

Musculoskeletal Trauma Rehabilitation

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No conflicts to declare

Objectives



After this presentation you will be able to:

1. Discuss the **guiding principles** in the rehabilitation of msk trauma patients
2. Explain the major **barriers** to progress
3. Summarize the main elements of an msk trauma rehabilitation **consult**

Road Map

- 1. Case introduction
- 2. Facts about MSK trauma
- 3. Acute trauma rehabilitation
- 4. Trauma rehabilitation and outcomes
- 5. Purpose of acute trauma rehabilitation consults
- 6. Components of acute trauma rehabilitation consult in context of case
- 7. Principles of msk trauma rehabilitation
- 8. Barriers to progress
- 9. Summary
- 10. Questions/Feedback

Case Introduction

- 35 year-old male
- Motorcycle vs car accident
- Brief LOC, GCS 14
- Fractured L distal radius, R femur, ribs, intraabdominal injuries



- ISS > 15
- Surgical repair of wrist and femur fractures
 - IMN R femur
 - Plate and screws L distal radius



Facts About MSK Trauma

- Trauma leading cause of death/disability ages 0-44 years
- 73% of traumatic injuries involve fractures



- MSK injuries > 45% inpatient rehab admissions
- *(Langlois JA, NCIPC, 2001)*
- *(Weiss, Ch.5 in L. Robinson's "Trauma Rehabilitation, 2005)*



- MVC (65%)
- Pedestrian (10%)
- Falls (15%)
- Industrial injuries (4%)
- GSW (1%)



- Lower extremity fractures commonest
 - Hip
 - Femur/tibia
- Spine/rib/pelvis
- Upper extremity fractures
 - Humerus
 - Clavicle
 - Radius/ulna



Acute Care Trauma Rehabilitation

Early Consults

- In patients with TBI, earlier (<48 hr after admission) consult resulted in:
 - better FIM transfer scores
 - better FIM locomotion scores
 - Shorter LOS stay in acute care
- *(Wagner AK et. al. Am J Phys Med Rehabil 2003)*



Acute Care Rehabilitation

- TBI patients receiving consult and acute care rehabilitation had:
 - Shorter length of rehabilitation stay – decreased by $2/3$
 - Higher cognitive levels
 - Higher discharges to home vs extended care facilities
- *(Mackay, L.E., et al. Arch Phys Med Rehabil, 1992. 73(7): 635-641)*

Acute Care Rehabilitation

- Patients with fractures post – MVC who had acute care rehabilitation had:
 - Decreased pain at 12 weeks
 - Better rate of return to usual work
- (*Brooke, K.J., et al. J Rehabil Med 2014; 46: 335–340*)



Trauma Rehabilitation and Outcomes

Evidence for Rehabilitation on Outcomes of Trauma Patients

- 993 trauma patients who were discharged to inpatient rehabilitation facility vs 26,127 patients who were not
- FIM scores improved from 63.7 to 92.2 in patients who went to an inpatient rehabilitation facility
- 9X greater chance of going home
- 40 % lower risk of death after a year

(D Nehra et. al. Journal of the American College of Surgeons, 2016)

Predictors of Outcomes After Hip Fracture Rehabilitation

- People with diabetes had lower LOSE (Change in FIM/LOS)
- Predictors of better LOSE
 - Younger age
 - Fewer medications that may predispose to falls
 - Independent ambulation prior to fracture
 - *(J Semel et al, PM&R, 2010)*





Purpose of Acute Trauma Rehabilitation Consults

1. Early identification of barriers to function

- Mild TBI, peripheral neuropathy, joint stiffness, pain
- Psychological issues

2. Prevent Complications

- Contractures
- Pressure Sores
- Infection
- Consequences of bed rest and immobility
 - Weakness, deconditioning





3. Patient / Family Education

- Provide overview of rehabilitation process, potential LOS
- Identify potential barriers to reintegration into community

4. Integration with existing teams

- Current status on patients needing inpatient rehabilitation
- ID potential barriers to rehabilitation
- Provide feedback on bed availability

