Rehabilitation of Combat Trauma

JT Scholz, DO, Ph.D.

Walter Reed National Military Medical Center,

Bethesda, MD
Disclosures

- I have Nothing to disclose, I am here on my own dime, and that and $1.00, will get me a cup of coffee.

- The views expressed in this presentation are those of the author and do not reflect the official policy of the Department of Army, Department of Defense, or U.S. Government.
Learning Objectives

Learner will:

- Understand the multi-discipline nature of recovery
- Understand the steps involved in Combat Trauma Care (CTC) and rehabilitation
- Define and understand the what physiatry is and the role in MTF
- Define the role that pain management plays in the role of rehabilitation
- List our allied medical personalell involved in rehabilitation of the CTC Patient.
- List the acute, sub acute and long term needs of a CTC patient.
- Define the responsibility/roles for care: VA vs. MTF vs. Civilian
- Be able to outline the process of combat trauma care CTC) from injury to completion of care.
General Direction today.

- Combat trauma
- Definition
- Who is involved
  - People
  - Specialties
  - Process
- Timeline of care
  - MTF, VA, Civ.
  - Return to duty
- Questions
Overview: Combat wounded

- Complex medical care.
- Multidiscipline
  - Field evacuation, to regional, and definitive MTF
  - Trauma (TACS), ortho/gen Surg/plastics, Med, Rehab (PMR).

PMR-Rehab is multi-discipline by definition
- Ortho, Plastics, PMR, PT, OT, Bev health, Social support, Military.
- Next steps.
  - VA, RTD, Civ.

During higher flow, vs. lower flow.
- Teams, SOP in place support
- SOPs, turnover, different standard of care.

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Vocabulary

- PMR, Physical medicine and Rehabilitation, physiatry (phezz-eye-it-tree)
- Multi-discipline: driving the direction of care
  - All members must have equal input
  - Must have *sense of value* of their input
- MNA—Non Medical Attendant
- MEB—Military Evaluation Board
- Command interest—The solider is a resource..
Combat Trauma

- GSW, IED, MVA,
- Multi-trauma
- Ortho
- Burns
- Internal Damage
- TBI
- Psychological
- Combo’s of the above…
Current situations:  
Same problems as previous wars…

- Gunshot wounds, landmines, bombs etc..
- Bigger guns, IEDs, Chemical??
  - Better aim, closer
  - Remote trigger
  - Suicide vest
- Getting closer…
  - City fighting vs. open field
  - Results…
- Worse outcomes.
Protect thy solder

- Better Amour
  - Slide of amour for beginning of Vietnam
  - Recent wars
  - New wars
  - Current

- Better Vehicles
  - Stryker, Armored Humvee,
  - Vs. Jeep?
Decreased time to treatment.

- Armor
- Rapid evacuation
- Early medical attention
- Better Medical protocols
- Increased survival rate of multi-trauma service members
Result...

- Service member (SM) alive, but very badly injured.
Combat Trauma injured SM

● Very complex Patient
  – Complex wounds
  – Co-morbidities
  – Vision loss
  – Spinal cord Injury
  – Traumatic Brain injury
  – Fractures
  – Severe Neurological or Vascular injury
  – Behav. Health/SW

● Support System variability

● Premorbid conditions
How to provide care?

- Optimal Care = well functioning and coordinated multidisciplinary teams.
- Clearly stated scope and responsibilities
- Each member is recognized
  - Valuable role
  - Equal importance
  - Voices heard
Teams of specialist

- TBI Clinics
- Amputee Clinics
  - Prosthetics Clinics
  - Wheel Chair Clinics
- Multi-trauma Rounds
- Pain-Psych Team
- Complex Wound Care
  - Special tam
  - Coordination with Nursing
Other considerations . . .

- Medicine
- Surgery
- Ortho/TACS/Hand
- PCLS
- OT/PT/SLP
- Plastics
- Urology
- Other
Chaos, vs. concert

- Physiatrist as *conductor*
  - Primary care provider for the wounded SM
  - Coordination and recommending the interventions
  - Systems
  - Specialist
  - MTFs vs. VA

- Holistic
- Education & communication
Education

- Stakeholders
  - Patient
  - Family
    - Spouse
    - Parents
    - Children

- Medical services
  - “…mine is most important” vs.
  - What is best for patient
    - Now vs. later

- Where can SM get the best service?

- Other considerations...
The rehab team

- Physiatry & others.
  - It not always good to be *king*…
- PT
  - “…how to get there”
- OT
  - “…What to do when you get there”
  - Types
    - TBI
    - Optometry
    - Hand
    - Driving
    - Brian training
- Prosthetics
- Pain/Psych
- DME
Communication

- Clear roles and duties/responsibilities
- Regular meetings
- Direct communication
- Ongoing education
- Monthly Programmatic meeting
  - With Directors share
    - Ideas to maximize efficiency and QOC
Example amputee arrival

- Arrival at WRNMMC
  - Triage in Ortho/Surgery/Medicine/TACS
- Inpatient vs. out patient
- IP: Service
  - PMR consult in 24hrs
  - Transfer to PMR <72 hrs.
  - IP ward
  - Clinics
  - Return to Duty, vs. VA, Vs. Tricare Network
Outpatient

- Housing
- Clinics
  - PMR (unique)
    - Pain
    - Amputee
    - Wheel chair
  - Recreation Sports
- VA/Tricare system
  - For life
  - Return to duty

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Pain Management

- **Initial control for pain from injury**
  - PCA--Perioperative

- **Secondary control for pain due to surgery**
  - PCA convert Long Acting opioids at definitive surgery

