

Pain in Combat Veterans Returning from the Wars in Iraq and Afghanistan

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Course Objectives

- Relate the prevalence of chronic pain among returning veterans
- Review the co morbidities associated with chronic pain in this population
- Discuss better insight into the relation of pain mechanisms and pain experience.
- Assess the obstacles and current treatment options within the VA for the treatment of chronic pain.

Introduction



National Demographics

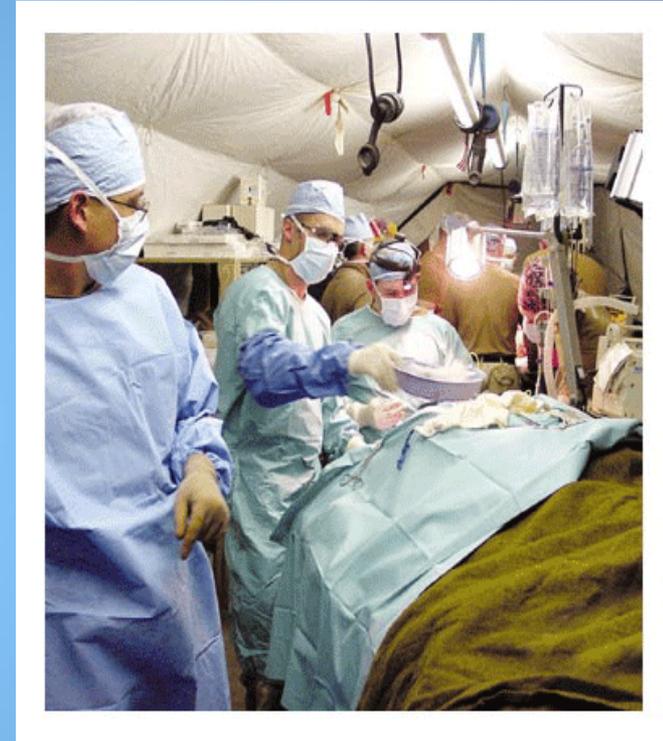
- Over 2.2 million U.S. Forces have deployed to Iraq and Afghanistan
 - 49% Former Active Duty (85% male; 15% female)
 - 51% Reserve and National Guard (82% male; 18% female)
- 52% are between 18 and 24 years
- 24% between 25 and 30 years
- 51% of military members are married and 45% have children
- Up to 75% of the fighting force have been deployed more than once

Overall Prevalence: Magnitude of the Challenge of Treating Persistent Pain in the VA System

- By 2008, there were over 23 million veterans and 5.8 million receiving treatment in the VA Health System
- Of those receiving primary care in VA, 50% of males and 75% of females report pain symptoms
- Of returning OEF/OIF veterans, musculoskeletal conditions are the single most prevalent medical condition of all medical and psychiatric conditions
- Rates of pain even higher among this population who have experienced injury to more than one body part/organ system (eg, polytrauma)

Increased Prevalence of Among Pain Among OEF/OIF Veterans

- As a result of improvements in battlefield medicine 90% of severely wounded soldiers survive and face additional challenges imposed by significant **PAIN**.
- **Chronic pain** increases the risk of mental health disorders including substance abuse disorders.



Polytrauma and Combat

- 65% of combat injuries due to Improvised Explosive Devices (IEDs)
- 60% have history for TBI
- Many veterans require surgery, associated with persistent pain
- Polytrauma associated with significant emotional distress
- 96% of polytrauma veterans report pain during rehabilitation



Prevalence of Pain among OEF/OIF Veterans

- Studies estimate the prevalence of pain between 42%-81%
- Among more severely injured, pain identified in 90% of inpatient injured veterans
- Blast injuries estimated to cause persistent pain in 88% of injured veterans
- 95% of veterans with mTBI report pain while only 22% of those with moderate or severe TBI do so; 30-90% of mTBI report head pain compared to 33% for more severe TBI

Prevalence of Pain among OEF/OIF Veterans (Gironda et al. 2006)

- 47% reported some level of pain
- 28% reported moderate to severe pain
- Musculoskeletal and joint pain recorded for 82% with chronic conditions
- 36% of chronic conditions identified with single injury
- If blast-related injury, more diffuse physical injuries, higher use of analgesics, less benefit from rehab, higher rate of PTSD and psychiatric diagnoses

Prevalence of Pain among OEF/OIF Veterans: Site of Pain

- Lew et al. (2009) reported that back (58%) and head (55%) pain had highest prevalence among convenience sample of OEF/OIF veterans
- Gironda et al. (2006) reported distribution of pain as follows: back (46%), lower limbs (31%), upper limbs (7.5%), neck (6%), abdomen

Chronic Widespread Pain (CWP) among OEF/OIF Veterans (Helmer et al. 2009)

- 29% reported CWP
- 53% screened positive for PTSD
- 60% screened positive for depression
- 60% screened positive for problem alcohol use
- CWP associated with PTSD, depression but not ETOH use
- CWP associated with greater functional disability

Comparative Pain Experience for Male and Female Veterans of OEF/OIF

- Haskell et al. 2009 assessed > 150,000 returning veterans (male =134,731 and female =18,481) between Oct 2001-Nov 2007 for pain problems 1 yr after deployment
- 43% reported pain of any kind of whom 63% reported moderate to severe pain
- 20% reported chronic pain
- Regarding sex differences, females were less likely to report any pain but if they did they were more likely to report moderate-to-severe pain

Common Combat Trauma Pain Factors

Mechanism of trauma

- Blast
- Blunt
- Burn
- penetrating

Common Combat Trauma Pain Factors

- Injury Type: soft-tissue (nociceptive)

wounds

strains/sprains

myofascial pain

joint subluxation/dislocation

skin breakdown

incisional pain

fractures

systemic infection

cervicogenic/tension headache

stump pain

burns

Common Combat Trauma Factors

- Injury type: nervous system (neuropathic)

head injury

spinal cord injury

spasticity

contractures

headaches

peripheral nerve injury

plexus injury

complex regional pain (RSD)

central pain

phantom pain

neuromas

Comorbidity with Chronic Pain among OEF/OIF Combat Veterans

- Veterans at war experience both physical and psychological traumas that can contribute to multiple comorbidities
- Examples include head injury and post-concussive symptoms, psychological trauma and PTSD/mood disorders, substance use disorders to manage emotional distress, sexual trauma, sleep disturbance, physical injuries that lead to persistent pain
- Lew et al. (2009) reported that of convenience sample of 340 veterans, prevalence of chronic pain (82%), PTSD (68%) and TBI (67%) high; only 12 veterans (3.5%) had none of these disorders; 42% shared diagnoses of a painful medical condition, persistent post-concussive symptoms, and PTSD which they termed “polytrauma clinical triad”

