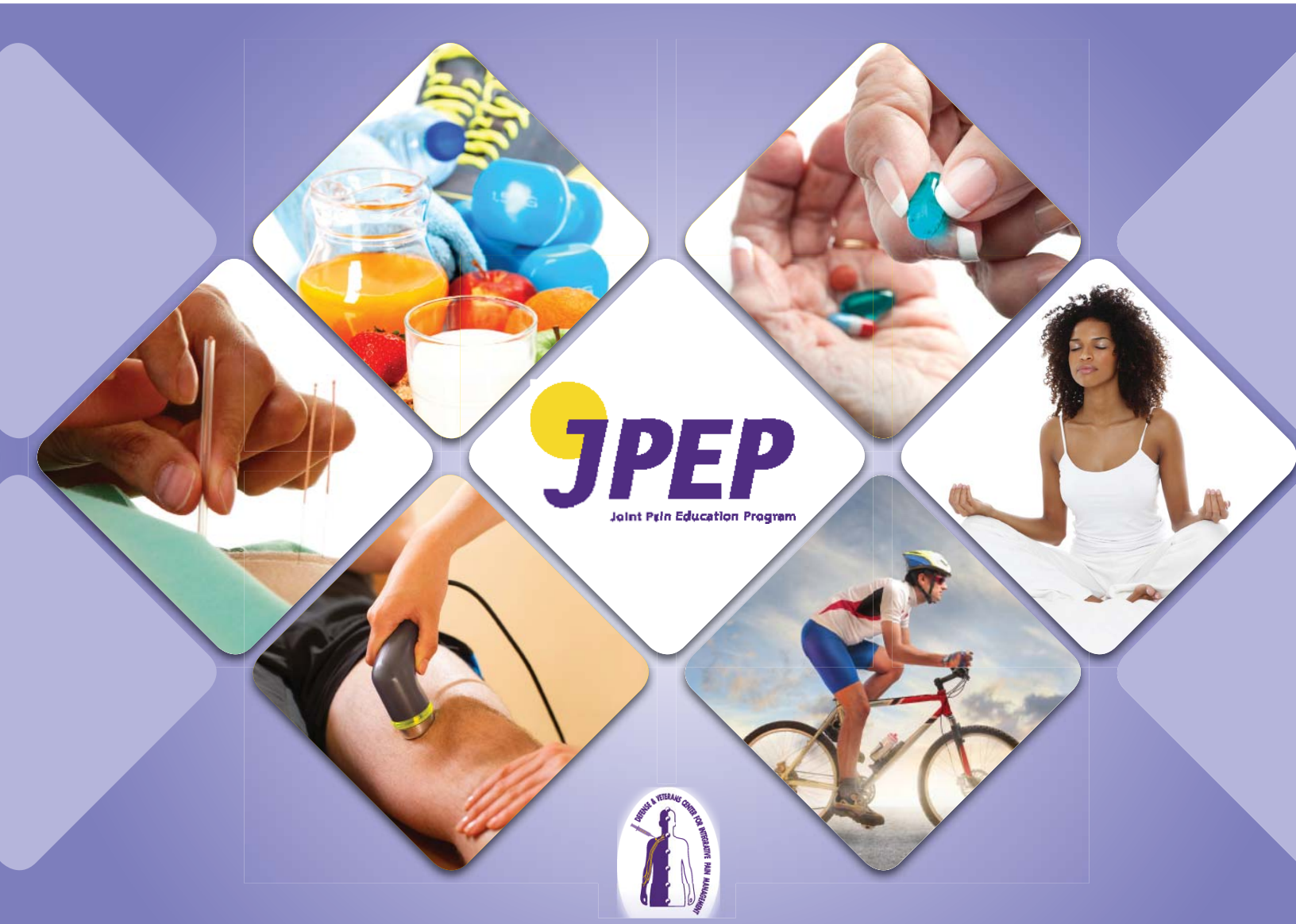
Pain Management for Primary Care

DoD/VHA
JOINT INCENTIVE FUND (JIF)
PROJECT



Series: Two
Introduction to Pain Care

Module 2-1
Modern Understanding of Pain

Module 2-1

Modern Understanding of Pain

By the end of the module, you will be able to:

- Recognize the prevalence of pain and its impact on individuals and society
- Discuss the historical context of the current cultural transformation in pain care
- Explain three components of the pain experience: Sensory, Emotion, and Cognitive