- **Tertiary control for pain from therapy**
  - Short acting for breakthrough and pre medication prior to Therapy

- **Other,**
  - Anticonvulsants (Gabapentin, Oxycarbamazepine, Lamotrigine)
  - TCA (Nortriptyline, Amitriptyline, Desiprimine)
  - NSIAD (COX2) (given the anticoag)
  - Sleep aid/nightmares (Quetiapine fumarate)
Non-Pharmacological agents

- ICE/HEAT
- Desensitization
- Transcutaneous Electrical Nerve Stimulation (TENS)
- Acupuncture
- OMT
- Chiropractic
- PT-body work
- Recreation therapy
Regional anesthesia team

- Peripheral infusion catheters
  - brachial/LS plexus
  - sciatic nerves
- Positive effect on pain control
- Reduction of medication use
- Increase in participation of therapy
A word about opioid addiction

- Control for pain at time of cause, and for promotion to next level
- Opioids are for the right time, and the right injury
- Reinforce long acting over short, and revise often
Pain Management The whole world is watching.

- JCAHO, ACGME, sub specialties unto selves.
- Experience at WR requires a multimodal approach.
- Exercise to re-enforce learning
Medical management:
Multiple comorbidities and higher risk for secondary complication

- **Increased risk for DVT**
  - Intact limbs, and body because of long periods of being motionless.
  - Prophylaxis-Low molecular weight Heparin (enoxaparin), unless counter indicated

- **Heterotopic ossification (HO)**
  - High energy injury, younger age, TBI, or other cause
  - Additional pain, skin Breakdown
  - Trouble with prosthetics, and joint ROM, Return to duty.

- **HO Treatment**
  - COX2,
  - HO and DVT in healthy populations:
    - Low-grade fever
    - Medical vigilance is improve
Medical management: Continued…

- Comorbid Head injury
  - Posttraumatic seizure precautions
  - Levetriactam (Keppra)
  - Trained staff to handle these patients

- Blood loss
  - Epo—stimulate blood loss
    - Promotes healing
    - Inc. energy during therapy
TBI

DoD Numbers for Traumatic Brain Injury Worldwide - Incidence by Severity

No. of cases

Calendar year

Source: Defense Medical Surveillance System (DMSS), Theater Medical Data Store (TMDS) provided by the Armed Forces Health Surveillance Center (AFHSC)

Prepared by the Defense and Veterans Brain Injury Center (DVBIC) 2000-2013
Surgical Consideration:

- Combat wounds extensive, but challenging
  - Contaminated w/ dirt, bacterial and shrapnel
- Co-management with multiple surgical subspecialties
  - Ortho, Vascular, plastics, NS, TACS
- Limb salvage vs. Limb amputation
  - Patient/family preference, vs. Medical call
  - Patient satisfaction lower with LS vs. Amp.
Amputation of limbs

- **Upper Limb**
  - Comorbid fractures, Plexus injuries, soft defects, graft healing time
  - Post operative period: ID myoelectric control sites

- **Lower limb**
  - CAD-CAM for socket fit and changes
  - Microprocessor Knees and Dynamic response feet
  - Enhance function but promote more rapid progress in therapy

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High Tech therapy

- 3-D motion analysis gait laboratory
- Experienced therapist
- CARREN
- Custom labs
  - Assistive technology
  - 3d printers
    - plastics
    - Ti.
Computer Assisted Rehabilitation Environment (CAREN)
GME

- Ongoing military-specific curricula help military facilities stay current
  - Medicine, Surgical, and Rehabilitative approaches to care.
  - Cutting edge moving medicine forward

- WRNMMC
  - Only PMR residency in the DOD
  - Vital & Active research program intervention
Peer and Psych social support

- Professional psychological and peer support
  - VA
  - Red cross
  - Amputee Coalition of America
  - Local volunteers
  - Emotional support and valuable feedback
    - PT progress
      - Physically and Mentally
      - Guidance through the military medical system
Sport as therapy

- National Disabled Veterans
  - Winter Sports clinics
- ACA
- Disabled Sports, et al
- Therapy vs. Recreation
  - Can be both
Recreation sports.
Family support

- Family Assistance Center (FAC)
- Support for the care givers
  - Medical
  - Psychological
- NMA
Discharge Planning

- Starts at day one…
- SW, Nurse Case managers,
- Coordinating continued care
  - Different agencies
  - Discharge
  - Equipment purchases
  - Grants
  - Outpatient housing

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Military Medical Disability System

- Navigation, can be daunting
- Service promotes communication and standardization
- Doctors’s need to be education and experienced on MEB.
- Physical Evaluation Board Liaison Officer (PEBLO) and VA counselors
  - Pt. awareness of benefits
Tailoring programs to fit the needs of the patient

- Optimal disposition of patients
  
  Geographical challenges
  
  Patients duty station
  
  Home of record vs. nearest military vs. VA medical facility in proximity
Coordination throughout TRICARE MIL. HC System

Variability in standard
- variability in private
- public sectors across the US

Partnerships with
- DOD
- VA
- MTF
Conclusion

- Last 10-15 years cultural shift within the military (and society)
- Individuals with major combat trauma and even limb loss can remain active duty service
- Medical/technoical rehabilitative advances
- Prosthetics design, and the service members forcing the developer to innovate
- WRNMMC is committed to allowing all wounded to reach therein maximal function and return to the highest possible quality of life
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Questions:

- JT Scholz, DO, Ph.D.
- joseph.t.scholz.mil@mail.mil
- Scholzjo@gmail.com
- (301) 520.2684
References:

- Collener et all, Roadmap for future amputee care research, Care of the combat amputee. Chapter 28.