Comorbidities Associated with Pain among OEF/OIF Veterans: PTSD

- Lifetime prevalence rates for PTSD among the general population is 8% for general population including 6% for males and 12% for females (Kessler et al. 1995)
- PTSD estimated to be about 18-30% among Vietnam veterans (Kulka, 1998)
- Lew et al. (2009) found that 59% of OEF/OIF veterans in primary care reported comorbid chronic pain and PTSD

Comorbidities Associated with Pain among OEF/OIF Veterans: PTSD

- Mori et al. (1999) assessed prevalence of and relation between PTSD and CP in primary care clinics at Boston VAH (n=219)

n=117 with CP

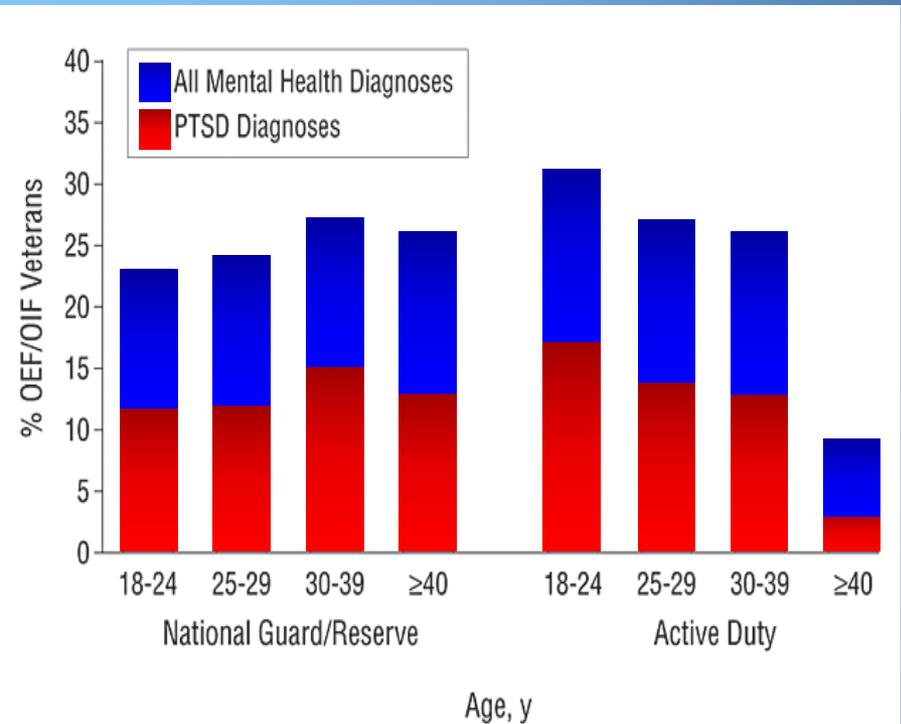
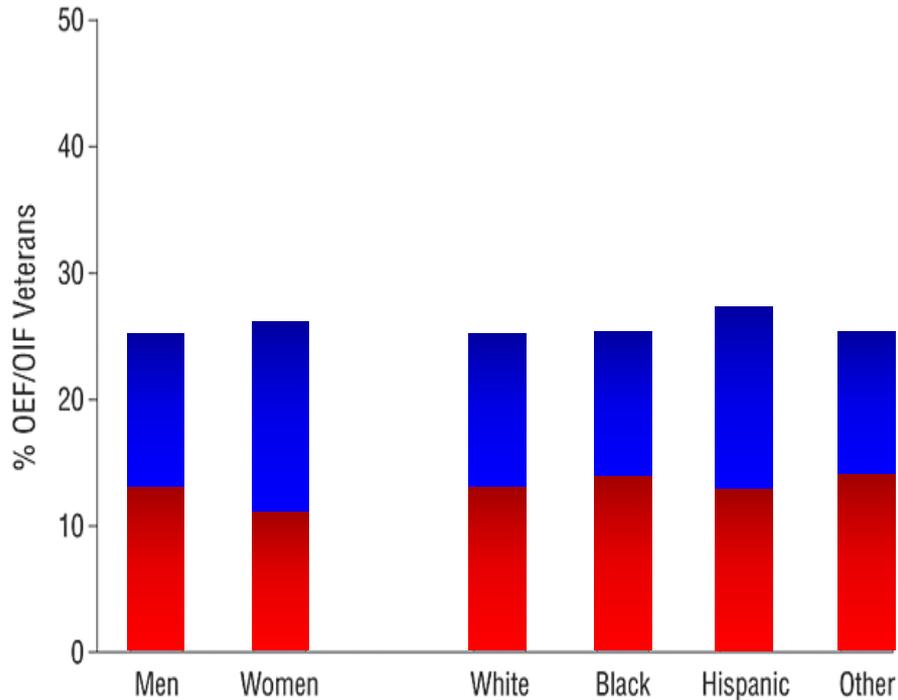
of CPP, 31% diagnosed with PTSD