We will review:

Topic One: Impact of Pain on Society

Topic Two: Modern Understanding of Pain

Lead Authoring Subject Matter Experts

Veterans Health Administration
Dr. Friedhelm Sandbrink
Dr. Aram Mardian

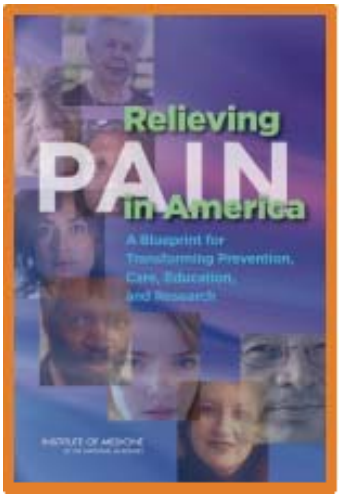
Department of Defense
CDR Steven Hanling, USN
Dr. Diane Flynn

Topic One

Impact of Pain on Society

The 2011 Institute of medicine report says that:

- Chronic pain is the most common and costly chronic illness in the United States
- Over 100 million Americans are burdened with chronic pain
- The cost burden is estimated between $565-635 billion in treatment cost and lost productivity nationwide
- Headache, chronic back pain and other musculoskeletal pain are the main contributors
- Chronic pain is the most common cause of disability, partially or totally disabling 50 million people in the U.S.



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This is important because the cost of pain is more than cardio vascular disease, diabetes, and cancer combined.

Pain is also extremely prevalent among Servicemembers and Veterans.

- 40% of all outpatient visits are related to pain
- Prevalence in Veterans as high as 50% of males and 75% of females
- Pain is among the most frequent complaints of returning Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) soldiers

Notes

The topic of pain is an important one for every healthcare practitioner. Pain is one of the most common reasons people enter the healthcare system. Chronic pain has become a major public health problem in the United States. Untreated and inadequately treated pain causes suffering and financial burden to both patients and society.

As the population ages, the number of people needing treatment for chronic pain will undoubtedly grow from back disorders, Degenerative Joint Disease (DJD), rheumatologic conditions incl. Fibromyalgia, visceral diseases, cancer, effects of cancer treatment, painful neuropathies such as from diabetes and other painful syndromes

- 40% of outpatient visits are related to pain.
- The prevalence of severe, chronic pain is high, affecting nearly one-third of people at least once in their lifetime.
- In veterans, the prevalence is as high as 50% in men and 75% of women (Kerns et al. 2003; Clark 2002) (Haskell et al., 2006)
- Among returning OEF/OIF soldiers, pain is among the most frequent complaint (Clark 2004; Gironda et al. 2006)
- In the US population, chronic pain is the most common cause of disability, and causes partial or total disability of 50 million people

The consequences of mismanaged pain are devastating:

Psychological / Central Nervous System Morbidity	• Fear, anger, suffering • Clinical Depression • Sleep Disorders • Suicide • Loss of self-esteem • Addiction
Medical Comorbidities and Consequences	• Accidents • Neuroplasticity to pain • Medications effects • Immune Function
Quality of Life	• Job performance and workforce readiness • Physical Functioning • Ability to perform activities of daily living (ADL)
Social Consequences	• Marital/family relations • Intimacy/sexual activity • Social role and friendships
Societal Consequences	• Health care costs • Business Failures • Disability • Higher taxes • Lost workdays

Notes

Chronic pain may impact multiple aspects of the lives those who experience it.

- Pain can affect quality of life by reducing physical function, ability to perform activities of daily living, and to work
- Social relationships are often impacted with strain on marital and family relationships, reduced intimacy and sexual activity and loss of social role and friendships
- The societal consequences of chronic pain include increase in healthcare costs, disability, absenteeism, business failures their impact on taxes.
- Psychological conditions associated with chronic pain include: negative emotions such as fear/ anger/ suffering; poor sleep; loss of self esteem; depression; suicide and addiction.
- Adverse medical consequences associated with chronic pain include medication side effects, such as sedation for many agents and associated increase in accidents and falls, decreased immune function observed with high-dose opioids and changes to the central nervous system which can worsen pain.

Social refers to the immediate impact of pain on the immediate support system of the individual.

Societal refers to impact of pain on society at large.

