UVM Project ECHO: Chronic Pain

Facilitators:
Mark Pasanen, MD
Charles Maclean, MD
Liz Cote
Agenda

- Introductions and announcements
- Session objectives
- Didactic presentation (30-35 min)
  - Q & A
- Case presentation
  - Clarifying questions
  - Discussion
    - First, participants – then program faculty
  - Summary of recommendations
- Session parking lot items for follow up
- Closing reminders
  - Complete session evaluation (session recording info included in this email)
  - Session slides posted at [www.vtahec.org](http://www.vtahec.org)
  - Submit a new case, template posted at [www.vtahec.org](http://www.vtahec.org)
CME Disclosures

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Participants should claim only the credit commensurate with the extent of their participation in the activity.

Interest Disclosures:

• As an organization accredited by the ACCME to sponsor continuing medical education activities, UVM CMIE is required to disclose any real or apparent conflicts of interest (COI) that any speakers may have related to the content of their presentations.
UVM Project ECHO Chronic Pain: Acupuncture for Chronic Pain

Speaker: Robert Davis, MS, L.Ac
Co-President - Society of Acupuncture Research

December 13, 2019
Objectives

1. How does acupuncture work?
2. Is acupuncture safe?
3. Is acupuncture effective?
4. Is acupuncture cost-effective?
5. Questions
Session 1
Opening Plenary

The Science of Acupuncture for Chronic Pain

Friday June 28, 2019
9–9:45 AM

Evidence-Informed Patient Care
Jun Mao, MD, MSCE
Chief, Integrative Medicine Service
Laurance S. Rockefeller Chair in Integrative Medicine
Memorial Sloan Kettering Cancer Center

Basic Mechanistic Research
Richard Harris, PhD
Associate Professor, Chronic Pain & Fatigue Research Center, Anesthesiology
Associate Professor, Division of Rheumatology Internal Medicine, University of Michigan

Translational Research
Vitaly Napadow, PhD, LicAc
Associate Professor
Harvard Medical School
Director, Center for Integrative Pain NeuroImaging
Co-President, SAR

Safety, Efficacy & Comparative Effectiveness
Hugh MacPherson, PhD
Professor of Acupuncture Research
Dept of Health Sciences, University of York
Clinical Director, York Clinic for Integrated Healthcare
Chair of Trustees at the Northern College of Acupuncture

Economic Evaluation of Acupuncture in the Age of the Opioid Crisis
Claudia M. Witt, MD, MBA
Professor of Medicine, University of Zurich
Director, Institute for Complementary and Integrative Medicine
University Hospital Zurich
Evidence-Informed Patient Care

Jun Mao, MD, MSCE

Chief, Integrative Medicine Service
Laurance S. Rockefeller Chair in Integrative Medicine
Memorial Sloan Kettering Cancer Center
Can acupuncture help patients with chronic pain?

How does it work?

Is it safe?

Is it effective?

Is it cost-effective?
Evidence-Based Medicine (EBM)

Integration of the best available research evidence with our clinical expertise and our patient’s values and circumstances

Sackett et al. Evidence-Based Medicine. How to Practice and Teach EBM. 2nd ed.
Evidence-Based Medicine (EBM)

- Basic Research, Mechanisms
- Translational Research
- Safety, Efficacy, and Comparative Effectiveness
Basic Mechanistic Research

Richard Harris, PhD
Associate Professor, Chronic Pain and Fatigue Research Center, Anesthesiology
Associate Professor, Division of Rheumatology, Internal Medicine
University of Michigan
Local Effects: Connective Tissue & Fibroblast Remodeling

• Acupuncture imparts mechanotransduction by winding collagen and elastic fibers with downstream cellular, molecular, and genetic consequence

• May be another source of peripheral coupling with nervous system

Ultrasound of rat subcutaneous tissue
Needle inserted only

Langevin et al. FASEB J 2002;16(8):872–874

Local Effects: Blood Flow Response

• Acupuncture increases local deep-tissue blood flow

• Deeper insertion and evoking de qi sensation led to greater increases of blood flow

• Probably axon reflex-related, likely with cascade of cytokine / molecular release

Local Effects: Adenosine Release

- Adenosine, a neuromodulator with antinociceptive properties, was released in mice during acupuncture.
- Local antinociception required adenosine A1 receptor expression.

Goldman et al. *Nat Neurosci* 2010;13(7):883-888
Central effect: Endogenous Opioid

*Endorphins implicated*
- Naloxone (endorphin antagonist) blocks acupuncture analgesia effect

Mayer et al. *Brain Res* 1977;121:368–372
Opioid Hypothesis

Differential effects with electroacupuncture stimulation frequency

Low-frequency EA → Enkephalin, endorphin

High-frequency EA → Dynorphin

Han JS. Neurosci Lett 2004;361(1-3):258-261
Acupuncture Changes MOR BP

- Acupuncture increases mu-Opioid receptor binding potential
- Sham decreases MOR BP or has no effect

Harris et al. *Neuroimage* 2009;47(3):1077-1085
Translational Research
Vitaly Napadow, PhD, LicAc
Associate Professor
Harvard Medical School
Director, Center for Integrative Pain NeuroImaging
Co-President, Society for Acupuncture Research
Functional Neuroimaging Modalities
Hemodynamics, Metabolism, Electrophysiology, Neurochemistry