among non-CP pts, 6% suffered with PTSD

Also comorbid with CP or non-CP groups

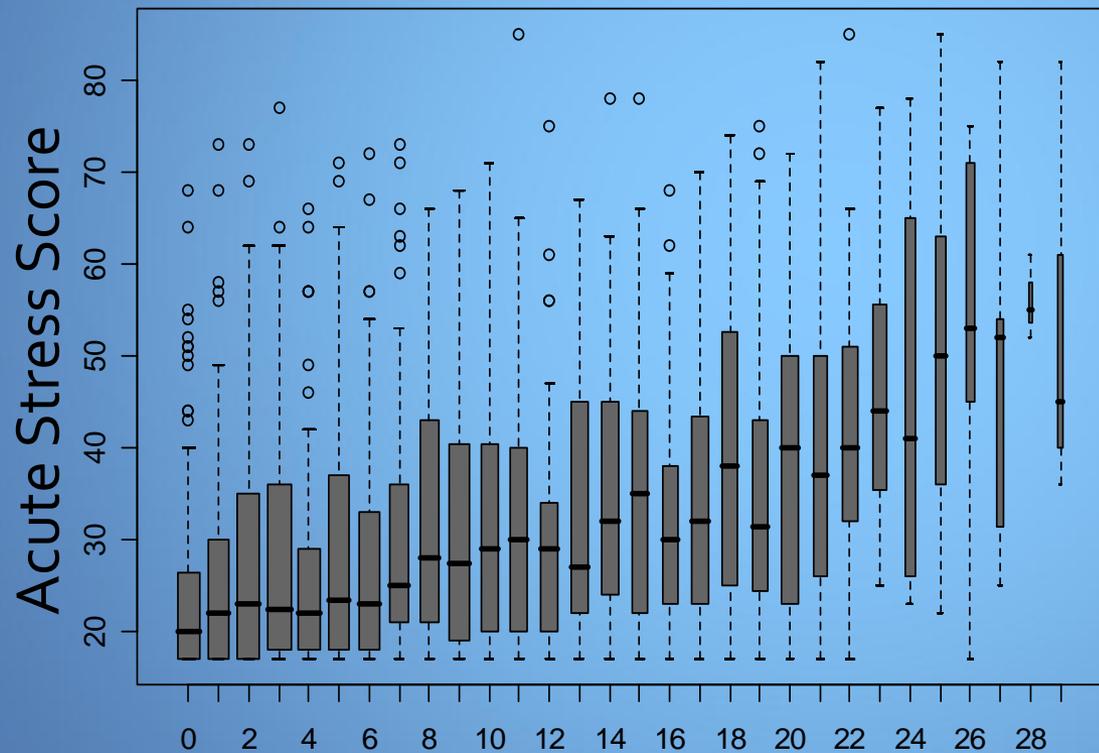
depression (36% vs 9%), anxiety (46% vs 8%) and alcohol abuse (32% vs 23%)

PTSD and Mental Health Diagnoses Among OEF/OIF Veterans Seen at VA Facilities



Combat Exposure Is the Key Driver of Mental Health Problems Across Outcomes

Soldiers who report high levels of combat are significantly more likely to screen positive for acute stress (PTSD symptoms)