Attitudes towards pain have changed throughout history:

- Before the 20th century
  - Pain was an existential and religious experience and was considered unavoidable. It was a natural part of human life
- During the 20th century
  - Pain became a medical and scientific phenomenon with the promise of "eliminating it" because it was unbearable and avoidable
- In the 21st century
  - The 'over-medicalization' of pain resulted in inadequate solutions to prevent and manage it, at a very high societal cost
  - This called for a cultural transformation, involving a more holistic approach in the way we view and manage chronic pain

Notes

Pain and the goals of pain management have evolved over time. Before the 20th century pain was an existential and religious experience and was considered unavoidable. It was a natural part of human life. During the 20th century pain became a medical and scientific phenomenon with the promise of "eliminating it" because it was unbearable and avoidable. In the 21st century, the 'over-medicalization' of pain resulted in inadequate solutions to prevent and manage it, at a very high societal cost. This called for a cultural transformation, involving a more holistic approach in the way we view and manage chronic pain.

Psychologist JoAnne Dahl describes two Eras in pain management: "Integrated Pain" and "Naked Pain"

- Integrated pain was the first era, prior to the rise of modern biomedicine. Pain was considered an unavoidable and natural part of life.
- Naked pain was the second era, which emerged with the rise of modern biomedicine. Pain was viewed as a medical problem to be solved with a medical solution. Pain was not considered avoidable and unbearable.
- Reintegrated Pain is the third era, which is emerging due to the rise of a cultural transformation in the way chronic pain is viewed and treated.

Attitudes began to change towards pain relief:

- 1980s
  - Interventional pain medicine develops a myriad of percutaneous image-guided procedures and introduces the biomedical management of acute pain into the practice of chronic pain medicine
- 1990s
  - Policies intended to assure compassionate pain care are promoted, including high dose opioid prescription for chronic non malignant pain
  - Sustained release opioids enter aggressively into the market, overestimating the benefits and underestimating the risks of increased prescribing

Notes

U.S. News & World Report. No Excuse for Pain. March 17, 1997

Newsweek. The New War on Pain. June 4th, 2007

The logical consequence of this 2nd era of pain understanding was that the Biomedical Model of pain care expanded and became the dominate paradigm over the past 35 years

- The 1980s was marked by an emphasis on interventional pain management. The biomedical approach was better suited to acute rather than chronic pain
- The 1990s brought the introduction of policies intended to promote compassionate pain care
- A variety of sustained-release opioids were made available with aggressive, often misleading marketing. For example, one letter to the editor of NEJM stated that < 1% of hospitalized patients without prior addiction who received opioids developed addiction.

In the 1990s, much of the burden was placed on the provider to eliminate pain

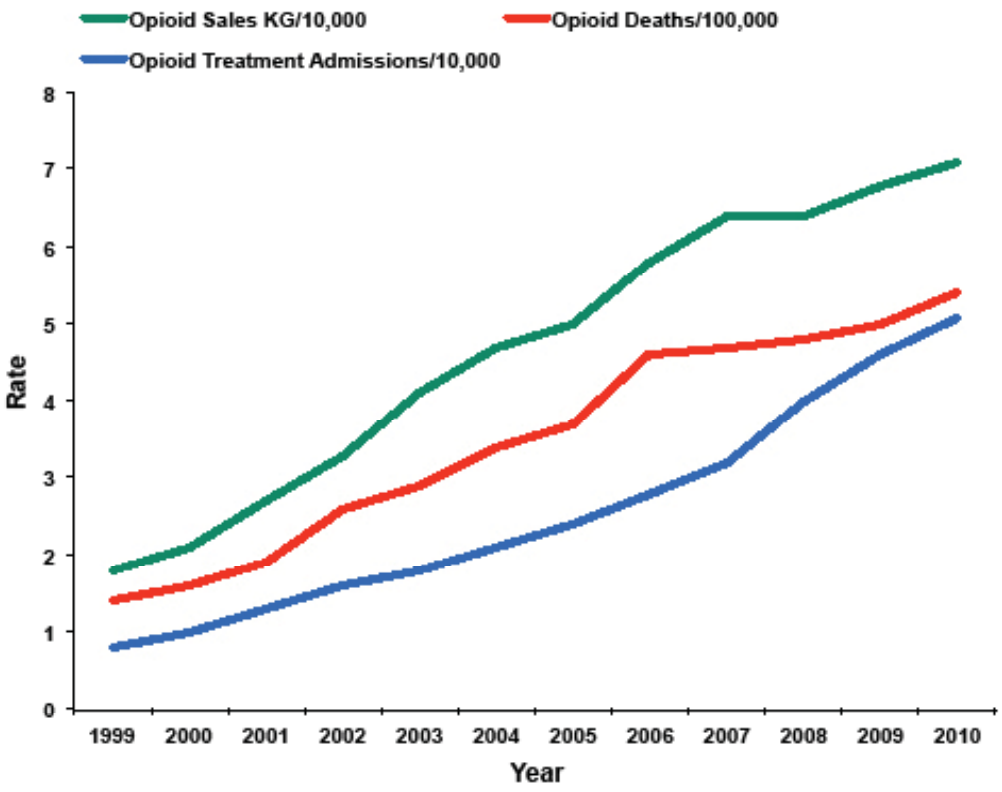
Biomedical Model of pain care expanded and became the dominate paradigm over the past 35 years

