

# **Depression and PTSD in Orthopedic Trauma**

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# PTSD and Depression

- Objectives

- What is PTSD and depression and how are they distinguished?
- How prevalent is post-traumatic stress disorder and depression after acute trauma in the orthopedic trauma population?
- What resources are available for patients with suspicion of either PTSD or depression?

# PTSD and Depression

- Orthopedic injuries play a significant impact on society
  - Year 2000, productivity losses from lower extremity injuries alone was \$17.5 billion
    - 75% more than the losses of nonfatal traumatic brain injuries
    - 50% more than the losses from nonfatal upper extremity injuries
    - 6 times more than losses from nonfatal spinal cord injuries.<sup>1</sup>

# Question

- What is PTSD and depression and how are they distinguished?



# Depression

- **Persistent sadness, decreased ability to experience pleasure and decreased interest in usual activities.**
- **May result from the traumatic experience or from the chronic disability as a result of injury.**

# PTSD

- **(DSM-IV-TR) require**
  - **Development of symptoms as a result of an identifiable trauma with these three symptoms present:**
    1. **Re-experiencing the event**
    2. **Avoidance and emotional numbing**
    3. **Hyperarousal for a duration greater than 1 month and must affect behavior.**

# PTSD-Risk Factors

- Young age
- Female gender
- Poor education
  - Not graduating highschool
- Lower socioeconomic class
- Alcohol abuse
- Drug abuse
- Pain
- Cognitive deficit

# Longitudinal relationships between anxiety, depression, and pain: Results from a two-year cohort study of lower extremity trauma patients



Renan C. Castillo <sup>a,b,\*</sup>, Stephen T. Wegener <sup>a,b</sup>, Sara E. Heins <sup>a</sup>, Jennifer A. Haythornthwaite <sup>c</sup>,  
Ellen J. MacKenzie <sup>a</sup>, Michael J. Bosse <sup>d</sup>, the LEAP Study Group <sup>1</sup>

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## PTSD-Risk Factors

- Identified a recurring relationship between pain and associated psychological distress
  - pain and psychological stress can exacerbate each other during the chronic stage of trauma



# A Prospective Investigation of Long-Term Cognitive Impairment and Psychological Distress in Moderately Versus Severely Injured Trauma Intensive Care Unit Survivors Without Intracranial Hemorrhage

*James C. Jackson, PsyD, Kristin R. Archer, PhD, Rebecca Bauer, MD, Christine M. Abraham, MA, Yanna Song, MA, Robert Greevey, PhD, Oscar Guillaumondegui, MD, E. Wesley Ely, MD, and William Obremskey, MD*

## PTSD and Depression-Risk Factors

- Cognitive Deficit
  - Prospective study
    - 55% of patients with ISS score >15 had cognitive deficit
      - Clinically significant symptoms of depression and PTSD occurred in 40% and 26% of patients, respectively in patients with cognitive deficit

## **Long-Term Posttraumatic Stress Disorder Persists after Major Trauma in Adolescents: New Data on Risk Factors and Functional Outcome**

Holbrook, Troy L. PhD; Hoyt, David B. MD, FACS; Coimbra, Raul MD, FACS; Potenza, Bruce MD, FACS; Sise, Michael MD, FACS; Anderson, John P. PhD

### **PTSD-Stressors**

- **A lack of control of the situation leading up to the traumatic event and/or death of a family member at the scene**

# Pain in the aftermath of trauma is a risk factor for post-traumatic stress disorder

S. B. Norman <sup>(a1)</sup>, M. B. Stein <sup>(a1)</sup>, J. E. Dimsdale <sup>(a1)</sup> and D. B. Hoyt <sup>(a1)</sup> 

DOI: <https://doi-org.proxy.library.vanderbilt.edu/10.1017/S0033291707001389> Published online: 10 September 2007

## PTSD-Risk Factors

- 115 patients evaluated using the Visual Analog Scale (VAS) at a level one trauma center
  - identified pain as a risk factor for the development of PTSD
    - An increase of  $\frac{1}{2}$  of a standard deviation on the VAS was found to have a 5 fold increase at 4 months and 7 fold increase at 8 months post-discharge

# Psychopathology and resilience following traumatic injury: A latent growth mixture model analysis

deRoos-Cassini, Terri A. ✕; Mancini, Anthony D. ✕; Rusch, Mark D. ✕; Bonanno, George A. ✕. *Rehabilitation Psychology* 55.1 (Feb 2010): 1-11.