5. Facilitate transfer to most appropriate facility

- Decrease LOS at acute care

6. Provide continuity of care



Targeted Trauma Patients

1. Complex trauma patients

- Multiple fractures with other injuries (eg. mild TBI, abdominal injuries),
- Extremity fractures with spine/pelvis fractures
- Frail older adults
- ISS > 15

2. Slow to mobilize

3. Patients with barriers to progressing



Predictors of Trauma Rehabilitation Patients

- Increased age
- Higher ISS score
- Increased Acute care LOS
- Lower limb injury
- *(M-J Sirois, Am J Phys Med and Rehab, 2007)*



Acute Trauma Rehabilitation Consult Components

Step 1

- Evaluate the mechanism
 - Visualize
 - Assess fit with actual injuries
 - Reveal potential “other” injuries



Step 1 Case

- TBI
- L wrist and R femur
- + L Rotator cuff tendinopathy



Step 2

- Assess injuries, impact on function
- TBI – 30%
 - Cognitive screen
 - Alertness
 - STM
 - Orientation
 - Executive function



Step 2

- Physical screen
 - Active/passive movement
 - Wounds
 - Strength
 - Neurological function
- Fractures and their potential impact on mobility



Step 2 Case

- Fractures stable
- Wounds clean
- ROM limited in fracture sites
- Neurologically intact
- Anxious, tearful
- TBI
 - Cognitive screen
 - Alert
 - PTA
 - STM, executive function, orientation intact



Step 3

- Assess current function
- Compare to Baseline
- Determine the gap, feasibility to bridge the gap



Step 3 Case

- Function
 - Hoyer lift for transfer
 - Limited mobility
 - Dependent in ADL's



Step 4

- Reverse engineer the goals, and what is needed to get there
- Assess resources
- Formulate plan for rehabilitation



Step 4 Case

- Reassurance
- Psychiatry
- Home assessment
- APS



Step 5

- Communicate your assessment to:
 - Patient
 - Family
 - Teams



Step 5 Case

- Patient and wife anxious about future
- Family supportive
- Acute care team aware of need to involve psychiatry, provide emotional support
- Inpatient rehab team aware of needing to provide care plan



Principles

1. Early/Accelerated Rehabilitation Leads to Improved Outcomes

- RCT with accelerated rehabilitation post proximal femoral fractures
- Accelerated rehabilitation
 - Nurse care plan
 - Physiatrist/geriatric consultation
 - Early mobilization
 - Contact with family/caregivers
- 20% reduction in LOS
- Improved functional independence (BI)
- *Disability & Rehabilitation. 15(1):29-34, 1993 Jan-Mar.*



2. Maintain Bone Stability

- Facilitate bone healing
- Decreases complications
- Mitigates pain



3. Manage Pain

- One of the biggest barrier to progress
- Use lowest doses of opioids/plan to taper
- Other pharmacotherapy
 - Acetaminophen
 - Gabapentin
 - Pregabalin
 - Ketamine
 - Diclofenac gel
- Use adjunctive therapy liberally
 - Positioning, ice, seating in wheelchair



3. Manage Pain

- Assistive devices with adequate pressure relief
- Orthosis
- Psychological intervention



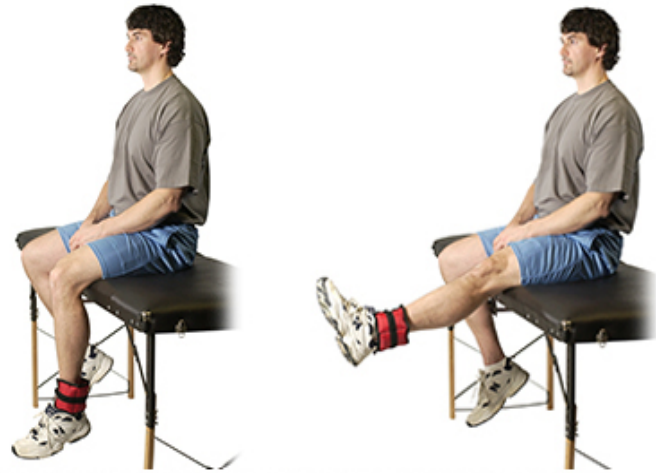
4. Optimize ROM and Strength

- Functional impact
- Knee, elbow
- Scapular stabilizing, hip girdle, quadriceps muscle groups