It is very important to keep in mind the historical perspective in regards to pain medicine and pain care. A majority of doctors have not practiced before the 2000s.

A figure of < 1% was quoted based on a letter to the editor of the NEJM in 1980 in which the rate of addiction was reported for a group of hospitalized patients without prior addiction/SUD who received opioids during hospitalization

Manchikanti L, Boswell M. Pain physician. 2003;6(4):485–94; Meier B. Painkiller. Barry Meier; 2013; CDC. MMWR. 2013;62(12):217–21.

Overtreatment of pain becomes inappropriate treatment of pain.



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Newsweek. PainKillers. April 9th, 2001.

During the 11-year period starting in 1999, there was a proportional increase in opioid sales, opioid-associated treatment admissions and opioid-related deaths in the US. The increase in opioid prescribing was due to the assumption that chronic non-cancer pain should be treated like cancer pain and aggressive marketing by the pharmaceutical industry, despite LIMITED DATA ON LONG-TERM EFFICACY OR SAFETY.

CDC. MMWR. 2013;62(12):217–21.

CDC, MMWR. 2011;60(43):1491 (updated)

We must refocus on the biopsychosocial model of pain and adopt a more 'holistic' approach in managing it.

- We must balance between managing patients suffering from chronic pain and at the same time reduce morbidity and mortality due to prescription opioid misuse and overdose
- When managing chronic pain we must assure that:
  - self-management/self-care is the foundation of treatment, as we de-medicalize pain
  - functional restoration, not pain relief or elimination per se, is the therapeutic goal
  - we provide a team-based, whole person, multimodal pain care, judiciously prescribing medications and interventions
  - we measure pain, sleep, stress, mood, and function at every clinical encounter. This will allow us to assess the effectiveness of our treatments and create evidence necessary for public policy

Notes

- In recent years, there have been the dual pubic health crises of chronic pain and prescription opioid misuse and overdose
- Fortunately, this is starting to change.
- We are started to refocus on the biopsychosocial model of pain and its management

The 3rd Era of care is the current paradigm. It is characterized by:

- A public health approach including a focus on cultural sensitivity,
- Emphasis on patient self-management and de-emphasis on medical management
- Pain management should involve a team approach which includes multiple treatment modalities which considers the whole person
- Pain management should use a progressively more intensive approach with inclusion of intensive functional restoration programs, when needed.
- Medications and interventions should be used judiciously

"When pain was unavoidable, it was bearable, when pain became avoidable it became unbearable" – JoAnne Dahl, PhD

Knowledge Check

Approximately 50 million people in the US suffer from a disability most commonly due to _____ pain.

a. Somatic
b. Visceral
c. Simple
d. Chronic

Knowledge Check – Answer

Approximately 50 million people in the US suffer from a disability most commonly due to _____ pain.