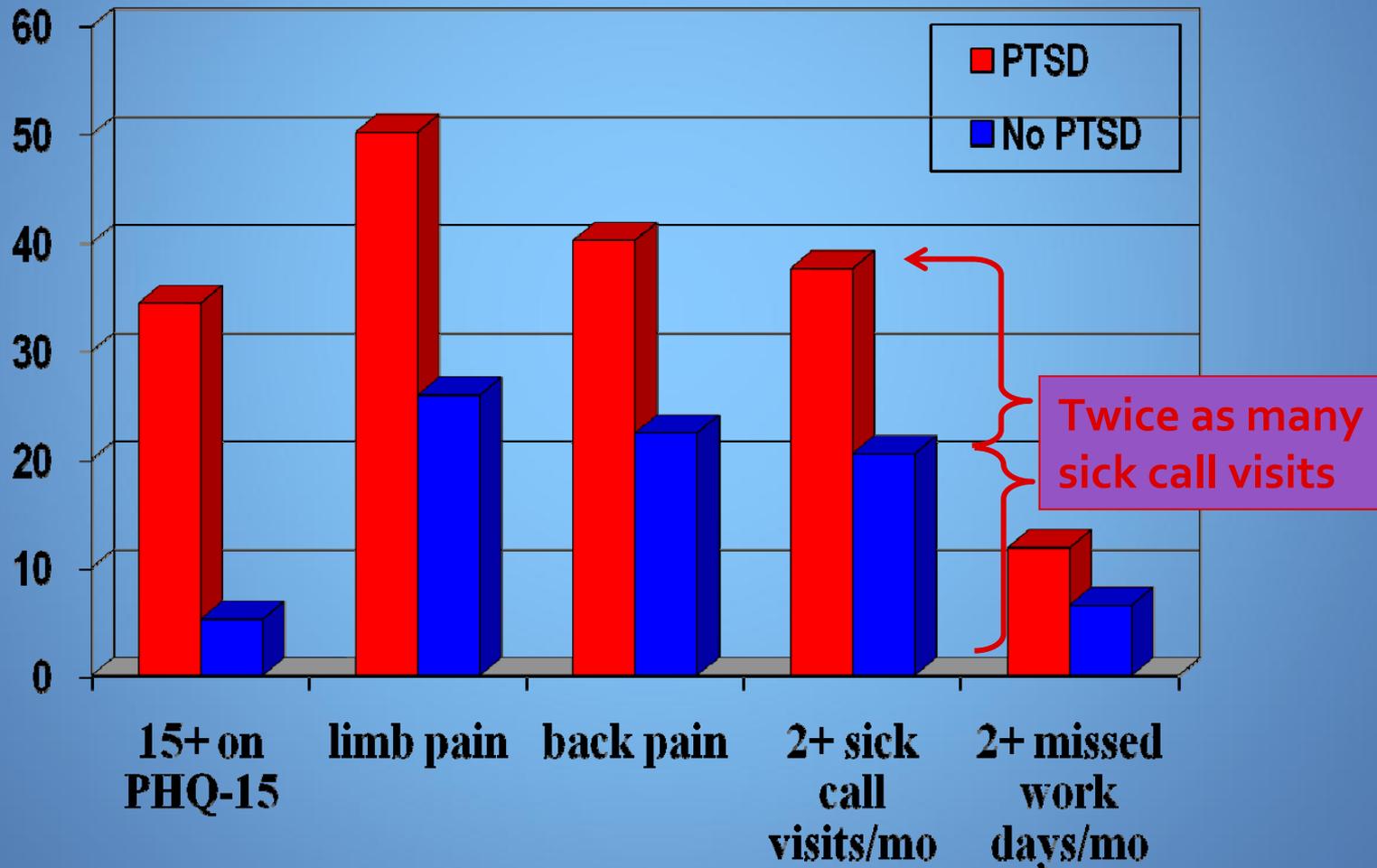


Number of Combat Experiences



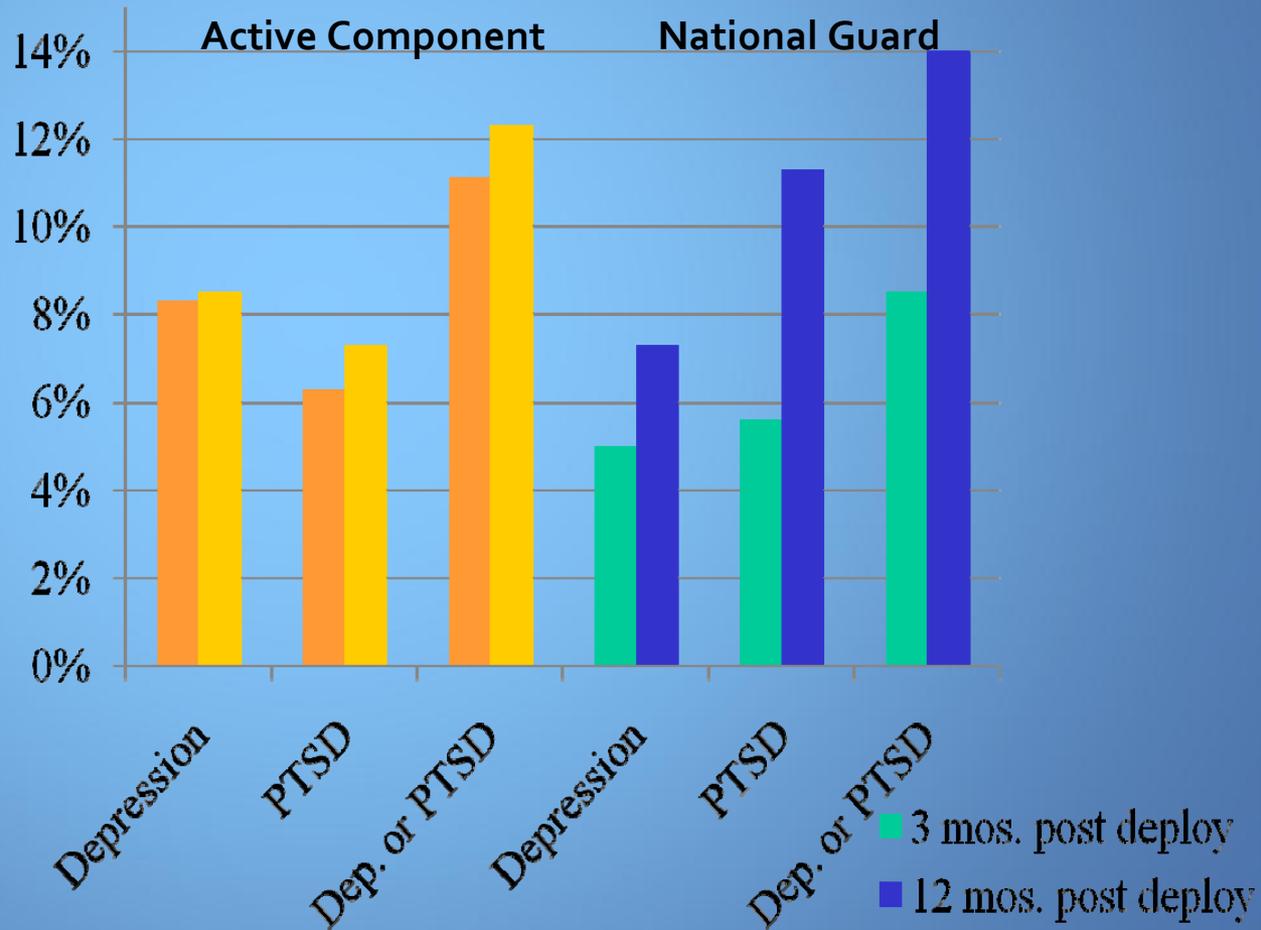
Post-Deployment Health Consequences

2,863 Iraq War returnees one-year post-deployment



PTSD or Depression with Serious Functional Impairment in Active Component and National Guard 3 and 12 Months Post Deployment

Comorbidity common: *Around 50% of those with Depression or PTSD also had alcohol misuse or aggressive behaviors.*



Obstacles In the Treatment of Pain that is Comorbid with PTSD/Depression

- Many veterans resist mental health treatment due to stigma, fear of influence on future employability
- Treatment of PTSD is very difficult and lengthy
- Establishing a trusting relationship with a therapist can be daunting for the veteran
- Symptoms of PTSD (panic, agoraphobia, avoidance of public settings) contribute to disability that is often construed to be related to pain
- Psychophysiologic reactions in PTSD enhance muscle tension and pain
- Both PTSD and depression enhance pain experience

Prevalence of TBI among OEF/OIF Combat Veterans

- Defense and Veterans Brain Injury Center estimates that 10-20% of all OEF/OIF veterans have sustained a TBI; 22% of wounded processed through Landstuhl Med Ctr in Germany had injuries to head, neck or face
- At one center, 88% of injured veterans had sustained an IED blast as cause of injuries; 47% involved injury to head; vast majority (eg > 80%) return to duty within 3 days
- These data raise concern for increased incidence of post-concussive, migraine and cervicogenic headache