## PTSD-Time of Presentation

- **Variable**
  - **Present with PTSD symptoms as early as the initial hospital stay.**
  - **At one to 6 months post discharge**
    - **Some developed worsening symptoms**
    - **Others symptoms will improve**
    - **Some will have the same severity throughout.**

# **Long-Term Multidimensional Functional Consequences of Severe Multiple Injuries Two Years After Trauma: A Prospective Longitudinal Cohort Study**

*Helene Lundgaard Soberg, MSc, Erik Bautz-Holter, MD, PhD, Olav Roise, MD, PhD, and Arnstein Finset, PhD*

## **Outcomes**

- Orthopedic trauma patients were one standard deviation below the healthy population
  - almost one third of these patients having a diagnosis of PTSD

# Posttraumatic Stress, Problem Drinking, and Functional Outcomes After Injury

*Douglas F. Zatzick, MD; Gregory J. Jurkovich, MD; Larry Gentilello, MD;  
David Wisner, MD; Fredrick P. Rivara, MD, MPH*

## Outcome

- 101 trauma patients
  - evaluated at admission and again at 1 year.
  - PTSD had the strongest association with outcome.
    - demonstrated adverse outcomes in 7 of 8 domains of the SF-36 compared to patients without PTSD.

# A National US Study of Posttraumatic Stress Disorder, Depression, and Work and Functional Outcomes After Hospitalization for Traumatic Injury

*Douglas Zatzick, MD,\* Gregory J. Jurkovich, MD,† Frederick P. Rivara, MD, MPH,‡ Jin Wang, PhD, MS,‡ Ming-Yu Fan, PhD,\* Jutta Joesch, PhD,\* and Ellen Mackenzie, PhD§*

## Outcome

- Measured extent and severity of functional impairment at 12 months through the use of the Form-36 (SF-36) work questionnaire.
  - significantly increased impairments in all functional domains, associated with elevated odds of one or more ADL impairments
  - 3X increase of PTSD and five to six fold increase of PTSD plus depression.

# Question

- How prevalent is post-traumatic stress disorder and depression after acute trauma in the orthopedic trauma population?



# Ethnic Differences in Posttraumatic Stress Disorder After Musculoskeletal Trauma

*Allison E. Williams, ND, PhD, Wade R. Smith, MD, Adam J. Starr, MD, Denise C. Webster, PhD, Ruby J. Martinez, PhD, Carol P. Vojir, PhD, Jurate A. Sakalys, PhD, and Steven J. Morgan, MD*

## Prevalence

- 32/106 qualified for PTSD (30%)
  - 19 for depression
  - 16 qualified for both PTSD and depression.
    - association between PTSD and depression was significant ( $p < .01$ ).

# Ethnic Differences in Posttraumatic Stress Disorder After Musculoskeletal Trauma

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## Prevalence

- 32/106 qualified for PTSD (30%)
  - SF-36
    - Patients with PTSD had significantly lower scores on the SF-36 subscales.
    - Those with both PTSD and depression had significantly lower scores than patients who had neither PTSD or Depression.

## **Psychological distress associated with severe lower-limb injury.**

McCarthy ML<sup>1</sup>, MacKenzie EJ, Edwin D, Bosse MJ, Castillo RC, Starr A; LEAP study group.

### **Prevalence**

- Patients reported elevated levels of psychological distress compared to age and sex matched cohorts.
  - **17-20%** of the patients reported severe levels of depression, phobia and anxiety

# Fracture Repair: Successful Advances, Persistent Problems, and the Psychological Burden of Trauma

By Adam J. Starr, MD

## Prevalence

- Used a Revised Civilian Mississippi Scale for Posttraumatic stress disorder on 580 persons at two level one trauma centers.
  - **51%** of these patients met the criteria for PTSD including **57%** of those involved in motor vehicle accidents and **65%** of the pedestrians struck by a motor vehicle.

# Posttraumatic Stress Disorder Associated With Orthopaedic Trauma: A Study in Patients With Extremity Fractures

*Chang Hoon Lee, MD,\* Choong Hyeok Choi, MD,\* Sang-Young Yoon, PhD,† and Jin Kyu Lee, MD\**

## Prevalence

- Korean study on 148 men who had one or more long bone fractures
- Used Korean version of the PTSD scale
  - **27%** met the criteria for the diagnosis of PTSD
- Lower extremity fracture, multiple extremity fracture and higher pain visual analog scale were significantly related to the occurrence of PTSD

# Amputations

Acta Orthop Belg. 2010 Feb;76(1):90-3.

**Acute stress disorder and post-traumatic stress disorder following traumatic amputation.**

Copuroglu C<sup>1</sup>, Ozcan M, Yilmaz B, Gorgulu Y, Abay E, Yalniz E.