a. Somatic
b. Visceral
c. Simple
d. Chronic

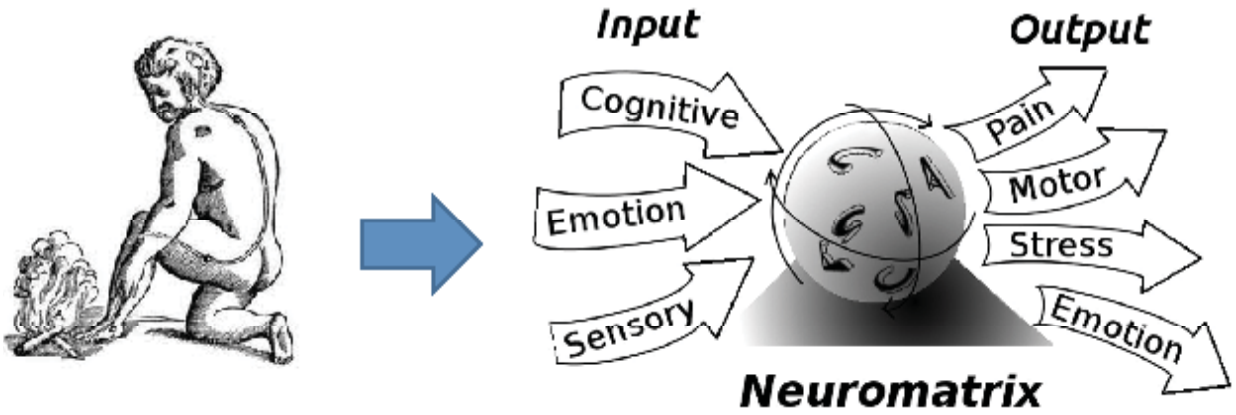
Notes

Read question aloud

Topic Two

Modern Understanding of Pain

Our Understanding of pain has evolved



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The Cartesian model of pain suggests that pain is produced when a cord that originates in the periphery and attaches to a bell in the brain is activated by a painful stimulus. This view persists into the present biomedical view of pain in which the brain is seen as passively receiving noxious stimuli from the body and pain is directly related to the degree of noxious stimulation.

This is contrasted with the modern "Neuromatrix Theory of Pain" in which the conscious experience of pain is seen as one of several outputs of extensive and converging brain networks that are influenced by several inputs (cognitive, sensory, and emotional). The pain experience involves cyclical processing and synthesis of multiple brain networks. Parallel outputs of the pain neuromatrix include motor behaviors, emotional response, and physiologic adaptations intended to maintain homeostatsis.

The modern definition of pain is:

- An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage
- All pain is real
- All pain has three components:
  - Sensory, Emotion, and Cognitive

Pain is a personal and social experience and is different for everyone.