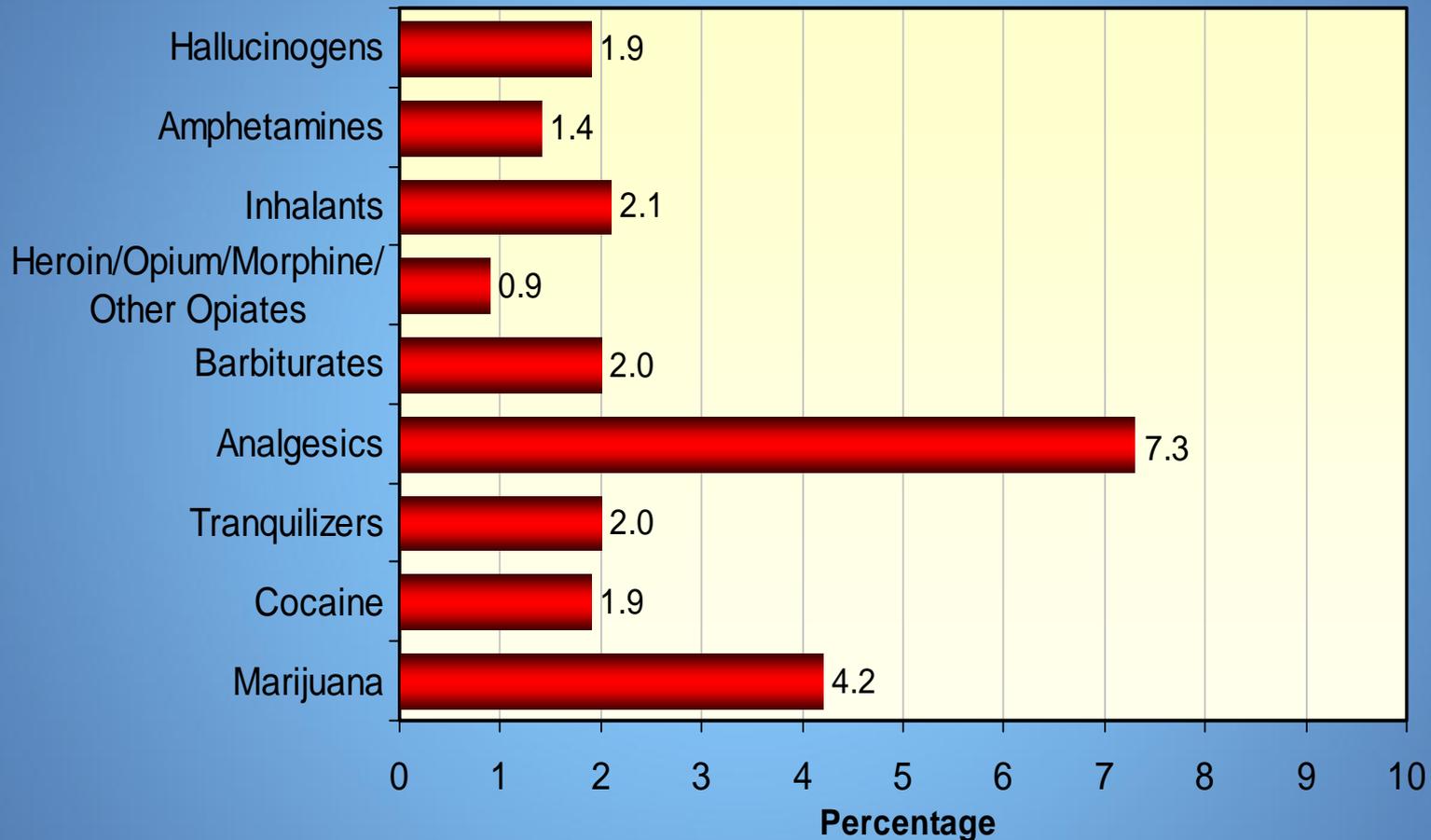
Pain Correlates among Veterans with Combat-Related TBI: Empirical Findings

- Among veterans with a history of TBI veterans, 58% have headache
- Association of head pain and TBI persists after controlling for PTSD
- 52% of TBI c/o other (non-head) persistent pain compared to 32% among non-TBI veterans
- mTBI vets do not share these associations

Obstacles in the Treatment of Pain When Associated with TBI

- Post-concussive headaches can be a challenging pain disorder
- Chronic head pain can be devastating for improving function
- Pain treatment often involves considerable education which can be difficult in a cognitively-impaired veteran

DoD Illicit Drug Use for Selected Drugs Past 12 Months, 2005*

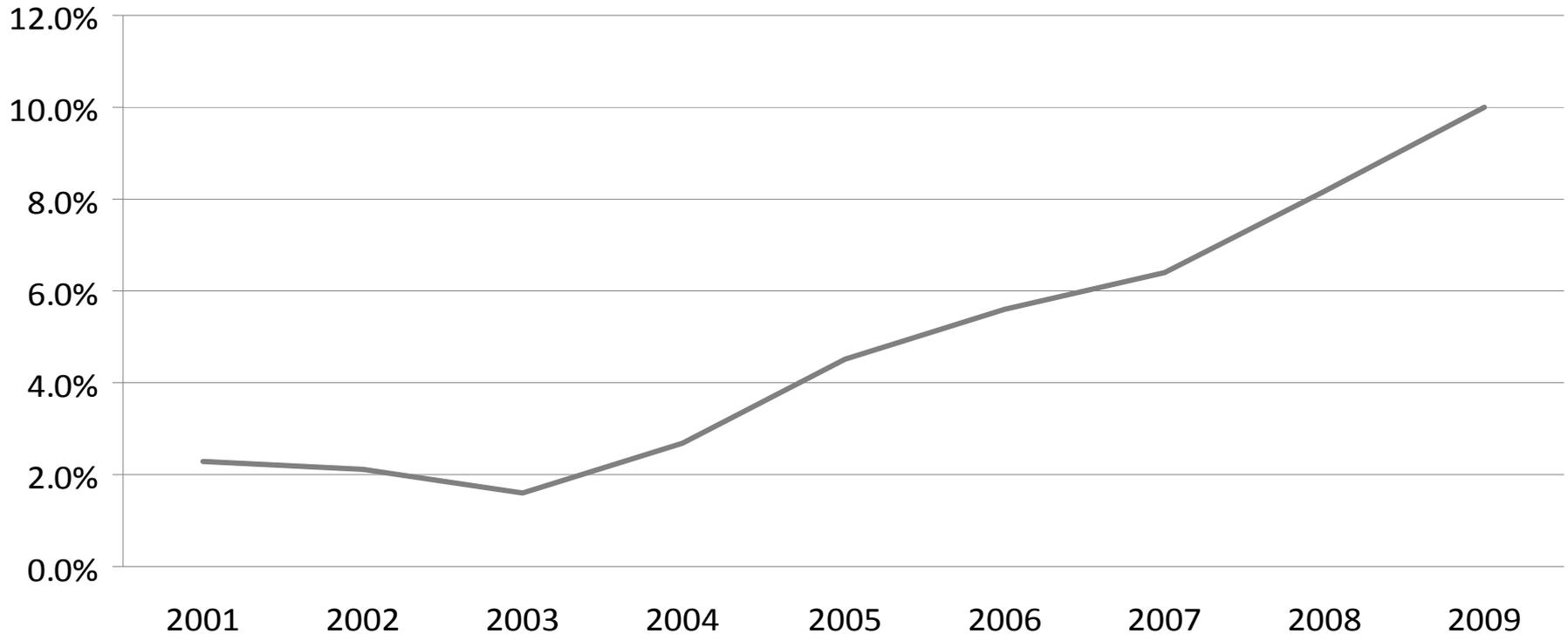


Note: 97% (total DoD) reported being tested for drug use in past 12 months.

*Not comparable with estimates in prior survey years due to questionnaire changes--specific drug examples were added in 2005. Any Illicit drug use = Use of any drug asked about one or more times in the past 12 months for non-medical purposes (overall rate for any drug use = 10.9%, excluding steroids).

