatient rehabilitation is contingent on a number of factors, including level and type of injury, ability to participate in the intensive therapy program, and therapeutic goals.

WakeMed Rehab Hospital
3000 New Bern Avenue
Raleigh, NC 27610 [Map & Director](#)
919-350-7876

In This Section

- General Information about S Cord Injury
- WakeMed Rehab Spinal Cor Program Information
- Spinal Cord Injury Resource Related Links
- Spinal Cord Injury Program Outcomes
- Community Resources For F with Spinal Cord Injuries

Related Topics

Rehabilitation Resources

Important Links

- Rehab Patient/Family Education Notebook (PDF)
- Virtual Tour of WakeMed Rehab

WakeMed Spinal Cord Injury Day Treatment Rehab Program at Wake Forest Road



Medical Stability and Infection Prevention

- Prevent Skin Breakdown
 - Progressive sitting and ace wraps instead of Jobst stocking for compression (skin integrity, blood pressure management)
 - Mepilex
 - Maintain nutritional status, push protein, educate staff on acceptable intake
 - Patient turned q 2, skin checks twice daily
 - Conduct and teach pressure relief

Medical Stability Continued

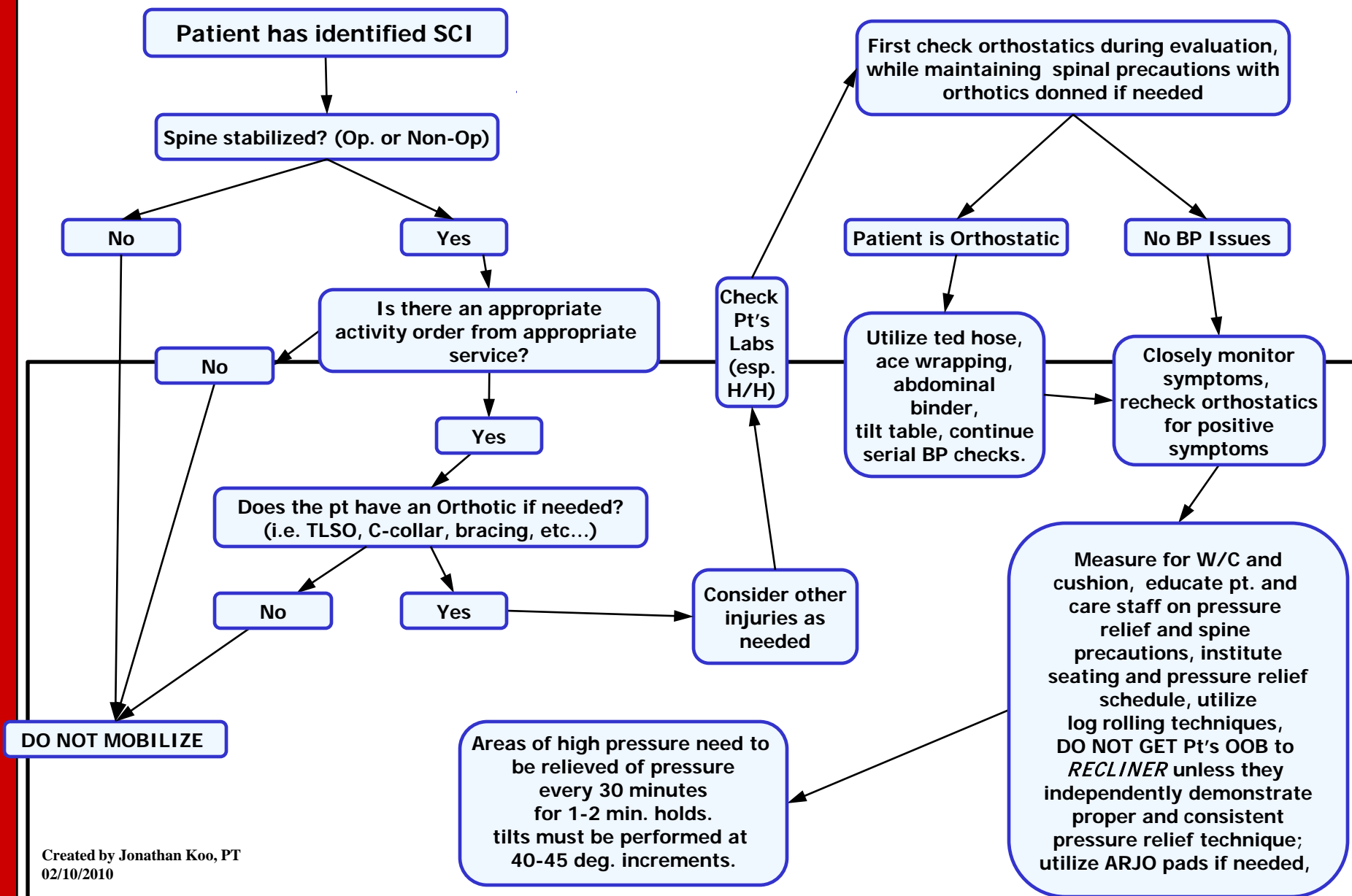
- Improved Bowel and Bladder Management
 - Early initiation of program
 - Aggressive patient education and empowerment