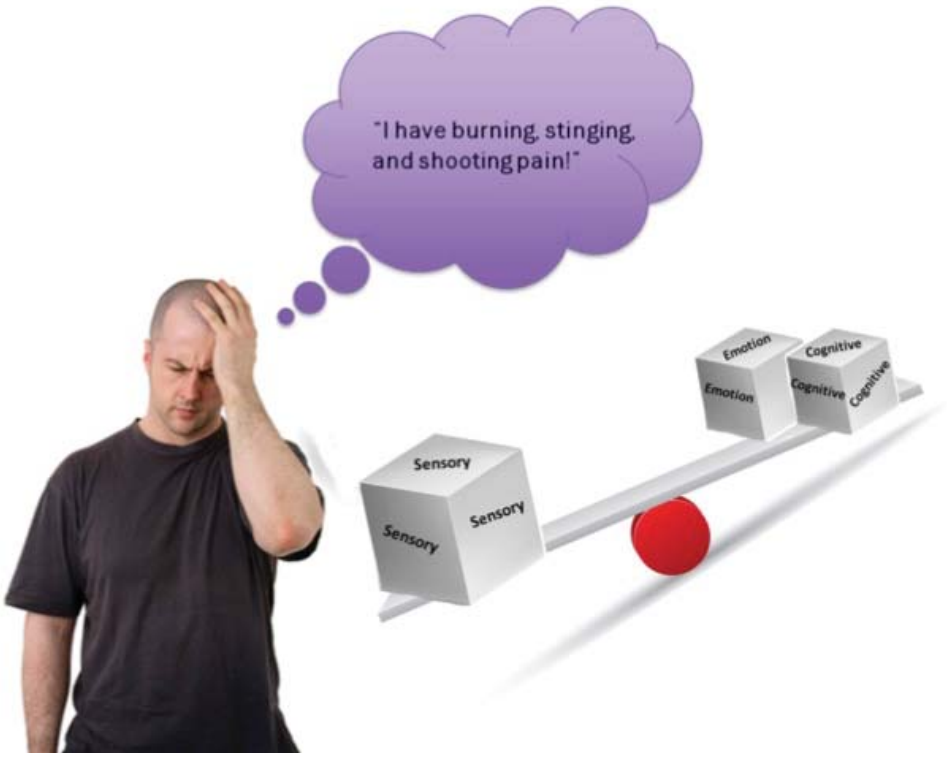
Notes

- Pain has been described by the International Association for the Study of Pain (IASP) as an unpleasant sensory or emotional experience associated with actual or potential tissue damage
- It is the body's alarm signal
- In the 1980s, pain was divided into three broad types: nociceptive (associated with tissue injury), neuropathic (associated with nerve stimulation) and psychogenic (associated with emotional causes), but as pain research advances and pain care shifts from a biomedical to a biopsychosocial model, we recognize that pain is much more complex – all pain involves sensory, emotional and cognitive components.

Regardless of its origin, all pain is real. Pain can be divided into simple and complex

- Simple pain is the most common type of pain and occurs when the nervous system responds appropriately to tissue injury. In simple pain, there are minimal social, psychological and biological complicating factors. People with common pain are typically highly functional. Simple pain responds to appropriate treatments and resolves.
- Complex pain often occurs when the nervous system is sensitized. There are often social, psychological and biological complicating factors. Complex pain persists despite appropriate treatments. Patients often are unable to cope and become overwhelmed. They often have declining function over time despite extensive and potentially expensive and risky medical treatments. Patients with complex pain often present to multiple

In acute pain, the intensity, quality and location of pain are the most important to address.



Notes

- The Sensory/ Discriminative component allows the individual to discriminate the intensity, character, location of the pain
- The Emotional component has an impact on motivation and the individual's behavior
- And the Cognitive component in which the individual evaluates the meaning and impact of pain on the individual's life

Acute Pain is predominantly sensory/discriminative, so it is a bit more clear why acute pain often heals and resolves. This is the type of pain we experience when someone pokes us with a sharp object. The pain alerts us to move away from the source of the injury.

When the other components of pain are present, the pain is more challenging to manage.

Sensory/Discriminative

- Intensity, Quality & Location of Pain

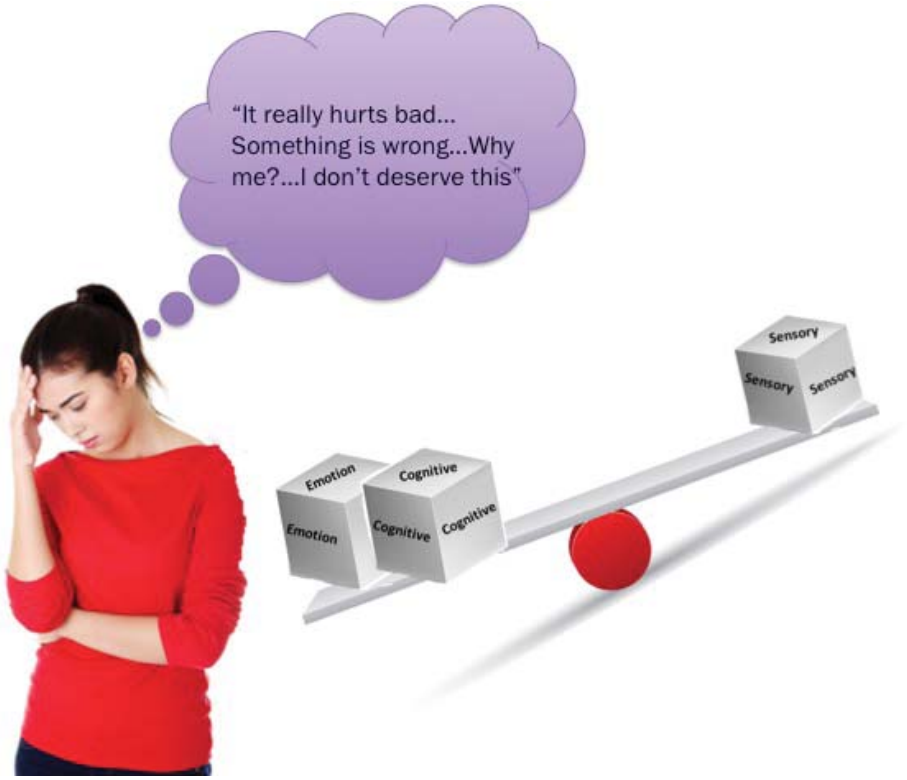
Emotional/Motivational

- How emotional states affect pain experience
- How pain affects behavior

Cognitive/Evaluative

- Thoughts, memories associations related to pain
- Conscious and unconscious meaning of pain

In chronic pain, the fear from pain, hurt and harm are the most important to address.