SUD and OEF/OIF Veterans

Percent of OEF/OIF Veterans with Diagnoses of Substance Use Disorder by Year Seen



Pain and Substance Use

- In 2009 in VA system, nearly 3.8 million prescriptions were written for pain medications, up from 866,773 such prescriptions in 2001
- Abuse of prescription drugs by the military is more than twice that seen in the civilian population - 5% compared to 11%, according to a 2008 military survey measured against a 2007 civilian survey
 - OxyContin and Vicodin most abused painkillers
 - Out of nearly 30,000 troops, 1 in 4 admitted abusing prescription drugs, most being pain relievers, in a 1 year period

Alcohol Use in Military Personnel

- Excessive **alcohol drinking** and related harms are common among military personnel.
- 43.2% of active duty military personnel reported at least one episode of binge drinking in the past month vs 26.1% for comparable age civilians (*Stahre et al., Am J Preventive Medicine 2008*).



Military Deployment and SUD

- Rate of alcohol behavioral problems double (25% vs 12%) from before to after deployment (Wilk et al, 2010)
- Among Reserve Component personnel there were twice as many *new onsets* of heavy weekly drinking, binge drinking, and alcohol-related behavioral problems among deployed personnel than among their non-deployed peers (Jacobson et al, 2008).
- Post deployment military personnel with SUD problems are rarely referred for care (134 referrals/6669 positive alcohol screens on PDHRA for active duty and 179/4787 for reserve component) (Milliken et al, 2007)

Combat Exposure and SUD

- Combat exposure is associated with increased rates of weekly heavy drinking, binge drinking, and alcohol-related problems. This is particularly true for personnel aged 24 or younger (Jacobson, et al, 2008).
- The threat of death or personal injury is most associated with post-deployment alcohol problems. This relationship is independent of the relationship of these threats to other mental health problems (Wilk et al, 2010)

Obstacles in the Treatment of Pain When a Substance Use Disorder is Present

- Persons with SUD typically have devalued pain tolerance
- Analgesics are powerful anti-depressants and anti-anxiety agents- what are you treating when analgesics are prescribed for a patient with comorbid pain and SUD?
- Most clinicians resist prescribing opioids for the SUD patient, but what if there are no other adequate pain therapies in the presence of a genuine and severe pain disorder?
- Many patients refuse to acknowledge their SUD, and focus on their pain as justification for continued substance use
- SUD typically are comorbid with severe psychopathology

Effect of Polytrauma Clinical Triad on Sleep among OEF/OIF Veterans

- Lew et al. (2010) examined role of polytrauma (pain, mostly mTBI and PTSD) on sleep problems
- In convenience sample of 200 , 94% reported sleep disturbance
- Regression analysis revealed PTSD, pain and interactions of TBI/PTSD and PTSD/pain significantly explained sleep disturbance; presence of PTSD with mTBI or pain increased sleep disturbance severity
- mTBI alone did not influence sleep

Military Sexual Trauma (MST) and OEF/OIF Veterans

- Kimerling et al. (2011) reported that among 125,000 OEF/OIF veterans in VA system, 15% of women and .7% of men report history of MST
- MST associated with mental health diagnosis including PTSD, anxiety, depression, substance use disorders

Pain and Military Sexual Trauma

- There is longstanding interest in the relation of sexual trauma and chronic pain
- Numerous studies find a significant relation between a history of sexual victimization among women and the presence of chronic pain, although some studies find no differences
- Sexual trauma may be a marker for depression and PTSD among this population, and account for some of the relation between a history of sexual abuse and pain
- Among female veterans, sexual harassment (55-79%) and sexual assault (11-48%) are highly prevalent

Pain and Military Sexual Trauma

- Haskell et al. (2008) found a prevalence of chronic pain among female veterans to be 78%
- Persistent pain was found to be related to depression severity, history of both military sexual harassment and forced sex
- However, logistic regression analysis did not find an independent relation of sexual trauma history and presence of pain, but for those with pain sexual trauma history was associated with more severe pain and greater pain-related disability

The Old View of Pain Pathways



FIGURE 30. René Descartes (1596–1650). Illustration from *De l'homme* (1664).

Components of Pain Experience (Gate Control Theory of Pain 1965)

