Guidelines for the Treatment of Thoracic/Lumbar Fractures with or without Spinal Cord Injury

*All patients with radiographic evidence of lumbar fracture(s) with or without dislocation and/or clinical or radiographic evidence of spinal cord injury **Must** be admitted to the ICU for blood pressure support. The pre-printed Spinal Cord Injury Orders will be used on all patients.*

***Note:** Admission location and monitoring criteria for patients with documented lumbar fractures without radiographic evidence of dislocation and without clinical or radiographic evidence of spinal cord injury is left to the discretion of the admitting Attending Physician. The pre-printed Spinal Cord Injury Orders will be used on all patients when appropriate.*

Standard approaches to care include:

Immobilization:

Lumbar Fracture with Dislocation:

- All patients will be maintained on strict log roll precautions until the appropriate orthosis is received and/or until definitive operative intervention has occurred.
- Definitive operative stabilization of such fracture dislocations will occur within the first 24-48 hours of hospitalization
- If orthosis is to be worn, orders will be written including: HOB limitations, use instructions including activity limitations with/without orthosis, donning practices, bathing restrictions, lifting precautions, and length of use.

Lumbar Fracture without Dislocation and without Evidence of Spinal Cord Injury:

- All patients will be maintained on strict log roll precautions until the appropriated orthosis is received and/or until definitive operative intervention has occurred. Isolated fractures deemed stable may be managed without an orthosis as determined by the Attending Physician.
- If orthosis is to be worn, orders will be written including: HOB limitations, use instructions including activity limitations with/without orthosis, donning practices, bathing restrictions, lifting precautions, and length of use.

Neurological Examination:

- Every 1-2 hours until definitive stabilization is achieved and for at least 24 hours post-operatively, unless otherwise determined by the Attending Physician. After 24 hours, the frequency of neurological examination may be progressively weaned as determined by the Attending Physician. Evaluation should be based upon the ASIA scoring system unless otherwise determined by the Attending Physician.

Steroids:

- Steroids will be administered in all patients with evidence of spinal cord injury (excluding penetrating injuries and injuries sustained below the conus) unless contraindicated by concurrent illness or injuries
    - **Load:** Methylprednisolone 30mg/kg IV over 15 minutes
    - **Infusion:** *(Begin 45 minutes after bolus)*
        - Within 0-3 hours of injury
        - Methylprednisolone 5.4mg/kg/hr IV for 23 hours
        - Within 3-8 hours of injury
        - Methylprednisolone 5.4mg/kg/hr IV for 47 hours
- All patients receiving steroids must also have the following ordered
    - Pepcid 20mg IV/PO/FT Q12 or Prevacid 30mg PO/FT Daily
    - Routine finger stick blood sugar monitoring with institution of insulin sliding scale or insulin gtt for BS $\geq$140

Blood Pressure:

- To promote spinal cord perfusion MAPs will be maintained **$\geq$90** for **7** days post injury *Pressures should be maintained using the following:*
    - Dopamine 2-10 mcg/kg/min IV
    - Phenylephrine 5-200mcg/min IV
    - When able to take PO's institute one of the following oral agents and begin weaning gtt, if indicated
        - Ephedrine 25mg PO Q6 *(maximum dose 150mg/24 hours)*
        - NaCl tablets 1-2gms PO TID *(maximum dose 4gms TID)*
        - Florinef 0.2mg PO Daily *(maximum 1mg/24 hours)*
        - Midodrine 10mg 30 min before sitting up or TID *(do not use in combination with ephedrine)*
    - Institute abdominal binding and elastic (ACE) bandages to lower extremities when placed in the sitting position or cleared for OOB activity

Respiratory:

- Aggressive pulmonary interventions including; turning and incentive spirometer use will occur every 2 hours

DVT Prophylaxis:

- Upon admit all patients will received SCS with antiembolic stockings unless contraindicated by lower extremity injuries
- Non-operative cases will receive enoxaparin 30mg SQ BID within 48 hours of admission, unless otherwise determined by the Attending Physician.
- Operative cases will have enoxaparin 30mg SQ BID started within 48 hours of surgery regardless of drain insertion.
- DVT prophylaxis in patients with traumatic brain injury, in addition to their spinal injury, will be evaluated on a case by case basis by the Attending Neurosurgeon.