4. Optimize ROM and Strength

- Knee extension/hip abductor strength impaired with IMN of femur
- Normalize gait



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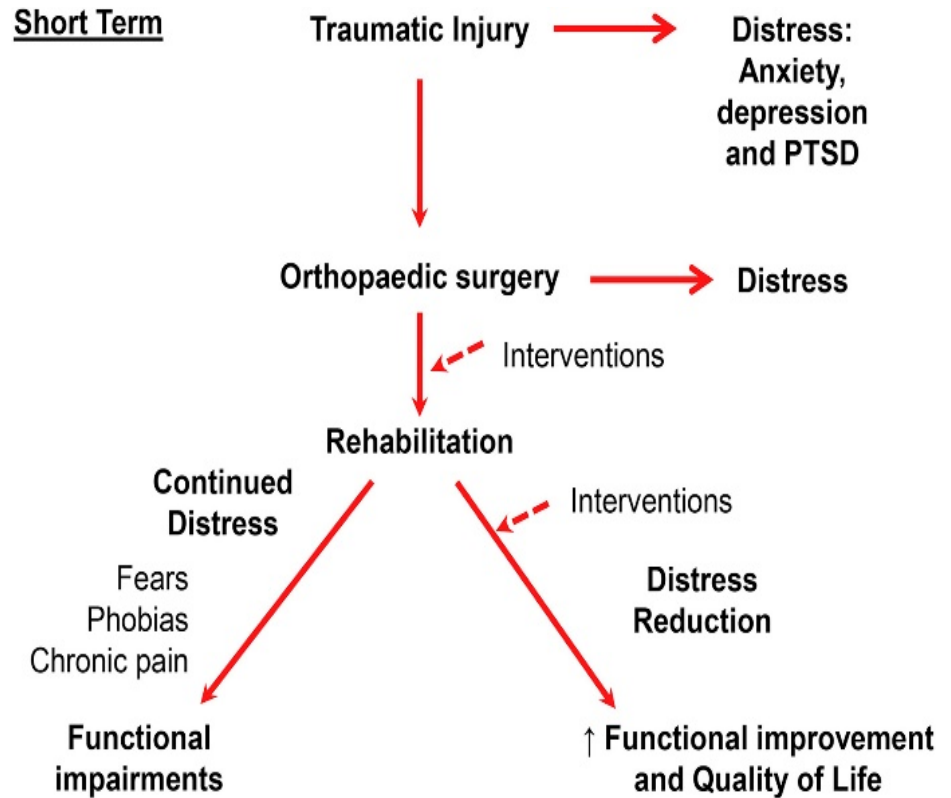
5. Optimize Psychological Health

- Major barrier to progression
- 21-67% depressive mood
- 50% anxiety, driving phobia
- 20-40% PTSD



5. Optimize Psychological Health

- Involve psychiatry/ psychology early
- Combo of meds/CBT or CBT helpful



Barriers

1. Psychological Health

- Major impediment to progress
- May be previously undiagnosed
- Needs to be optimized



2. Pain

- Multimodal, interdisciplinary approach effective
- Treat early
- Consistent health team member
- Communication vital



3. Complication or New Diagnosis

- Pain may be indicative of underlying complication
 - Infection
 - Malunion
 - New or undiagnosed fracture
 - Compartment syndrome
 - DVT



Summary

- 3 leading causes of msk trauma – MVC, pedestrian, fall
- Rehabilitation – improved outcomes – pain, RTW, FIM scores, return to home
- Early consults
- Target complex trauma, older patients, lower limb injuries
- 5 Steps to trauma rehab consult

Summary

- Evaluate mechanism
- Assess patient
- Determine gap between current and expected function
- Reverse engineer how to bridge gap
- Communicate to patient, family and teams
- Principles
 - Early rehabilitation
 - Maintain bone integrity
 - Manage pain
 - Optimize ROM and strength
 - Optimize psychological health
- Barriers – Psychological health, pain, complication/new diagnosis

Questions/Feedback?