Sensory-discriminative →

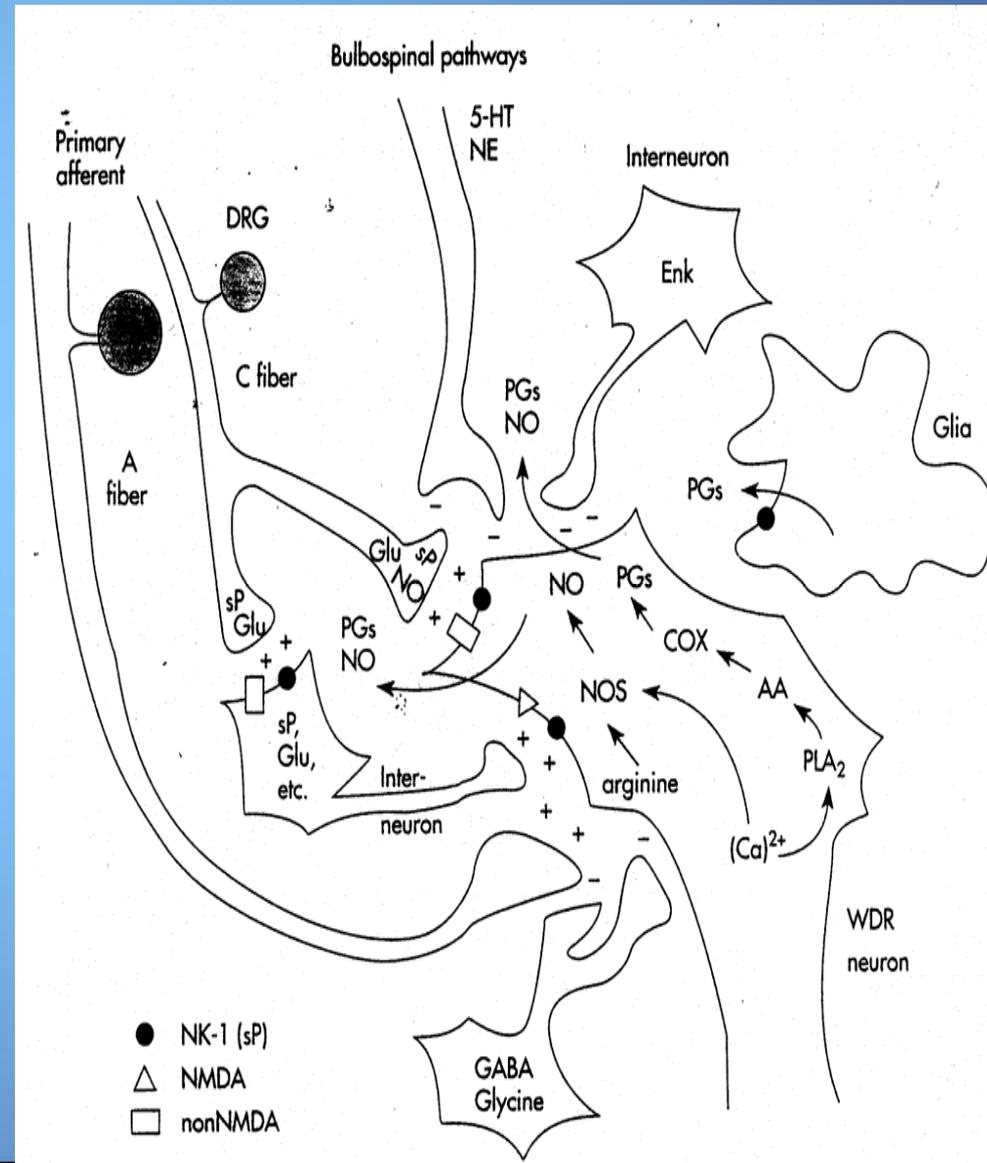
Affective-motivational →

Cognitive-evaluative →

**PAIN
EXPERIENCE**

Synapse of Sensory Afferents in the Spinal Cord: Central Sensitization

Dorsal horn of SC is site of dynamic effect of pain (plasticity) on the CNS in form of *sensitization* (reduced threshold firing) and *wind-up* (enhanced neural firing from constant nociceptive stimulus), both of which enhance pain perception at the central level and explain pain in the absence of tissue damage



Ascending and Descending Pain Pathways

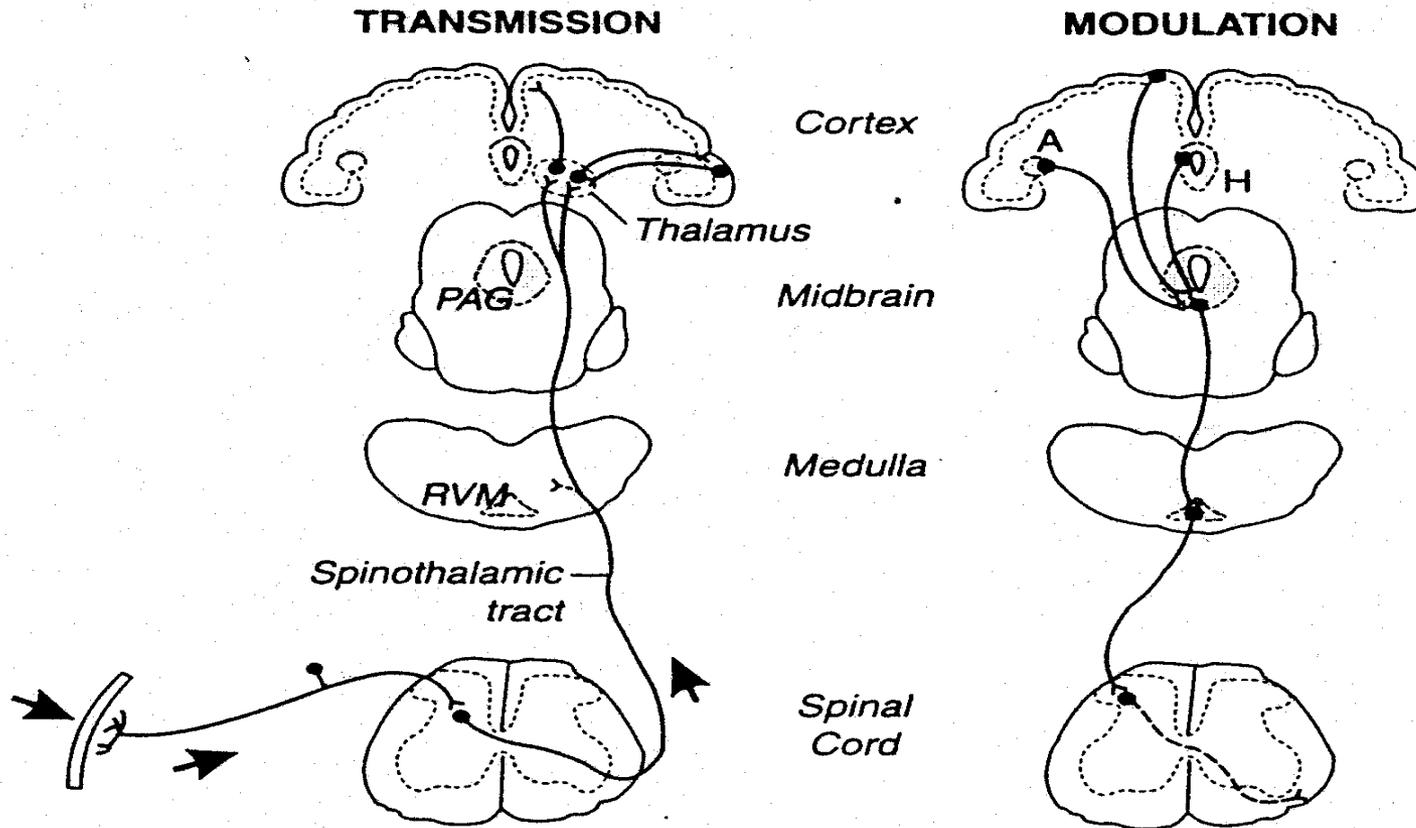
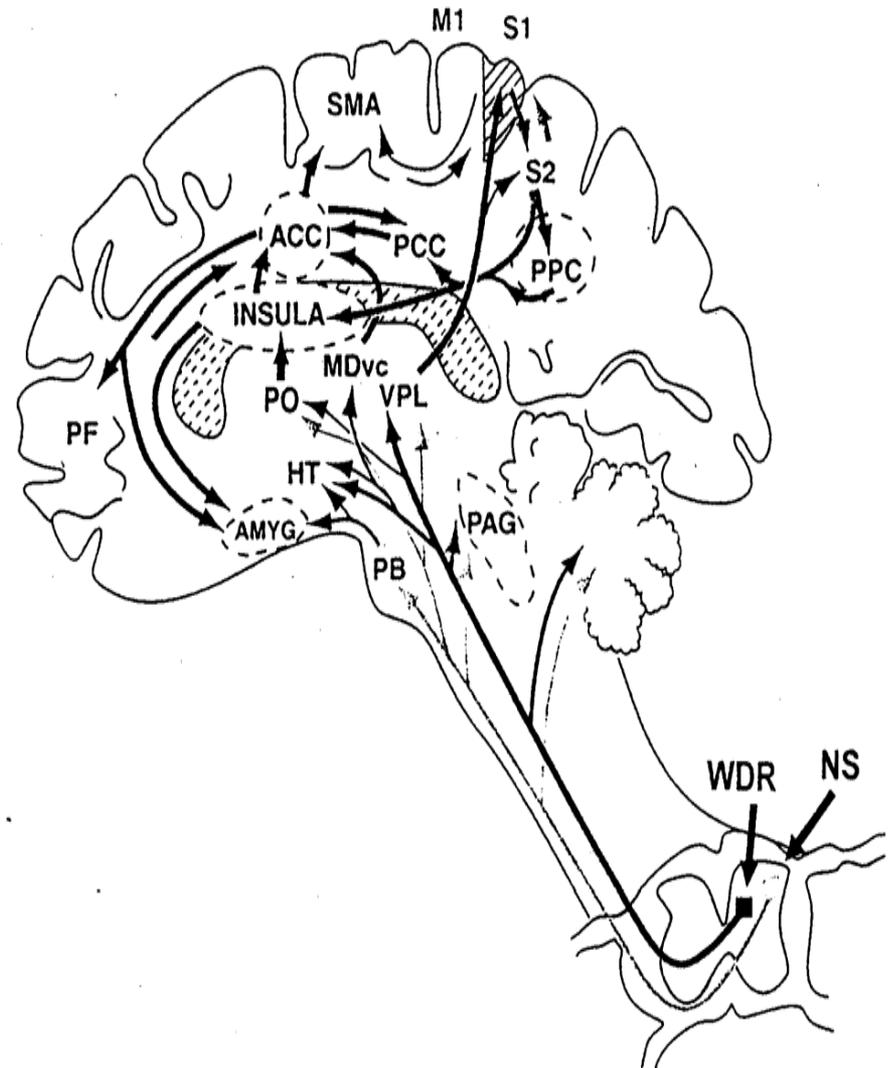


