INTEGRATIVE APPROACH TO PAIN MANAGEMENT

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I have no conflict of interest to declare
I will not be discussing any off label use of any products
I will not be mentioning any brand name or commercial drug
Recognize the prevalence, magnitude, challenges and opportunities for multidimensional approach to chronic pain in the US

Describe the science and evidence behind different components of integrative medicine based approach to pain management

Utilize innovative ideas to incorporate integrative approach to pain management
The annual cost of chronic pain in the United States is estimated to be $100 billion (healthcare expenses, lost income, and lost productivity).

Chronic pain is common, exists as the number one cause of disability in the United States, and creates a large burden on the healthcare system.

Back pain is the leading cause of disability in Americans under 45 years old.

More than 26 million Americans between the ages of 20-64 experience frequent back pain.
50 million Americans live with chronic pain
An additional 25 million live with acute pain
Mismanagement of pain has far reaching societal consequences
In fighting illicit misuse, must not hinder patients’ access to beneficial medical treatments
Non-medical use of prescription drugs = 2nd most commonly abused drug category
Prescription drug abuse is 3x more prevalent than illicit use of cocaine, crack, and hallucinogens
This pattern presents both challenges and opportunities in creating integrative approach to pain management
Opioid Prescriptions Dispensed by Retail Pharmacies—United States, 1991–2011

Number of Prescriptions (in millions)

Year


76 78 80 86 91 96 100 109 120 131 139 144 151 158 169 180 192 201 202 210 219

Available at http://www.slideshare.net/OPUNITE/nora-volkow-final-edits.
Primary Substance of Abuse at Treatment Admission—United States, 2000–2010

SAMHSA Treatment Episode Data Set, 2000-2010.
Motor Vehicle Traffic, Poisoning, and Drug Poisoning (Overdose) Death Rates
United States, 1980–2010

Number of Drug Overdose Deaths Involving Opioid Pain Relievers and Other Drugs
United States, 1999–2010

- Any opioid analgesic
- Specified drug(s) other than opioid analgesic
- Only non-specified drug(s)
Drug Overdose Deaths by Major Drug Type, United States, 1999-2010

- Opioids
- Heroin
- Cocaine
- Benzodiazepines


Number of Deaths: 0, 2,000, 4,000, 6,000, 8,000, 10,000, 12,000, 14,000, 16,000, 18,000.
$72.5 billion in health care costs\(^1\)

Opioid abusers generate, on average, annual direct health care costs 8.7 times higher than nonabusers\(^2\)

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Rates of Opioid Overdose Deaths, Sales, and Treatment Admissions, United States, 1999–2010

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm60e1101a1.htm?s_cid=mm60e1101a1_w

Updated with 2009 mortality and 2010 treatment admission data.
Why Integrative approach to pain management is beneficial

Pain often co-exists with mood, sleep, and functional disorders that require additional attention for optimal management:

- **Sleep Disturbance.** 20% of American adults (42 million people) report that pain disrupts their sleep a few nights a week or more.

- **Depression and Anxiety.** Example in facial pain and its relation to anxiety and depression: A cross-sectional study on 649 patients. The analysis showed that, regardless of the diagnostic group, anxiety and depression independently increase the likelihood of having … higher muscle tenderness...

- **Chronic back pain is accompanied by brain atrophy** (1.3 cm³ loss of gray matter/year of pain;)

Chronic back pain is accompanied by brain atrophy (1.3 cm³ loss of gray matter/year of pain; see figure above)

Cortical Plasticity: *Adult brain (is) capable of substantial plastic change in primary somatosensory cortex* ... *formerly thought to be modifiable only during early experience* ...