Additional Treatment Guidelines:

- All patients will initially receive an indwelling foley catheter with Q2 I&O monitoring
    - The patient will intitally be allowed an attempt at self evacuation, this will be followed up with a bladder scan or straight catheterization if results provide proof of retention ($\geq$ 100cc unless history significant for BPH then may liberalize to 150cc) a routine catheterization program will be instituted
    - I&0 catherterization will begin once urine output is $\leq$2 liters in 24 hours and will be ordered in the following manner
        - I&O cathererization Q6 hours if $\geq$400cc change frequency to Q4 hours
- All patients will have the following consults within 48 hours of admission unless contraindicated secondary to instability *(emphasis on early mobilization)*
    - Physical Therapy
    - Occupational Therapy
    - Speech Therapy for Swallow evaluation
        - If unable to pass or participate in swallow evaluation; a feeding tube will be placed and nutritional support initiated within 48 hours of admission
    - Physical Medicine and Rehabilitation
- All patients with evidence of altered rectal tone, pernineal sensation, or with evidence of lack of bowel function will be started on the following bowel regimen within 24-48 hours of admission
    - Colace 100mg PO/FT BID
    - Bisacodyl Suppository 10mg PR with digital stimulation administered at the same time daily

PRACTICE MANAGEMENT GUIDELINES FOR IDENTIFYING THORACIC AND LUMBAR SPINE INJURIES FOLLOWING TRAUMA AT SAN FRANCISCO GENERAL HOSPITAL

Vertebral column injury, with or without neurologic deficits must always be excluded in the patient who has sustained a mechanism consistent with trauma. Approximately 15% of all spinal injuies occur in the thoracic region, 15% at the thoracolumbar junction, and 15% occur in the lubosacral area. If a single spinal fracture is identified there is a 14% chance of identifying a second fracture along the spinal column.

Radiologic clearance of the thoracic and lumbar spine should occur only after the hemodynamic, respiratory, and surgical stabilization of the patient. During such stabilization the thoracic and lumbar spine should be kept immobilized utilizing log roll precautions.

1. 2-views thoracic and/or lumbar spine x-rays are defined as follows:
   -Lateral Spine Radiograph: must be of good quality and adequately visualize the first thoracic vertebrae through the coccxy.
   -Anteroposterior Thoracic and Lumbar Spine Radiograph: must reveal the spinous processes T1-S1

Category 1

1. **Alert, awake, not intoxicated, without distracting injury, neurologically normal, no midline thoracic or lumbar pain or tenderness upon palpation.**

Guidelines:

1.1: Thoracic and/or Lumbar spine x-rays are not necessary.

1.2: Attending level physician makes the determination, documents this in the medical record and discontinues the log roll precautions.

Appropriate specialties:
- Emergency Medicine
- Trauma Surgery
- Orthopaedic Spine Surgery
- Neurosurgery

1.3: Optimal timing: within 2 hours after admission to the Emergency Department.

Category 2

2. Alert, awake, complaints of thoracic and/or lumbar spine pain, neurologically normal.

Guidelines:

2.1: 2-view thoracic and lumbar spine x-rays are obtained.

2.2: Axial CT images at 1 mm intervals with sagittal reconstructions obtained through suspicious areas identified on 2-view thoracic and/or lumbar spine x-rays.

2.3: If 2.1-2.2 are normal, the log roll precautions are discontinued.

2.4: Optimal timing: within 4 hours of admission to the Emergency Department.

Category 3

3. Neurologic deficits referable to a spine injury

Guidelines:

3.1: Plain films and CT images as described in 2.1-2.2.

3.2: MRI of the affected spinal area, thoracic and/or lumbar within 2 hours of admission to the Emergency Department.

CATEGORY 4

4. Altered mental status and return of normal mental status not anticipated for 2 days or more (e.g. severe traumatic or hypoxic, ischemic brain injury)

Guidelines:

4.1: Plain films and CT images as described in 2.1-2.2.

4.2: For suspected canal compromise as evidenced by a positive Axial CT, an MRI of the affected spinal area, thoracic and/or lumbar should be obtained.