Notes

This diagram is intended to show that the three components of pain may sometimes all be predominant. The sensory component can be amplified by the other two components and adversely impact functional level.

With chronic pain,

- The Sensory Component effects include an expansion of the receptive field and pain is described in powerful terms, such as "terrible," "crushing", "consuming".
- The Emotional /Motivational Component are characterized by a higher prevalence of decreased mood and proactivity is replaced by dependence and hopelessness. Sleep is often impaired.
- The Cognitive /Evaluative component are characterized by fear of injury and the future. Long-term planning is difficult. Memory and concentration are adversely affected. Education may be hampered. Catastrophic thoughts are common.

It is important to investigate and understand how patients experience pain, not just what they experience.

- The personal 'meaning' of pain is influenced and determined by:
  - Context
  - Mood
  - Prior experiences
  - Expectations (positive or negative)

Notes

Our brain uses complex processing of multiple types of information such as context, prior experience, memory and expectation to create meaning

This process is beyond our conscious awareness , with the aim of promoting survival.

Expectations influence pain intensity and response to treatment.

Negative expectations alter the brain in the regions involved in pain processing, such as insula, cingulate, thalamus.

Chronic pain changes the brain in several locations:

- Chronic pain affects the emotional and threat networks in the cingulate cortex and anterior insula
- The sensory networks in the primary and secondary somatosensory cortices
- The cognitive networks in the prefrontal cortex

These dysfunctional changes appear to be ameliorated by psychological interventions, meditation, physical therapies (such as motor skills training, mirror therapy and yoga), and acupuncture.

The general approach to chronic pain should be:

- To understand the determinants that are perpetuating the painful experience
- To focus on eliminating these determinants, not pain relief
- To identify and facilitate personal valued activities as the goal of treatment

Notes

Therefore, the assessment of pain requires an approach that:

- Considers the determinants of the pain experience
- Focuses on eliminating the determinants and effects of the pain experience
- Addresses the dysfunctional brain changes and central sensitization
- Identifies the activities that are of value to the individual and facilitates return to those activities

Knowledge Check

The most important thing when managing a patient with chronic pain is to recognize that:

a. self-management/self-care is the foundation of treatment

b. measure pain, sleep, stress, mood and function at every clinical encounter and assure that functional restoration, not pain relief is the therapeutic goal

c. provide a team based, whole person, multimodal pain care, judiciously prescribing medications and interventions

d. All of the above

Knowledge Check – Answer

The most important thing when managing a patient with chronic pain is to recognize that:

a. self-management/self-care is the foundation of treatment

b. measure pain, sleep, stress, mood and function at every clinical encounter and assure that functional restoration, not pain relief is the therapeutic goal

c. provide a team based, whole person, multimodal pain care, judiciously prescribing medications and interventions

d. All of the above

Notes

Read question aloud

Summary

Recall that all pain is real and that chronic pain has an enormous impact on individuals, families, and society.

Look for the sensory, emotion and cognitive components of the painful experience and encourage meaningful valued activities for the patient.

Remember that pain is influenced and determined by expectations, context and mood and requires a holistic and team based approach.

Notes

In summary, chronic pain has a major impact on the lives of those who experience it, their families and society. It is the most common and costly chronic condition in the US and is the most common cause of disability.

Current understanding of pain acknowledges the complexity of pain determinants and effects, the brain changes associated with chronic pain, and the impact of chronic pain on interference with valued activities.

An understanding of these biopsychosocial factors is important to helping individuals with pain reverse dysfunctional brain networks and to make progress toward their goals.

References

Atlas, L. Y., & Wager, T. D. (2012). How expectations shape pain.Neuroscience letters, 520(2), 140-148.

Bingel, U., Wanigasekera, V., Wiech, K., Mhuircheartaigh, R. N., Lee, M. C., Ploner, M., & Tracey, I. (2011). The effect of treatment expectation on drug efficacy: imaging the analgesic benefit of the opioid remifentanil. Science translational medicine, 3(70), 70ra14-70ra14.