*Cortical plasticity related to chronic pain can be modified by behavioral interventions that provide feedback to the brain areas that were altered by somatosensory pain memories.*

fMRI biofeedback for control of brain activity in pain patients: “…individuals can gain voluntary control over specific brain region given appropriate training, these effects were powerful enough to impact severe, chronic clinical pain.
1. NIH Consensus Statement:
   a. Strong evidence for the use of relaxation techniques in reducing chronic pain in a variety of medical conditions,
   b. Strong evidence for the use of hypnosis in alleviating pain associated with cancer

2. Mind-body medicine: state of the science, implications for practice.
   “There is considerable evidence of efficacy for several mind-body therapies in the treatment of headaches, insomnia, chronic low back pain, symptoms of cancer, and improving post surgical outcomes.”

3. Examples: Behavioral van Tulder et al.
Pain Management Goals

- Relieve acute and chronic pain
- Employ appropriate pharmacological and nonpharmacological techniques
- Minimize side effects
Chronic pain requires an integrative / holistic approach

Patients find more satisfaction from CAM

- Massage 65%
- Chiropractic 61%
- Relaxation techniques 43%
- Conventional providers 27%

Patients rated CAM as "very helpful" for back / neck pain

Intervention perceived to be most effective for LBP

- Alternative medicine 62.8%
- Therapeutic exercise 56.9%
- Bed rest 51.9%
- Physical therapy 46.8%

The least effective were physicians' office visits. A gap was found between clinical guidelines and physicians referrals for other therapeutic interventions.
Non-opioid Analgesics

- Used for mild to moderate nociceptive pain
- Anti-inflammatory drugs (NSAIDs)
  - Carry risk of gastrointestinal bleeding and impaired renal function
    - Avoid persistent use in older adult population
  - Acetaminophen (Tylenol)
    - Use safe with older adults having normal kidney and liver function and no history of alcohol abuse
    - Dosages not to exceed 4,000 mg/day
Non-opioid Analgesics

- Anti-inflammatory drugs (NSAIDs)
  - Cyclooxygenase-2 (COX-2)
    - Tramadol
      - Used for moderate pain
      - May cause dizziness, nausea, and headache
Pharmacological Management

- Opioid analgesics
  - Used for moderate to severe pain management
  - May be used for long periods of time without risk of organ damage
  - Available in a variety of routes
  - Titrate slowly
  - Mild sedation and cognitive impairment are anticipated in initial therapy
Pharmacological Management

- Opioid analgesics
  - Potential medications
    - Morphine
    - Meperidine
    - Methadone
    - Oxycodine
    - Fentanyl Transdermal
Pharmacological Management

- Opioid analgesics
  - Potential adverse effects
    - Constipation
    - Sedation
    - Respiratory depression
    - Nausea and vomiting
    - Myoclonus
    - Pruritis
Pharmacological Management

- Adjuvant drugs for chronic pain
  - Examples
    - Antidepressants and anticonvulsants
    - Topical analgesics
    - Muscle relaxants
    - Antianxiety medications
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CAM - complementary and alternative medicine

- Specific therapies/modalities
- Not typically taught, used or reimbursed in USA hospitals
- A group of diverse practices not presently considered part of conventional medicine
- 5 domains defined by NIH-NCCAM
  - Mind/Body
  - Biological
  - Manipulative/Body-based
  - Alternative Systems
  - Energetic
Integrative Medicine - A system of care that emphasizes wellness and healing

- **Principles**
  - Mind/body/spirit
  - Patient – provider as collaborative partners
  - Natural, less invasive approaches when possible
  - Facilitating the body’s natural healing capacities
  - Need for provider self-care
  - Conventional and CAM in balance
  - Customized to patient need and preference
  - Balance of evidence and safety considerations
Nonpharmacological Methods to Manage Pain – Based on Mind body interventions

- Psychological approaches
  - Counseling
  - Biofeedback
  - Imagery
  - Hypnnosis
  - Relaxation
Mind-body medicine focuses on the interaction among the mind, thoughts, brain and body. It explores the ways in which emotional, mental and spiritual attitudes can directly alter the status of health.
Research in Mind Body Medicine