- During the early post traumatic period
  - **36.3%** of patients were being treated for PTSD
- By year five, the percentage drastically rose to 77.2%.



# DEPRESSION IN ORTHOPAEDIC TRAUMA PATIENTS

## PREVALENCE AND SEVERITY

BY RENN J. CRICLOW, MD, PATRICIA L. ANDRES, MS, PT,  
SUZANNE M. MORRISON, MPH, STEPHEN M. HALEY, PhD, PT, AND MARK S. VRAHAS, MD

*Investigation performed at Brigham and Women's Hospital and Massachusetts General Hospital, Boston, Massachusetts*

## Lower Extremity Injuries

- Lower extremity injuries have a high incidence of PTSD.
- 161 patients 3 to 12 months post discharge
- A subset of 99 patients with lower extremity injuries
  - 57% of patients had a minimal level of depression
  - 26% moderate level of depression
  - 6% had severe levels of depression





## ONE-YEAR PROSPECTIVE FOLLOW-UP OF MOTOR VEHICLE ACCIDENT VICTIMS

EDWARD B. BLANCHARD<sup>\*1</sup>, EDWARD J. HICKLING<sup>1,2</sup>,  
KRISTINE A. BARTON<sup>1</sup>, ANN E. TAYLOR<sup>1</sup>, WARREN R. LOOS<sup>2</sup>  
and JACQUELINE JONES-ALEXANDER<sup>1</sup>

<sup>1</sup>Center for Stress and Anxiety Disorders, University at Albany-SUNY, 1535 Western Avenue, Albany, NY 12203, U.S.A. and <sup>2</sup>Capital Psychological Associates, Albany, NY, U.S.A.

## Acute Stress Response and Posttraumatic Stress Disorder in Traffic Accident Victims: A One-Year Prospective, Follow-Up Study

Danny Koren, Ph.D., Isaac Arnon, Ph.D., and Ehud Klein, M.D.

Aust Health Rev. 2001;24(1):128-35.

## Long-term needs of motor vehicle accident victims: are they being met?

Jeavons S<sup>1</sup>.

## MVC's

- More than **25%** of survivors experienced PTSD with even more meeting the subthreshold criteria.
- **> 50%** of the motor vehicle crash survivors with PTSD at 1 year still had the diagnosis 2 years later.



# DEPRESSION IN ORTHOPAEDIC TRAUMA PATIENTS

## PREVALENCE AND SEVERITY

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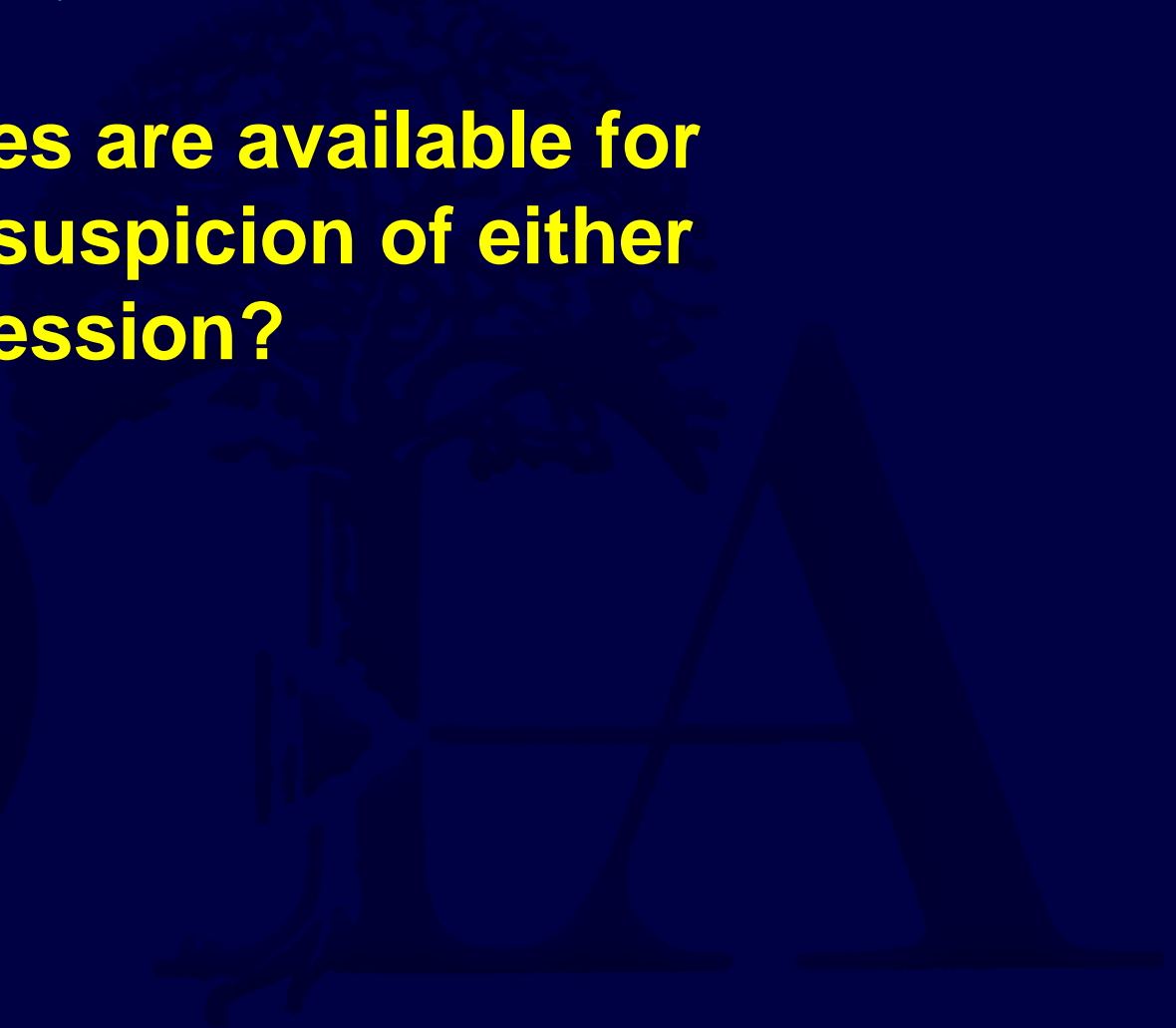
## Depression