Malik, R. A., Williamson, S., Abbott, C., Carrington, A. L., Iqbal, J., Schady, W., & Boulton, A. J. (1998). Effect of angiotensin-converting-enzyme (ACE) inhibitor trandolapril on human diabetic neuropathy: randomised double-blind controlled trial. The Lancet, 352(9145), 1978-1981. Butler DS, Moseley GL. Explain Pain. 2013; 2nd ed. Noigroup Publications.

Butler, D. S., & Moseley, G. L. (2013). Explain Pain:(Revised and Updated. Noigroup Publications.

Boudreau, S. A., Farina, D., & Falla, D. (2010). The role of motor learning and neuroplasticity in designing rehabilitation approaches for musculoskeletal pain disorders. Manual therapy, 15(5), 410-414.

Bushnell, M. C., Čeko, M., & Low, L. A. (2013). Cognitive and emotional control of pain and its disruption in chronic pain. Nature Reviews Neuroscience, 14(7), 502-511.

Bushnell, M. C., Case, L. K., Ceko, M., Cotton, V. A., Gracely, J. L., Low, L. A., ... & Villemure, C. (2015). Effect of environment on the long-term consequences of chronic pain. Pain, 156, S42-S49.

Cohen, S. P., & Mao, J. (2014). Neuropathic pain: mechanisms and their clinical implications. Bmj, 348. Darnall B. Less Pain, Fewer Pills: Avoid the Dangers of Prescription Opioids and Gain Control over Chronic Pain. 2014; Bull Publishing Company.

Darnall B. Less Pain, Fewer Pills: Avoid the Dangers of Prescription Opioids and Gain Control over Chronic Pain. 2014; Bull Publishing Company.

Bonica, J. J. (2010). Bonica's management of pain. S. Fishman, J. Ballantyne, & J. P. Rathmell (Eds.). Lippincott Williams & Wilkins.

Flor, H. (2014). Psychological pain interventions and neurophysiology: Implications for a mechanism-based approach. American Psychologist, 188-196.

Frontera, W. R., Silver, J. K., & Rizzo Jr, T. D. ESSENTIALS OF PHYSICAL MEDICINE AND REHABILITATION: MUSCULOSKELETAL DISORDERS, PAIN, AND REHABILITATION.

Gallagher, R. Presentation at OEF/OIF Evolving Paradigms II Conf. VHA Directive: National Pain Management Strategy. 2010

Garland, E. L. (2012). Pain processing in the human nervous system: a selective review of nociceptive and biobehavioral pathways. Primary Care: Clinics in Office Practice, 39(3), 561-571.Levine FM, De Simone LL. The effects of experimenter gender on pain report in male and female subjects. Pain. 1991;44(1):69–72.

Levine, F. M., & De Simone, L. L. (1991). The effects of experimenter gender on pain report in male and female subjects. Pain, 44(1), 69-72.

Melzack R. Evolution of the neuromatrix theory of pain. The Prithvi Raj Lecture: presented at the third World Congress of World Institute of Pain, Barcelona 2004. Pain practice : the official journal of World Institute of Pain. 2005;5(2):85–94.

Moseley, G. L., & Flor, H. (2012). Targeting cortical representations in the treatment of chronic pain a review. Neurorehabilitation and neural repair, 26(6), 646-652.

Napadow, V., Liu, J., Li, M., Kettner, N., Ryan, A., Kwong, K. K., ... & Audette, J. F. (2007). Somatosensory cortical plasticity in carpal tunnel syndrome treated by acupuncture. Human brain mapping, 28(3), 159-171. Poleshuck et al. Int J Methods Psychiatr Res. 2003.

Poleshuck, E. L., Gamble, S. A., Cort, N., Hoffman-King, D., Cerrito, B., Rosario-McCabe, L. A., & Giles, D. E. (2010). Interpersonal psychotherapy for co-occurring depression and chronic pain. Professional Psychology: Research and Practice, 41(4), 312.

Portenoy, R. K., & Kanner, R. (Eds.). (1996). Pain management: theory and practice. FA Davis Company.

Portenoy, R. K. (1989). Mechanisms of clinical pain. Observations and speculations. Neurologic clinics, 7(2), 205-230.

Porter, J., & Jick, H. (1980). Addiction rare in patients treated with narcotics.The New England journal of medicine, 302(2), 123.

Woolf, C. J. (2011). Central sensitization: implications for the diagnosis and treatment of pain. Pain, 152(3), S2-S15.

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