- Improve Respiratory Status
 - Quad Cough staff education & team oversight
 - Cough assist machine per Respiratory Therapy
 - Trach trials and weaning protocol 24/7
 - Trach versus Tube discussions with medical staff, respiratory, speech/language pathology
 - Meticulous oral/pulmonary toilet
 - Specialty beds beyond ICU
 - Respiratory “walking rounds” for all patients with a trach

Improved Mobility and Self Care

- Education to all staff on wheelchairs, cushions, adaptive call bells
- White boards in all rooms with pressure relief and out of bed schedules. White boards follow the patients.
- Early access to specialized wheelchairs and cushions.
- Improved equipment sharing between acute care and the rehabilitation hospital.
- “Equipment Closet” and specialized equipment tracking system
- Engagement of housekeeping staff
- Patient empowerment – out of bed, pressure relief, transfer techniques

Algorithm for Early Mobilization of Acute SCI Patients



Improve independence

- Establish communication assistive device protocol for patients with quadriplegia without voicing abilities
- Variable switches for environmental control
- Communication boards for patients on ventilator
- Trach versus tube for comfort, communication
- Collaboration of Speech Pathology, Respiratory and Nursing with PM valves. Enhanced staff education
- Increased availability of communication systems with improved collaboration with rehabilitation hospital
- Early assessment by Speech Language Pathology

Improve psychosocial outcomes:

- Educate Patient and Family
- Delivery of SCI education booklets to patient and/or family within 24-36 hours of admission.
- CAST – Care and Support Team Meetings with team, patient and family
- Deliberate patient/family training schedule
- Patient Centered Care – Seamless Transitions between units and venues of care.
- “Smooth Moves” patient transfers between intensive care and med/surg units
- SBAR procedure to increase communication between acute and rehab treatment teams prior to SCI patient’s admission to rehab.
- SCI Specialty Team Consultants oversee plan of care through acute

Improve Psychosocial Outcomes Continued

- Facilitate Adjustment
- peer and family support during SCI patient's acute admission
- Staff, patient and family education in Psychosocial factors affecting spinal cord injury including signs and symptoms of depression
- Peer Support
- More readily available for the patients with like characteristics and needs
- More readily available for our non-English speaking patients and families with stronger ties with post rehab patients

Next Steps

- Geographic SCI room placement
- Explore options for vent-dependent post acute care
- Oversight, outcomes with data analysis
- Increased access to adaptive equipment
- Expand clinical education
- Expand care plan and consult for the non-acute spinal cord injury patient
- Research and publication

References

- www.wakemed.org
- Robinson, L. (2006). *Trauma Rehabilitation*. Philadelphia, PA: Lippincott Williams & Wilkins.
- Early acute management in adults with spinal cord injury. (2008). *The Journal of Spinal Cord Medicine*, 31(4), 403-479.