- 116 patients found a relationship between injury severity and level of depression.
  - 55% of patients minimal depression
  - 28% experienced moderate depression
  - 13% experienced severe depression.
- Patients with open fractures were 4.6 times more likely to experience depression



# Question

- **What resources are available for patients with suspicion of either PTSD or depression?**

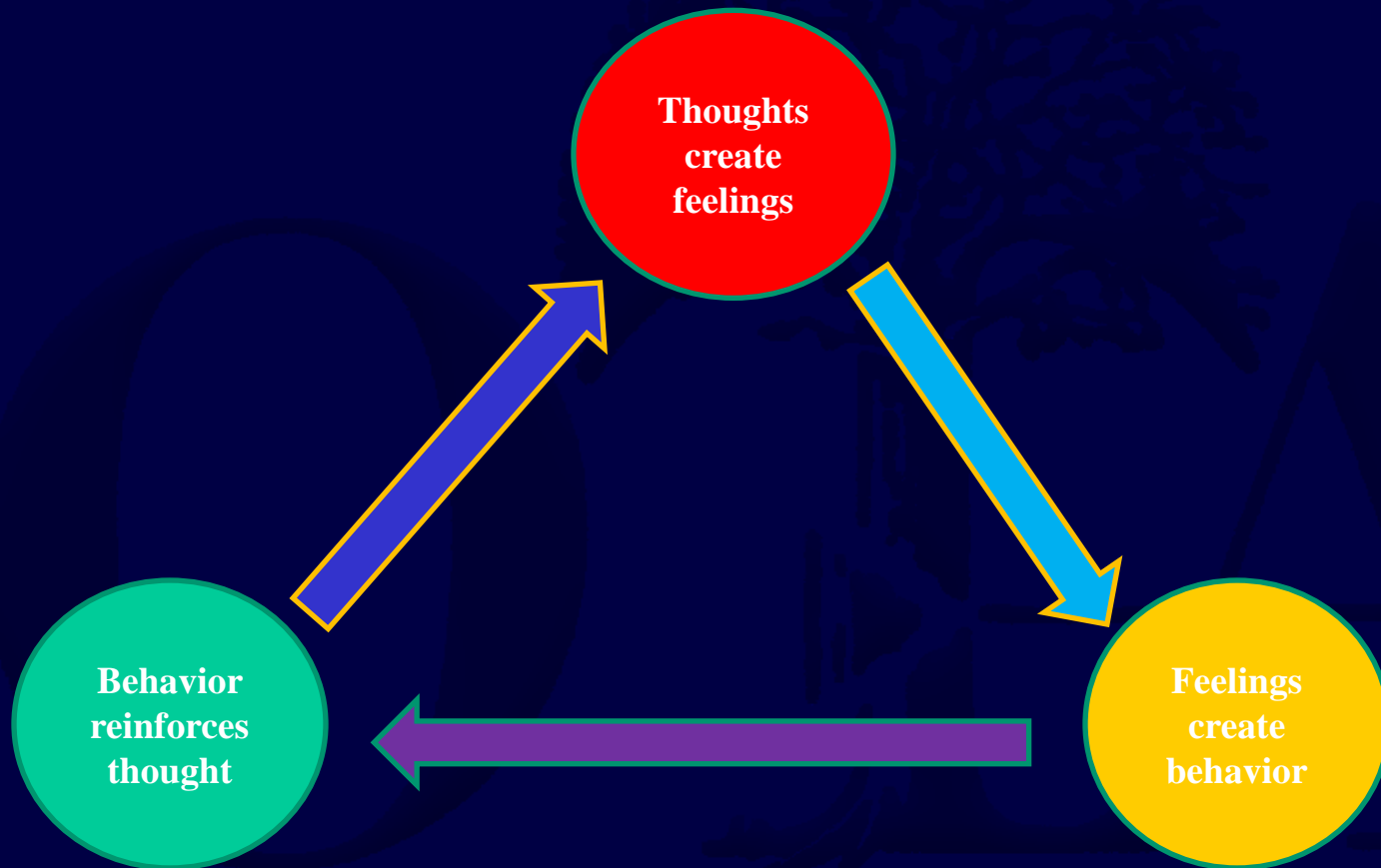


# Treatment

- PTSD and Depression-Nonpharmacologic
  - Cognitive behavioral therapy (CBT)
    - focus on changing perception after trauma along with exposure to provocative stimuli in a controlled manner.
  - Immediate one time cognitive behavioral therapy not effective
  - Long term therapy needed

# Treatment

- PTSD and Depression-Nonpharmacologic
  - Cognitive behavioral therapy (CBT)



Early cognitive-behavioural therapy for post-traumatic stress symptoms after physical injury

Randomised controlled trial

JONATHAN I. BISSON, JONATHAN P. SHEPHERD, DEBORAH JOY, RACHEL PROBERT, ROBERT G. NEWCOMBE

The British Journal of Psychiatry Dec 2003, 184 (1) 63-69; DOI: 10.1192/bjp.184.1.63

## Treatment

- PTSD and Depression-Nonpharmacologic
  - Randomized control trial on 152 patients by
    - four sessions of **CBT** 5-10 weeks after injury
      - significantly lower total impact of event scores compared to those not receiving any intervention.

# Treatment

- PTSD and Depression-Pharmacologic
  - antidepressants
    - **Selective serotonin reuptake inhibitors (SSRI)**
    - **Sertraline and Fluoxetine are the SSRIs that are most commonly used.**
  - Tricyclic antidepressants, monoamine oxidase inhibitors and anticonvulsants are also used
  - Benzodiazepines for PTSD has fallen out of favor due to the vulnerability of this patient population to develop addiction.<sup>34</sup>