Fig. 1. Transmission and modulation of pain transmission pathways. Note that the origin of pain-modulatory pathways includes the cerebral cortex, hypothalamus, amygdala, periaqueductal gray (PAG), and rostroventral medulla (RVM). Many of these structures are also central targets of ascending nociceptive pathways discussed in Chapter 5. From Fields and Price (1997), with permission from Harvard University Press.

Brain Pain Pathways (Ascending) and Processing

- Ascending pain signals synapse with or activate numerous brain structures in a circulating, reverberatory system
- Several of these centers (PF, ACC, Insula, HT, AMYG) known to involve psychological functioning



“Pain Matrix”: Pain is Processed in at Least Three Domains in CNS

- Sensory: where it is and how much it hurts
 - Primary and secondary somatosensory cortices
 - Thalamus
 - Posterior insula
- Affective: emotional valence of pain
 - Anterior cingulate and prefrontal cortex
 - Anterior insula
 - Amygdala
- Cognitive: “meaning” of pain and sites similar to affective plus prefrontal regions

THE BRAIN (SELF)
CONSTRUCTS PAIN
EXPERIENCE

Interventions for Chronic Pain in Combat Veterans: The Biopsychosocial Model

- Chronic pain is now viewed as the result of biological, psychological and social determinants
- Evidence suggests that integrated and multidisciplinary treatment (medication management, physical therapy, occupational therapy, psychological therapy) provides optimal efficacy; few programs available in VA system
- Chronic pain is best managed by the patient, not the practitioner
- Serious limitations in logistics, resources and the complexity of polytrauma (both physical and psychological) hamper optimal care for the veteran

Interventions for Chronic Pain in Combat Veterans: Physical and Occupational Therapy

- Most spinal pain is musculoskeletal (myofascial)
- Therapeutic exercise, including manual therapies, is the central strategy for pain control
- Physical therapy regimens for back pain are frequently misdirected or inadequate
- Self-management is superior to practitioner management for chronic spinal pain
- Patients must adhere to moderate levels of activity to avoid pain flares
- Skilled PT and OT resources for chronic pain are limited throughout the VA system

Interventions for Chronic Pain in Combat Veterans: Interventional Pain Medicine

- Not widely available throughout VA system
- Are frequently overprescribed for a number of reasons
- Can unrealistically raise hopes of cure
- Reinforce a passive role for the patient and a fixation on pain etiology that suggests severe structural damage
- Are often short-term in their benefit

Interventions for Chronic Pain in Combat Veterans: Medication Management

- Pain patients with PTSD report higher use of opioids than pain patients without PTSD
- PTSD associated with illicit drug use and misuse of prescribed medications
- Pain patients with PTSD at higher risk for developing substance disorders
- Opioids influence mood as well as pain
- Opioid therapy is at times the only available pain therapy due to limited allied health resources
- Use of adjuvant analgesics (antidepressant and anticonvulsant) complicated by formulary policy and treatment of comorbid psychiatric problems

Interventions for Chronic Pain in Combat Veterans: Psychological Therapy

- Relaxation therapies to reduce sympathetic arousal
- Cognitive-behavioral therapy to reduce maladaptive self-talk regarding pain control
- Exposure therapy for treating acquired fears, panic, PTSD
- Address maladaptive pain beliefs and coping (eg, pain catastrophizing, pain-related fear of movement)
- Encourage acceptance of pain and participation in valued activities
- Work with families to encourage health behaviors and self-management

In Conclusion

- Persistent pain is the most common medical disorder for veterans returning from Iraq and Afghanistan
- The high prevalence of polytrauma, medical/psychiatric comorbidities, and wide geographic distribution combine to seriously hamper the direct and effective treatment of chronic pain in this population
- New findings in basic mechanisms of pain experience reveal the integrated nature of psychological functioning and pain experience, seemingly subsumed by the same neurobiologic systems and emphasizing central mechanisms of pain processing
- Expansion of multidisciplinary pain programs are needed to meet the multifactorial problems of this population