- Mind-Body Interventions and healthy outcomes
  - The treatment of disease
  - Decrease pain
  - Helps physicians deal with compassion fatigue
  - Improve mood, QOL, and coping
  - Improve disease or treatment related symptoms
- Mind-Body connection Immunity
  - Positive effects of emotions on immunity
- Meditation and Imaging
  - Use of fMRI to investigate the effects of meditation on the activation of regions of the brain
- Stress and Wound Healing
  - Positive and negative effects of mood or stress on the rate of wound healing
- Surgical Preparation
  - Reduce discomfort and adverse effects
Mind body intervention and changes in Neuro-endocrine-immune axis

Stress

- Endocrine System
- Neuropeptides
- Autonomic Nervous System
- Immune System
- Allergic Reaction
- Inflammation
- Suppressed Immune Response
- Abnormal Cell growth
- Viral Infection
- Bacterial Infection

Meditation

- Endocrine System
- Neuropeptides
- Autonomic Nervous System
- Immune System
- Desired Homeostasis
- Decreased Stress Hormones
- Reduced Tumor Growth Factors
- Regeneration & Renewal
- Healing

- Relaxation
- Enhanced Immune Response
- Reduced Abnormal Cell production
Genomic changes during meditation: Genes can be modified
Genomic changes introduced by relaxation response

http://www.plosone.org/article/info:doi/10.1371/journal.pone.0002576
Spect Images at baseline and meditation

PARIETAL LOBE  FRONTAL LOBE
Behavioral/Systems/Cognitive

Brain Mechanisms Supporting the Modulation of Pain by Mindfulness Meditation

Departments of Neurobiology and Anatomy and Biomedical Engineering, Wake Forest University School of Medicine, Winston-Salem, North Carolina 27157, and Psychology Department, Marquette University, Milwaukee, Wisconsin 53233

The subjective experience of one’s environment is constructed by interactions among sensory, cognitive, and affective processes. For centuries, meditation has been thought to influence such processes by enabling a nonevaluative representation of sensory events. To better understand how meditation influences the sensory experience, we used arterial spin labeling functional magnetic resonance imaging to assess the neural mechanisms by which mindfulness meditation influences pain in healthy human participants. After 4 d of mindfulness meditation training, meditating in the presence of noxious stimulation significantly reduced pain unpleasantness by 57% and pain intensity ratings by 40% when compared to rest. A two-factor repeated-measures ANOVA was used to identify interactions...
Other Nonpharmacological Methods to Manage Chronic Pain

- Physical therapy
  - Ultrasound
  - Exercise
  - Hot and cold packs
- Neurostimulation
Integrative Toolkits for Chronic Pain Management

- Behavioral Therapy
- Herbal therapy
- Biofeedback
- Physical Therapy
- Osteopathic Manipulation
- Craniosacral Therapy
- Acupuncture
- Massage
- Yoga
- Reiki
Figure 6. Disease/Condition for Which CAM Is Most Frequently Used*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back pain</td>
<td>16.8</td>
</tr>
<tr>
<td>Head cold</td>
<td>9.5</td>
</tr>
<tr>
<td>Neck pain</td>
<td>6.6</td>
</tr>
<tr>
<td>Joint pain</td>
<td>4.9</td>
</tr>
<tr>
<td>Arthritis</td>
<td>4.9</td>
</tr>
<tr>
<td>Anxiety/depression</td>
<td>4.5</td>
</tr>
<tr>
<td>Stomach upset</td>
<td>3.7</td>
</tr>
<tr>
<td>Headache</td>
<td>3.1</td>
</tr>
<tr>
<td>Recurring pain</td>
<td>2.4</td>
</tr>
<tr>
<td>Insomnia</td>
<td>2.2</td>
</tr>
</tbody>
</table>

*These figures exclude the use of megavitamin therapy and prayer.
APPROACH TO CHRONIC PAIN

Mind Body and integrative approach

Pharmacologic therapy
Evidence based approach to chronic pain

Wholistic approach

Combined integrative approach

Non narcotic

Non narcotic for a small selected sub group
THOUGHTS?
QUESTIONS?