# Treatment

- **Trauma Collaborative Network**

- focus on the relationship between a patient and physician.
- coordinates resources to patients addressing psychosocial sequelae after trauma.
- focuses on the need to empower patients and assume more responsibility for recovery and the need to be proactive.
- implemented by creating proactive practice teams which are molded by training providers to facilitate patient engagement

# Treatment

- **Trauma Survivors Network**

- Developed by the American Trauma Society in conjunction with John Hopkins University
- Standardized program used in multiple trauma centers throughout the United States([www.traumasurvivorsnetwork.org](http://www.traumasurvivorsnetwork.org))
- Shown to be effective in improving functional outcomes and quality of life.



# Treatment

- **Trauma Survivors Network**
  - consists of
    - Timely access to information for patients and families through access to the TSN website, and Trauma Patient and Family Handbook
    - Peer support provided by visitation of experienced trauma survivors and regular support groups and an online social networking website
    - Family education classes;

## Treatment

- **Trauma Survivors Network**
  - consists of
    - A self-management class:
      - NextSteps, offered both online and in person
    - The goal of components is to increase patient self-efficacy, support network, and capacity to actively engage in the recovery process

# SUMMARY

- ★ Depression and PTSD are common and unseen complications
- ★ During the post-operative period, orthopedic surgeon often **only** physician patients visit
- ★ The orthopedic surgeon needs to be able to identify PTSD and depression early in the postoperative process
  - ▲ Acknowledge to patient that this is normal
  - ▲ **Refer patient to PCP, counselor or psychiatrist**