- **Neural Activity**
- **Electromagnetic Response** (EEG, MEG)
- **Neurotransmitter Response**
  - \(\uparrow\) Glu, GABA, endorphin
  - \(\uparrow\) Receptor Binding (eg, m-opioid)
- **Hemodynamic Response**
  - \(\uparrow\) Blood Flow
  - \(\uparrow\) Blood Volume
  - \(\uparrow\) Blood Oxygenation

- **PET**
- **H-MRS**
- **Optical**
- **fMRI**
Characterization Studies
Brain fMRI Response to Acupuncture in Humans

Over 100 acupuncture needle stimulus fMRI studies published ... How to summarize?

GingerALE: Brainmap.org; ALE, Activation Likelihood Estimation
Advancing patient care through scientific evaluation

- 149 Publications met inclusion criteria
- English, Chinese, Korean, Japanese databases
- 34 Studies (377 subjects) included for GingerALE Meta-analysis

fMRI Outcomes: Acupuncture Trial for CTS → Neuroplasticity

Rewiring the primary somatosensory cortex in carpal tunnel syndrome with acupuncture

Yumi Maeda,1,2,* Hyungjun Kim,1,3,* Norman Kettner,2 Jieun Kim,1,3 Stephen Cina,1 Cristina Malatesta,4 Jessica Gerber,1 Claire McManus,5 Rebecca Ong-Sutherland,4 Pia Mezzacappa,1 Alexandra Libby,1 Ishtiaq Mawia,1 Leslie R. Morse,5 Ted J. Kaptchuk,6 Joseph Audette7 and Vitaly Napadow1,2

fMRI Outcomes: Acupuncture Trial for CTS→Neuroplasticity

Safety, Efficacy & Comparative Effectiveness

Hugh MacPherson, PhD
Professor of Acupuncture Research
Dept of Health Sciences, University of York
Clinical Director, York Clinic for Integrated Healthcare
Chair of Trustees at the Northern College of Acupuncture
Acupuncture Trialists’ Collaboration

Aims

• **To establish efficacy:** Is acupuncture better than sham/placebo?

• **To establish effectiveness:** Is acupuncture better than usual care, standard care, and/or wait-list?

Acupuncture Trialists’ Collaboration

Methods

• Individual patient data meta-analysis
• 39 High-quality acupuncture trials in a single database
• 20,827 Patients with chronic pain
  – Osteoarthritis
  – Headache/migraine
  – Low back and neck pain

Acupuncture Trialists’ Collaboration

Results

“Significant differences between true and sham acupuncture indicate that acupuncture is more than a placebo” \(^1\) \((P<.001)\)

Acupuncture vs Usual Care

ACU vs Usual Care

Effect size
Sham vs Usual Care

ACU vs Usual Care: 60%

Sham ACU vs Usual Care
Acupuncture vs Sham

Acupuncture provides an additional 40% benefit over and above sham (placebo).
Long-Term Benefits with Acupuncture

Standardized Change Score (higher = better)

vs Usual care controls

Trajectory: At 12 months, 90% of acupuncture benefit is maintained

Trial data to 2008
Thicker line = 5 trials or more

Acupuncture Is Safe...

Minimal risk of serious adverse events in over 1 million acupuncture treatments

- 0.05 per 10,000 treatments
- 0.55 per 10,000 individual patients
- Most common side effects
  - Bleeding at needle site
  - Localized needling pain

Similar findings
In a prospective study of 229,230 patients with over 2 million visits

2. Witt et al. Forsch Komplementmed 2009;16(2):91–97
...vs NSAIDs Adverse Effects Profile

• Among 1457 patients vs 10,000 controls, upper GI bleed RR: 4.7 \(^1,2\)

• Among 52,293 patients taking NSAIDs, RR of hospitalization for upper GI problems: 3.94 \(^1,3\)

RR, relative risk

“On average, 1 in 1200 patients taking NSAIDs for at least 2 months will die from gastroduodenal complications who would not have died had they not taken NSAIDs” \(^4\)

Acupuncture for Chronic Pain in the Vermont Medicaid Population: A Prospective, Pragmatic Intervention Trial

Robert T Davis, MS, LAc, Gary Badger, MS, Kristina Valentine, MS, Alexander Cavert, MS, and Remy R Coeytaux, MD, PhD
156 patients enrolled
1274 treatments by 28 Licensed Acupuncturists
Change in PROMIS scores (pre vs. post-treatment)

- **Physical Function**: 10th to 21st percentile
- **Sleep Disturbance**: 79th to 56th percentile
- **Fatigue**: 88th to 69th percentile
- **Pain Interference**: 94th to 82th percentile
- **Depression**: 82nd to 70th percentile
- **Pain Intensity**: 70th to 58th percentile
- **Anxiety**: 87th to 77th percentile
- **Social Isolation**: 63rd to 55th percentile

1 std dev.
In their words....
"Acupuncture helped me to get my life back."

"I literally went in there day one thinking it was quack science and now I desperately miss it."

“I gained 2 hours of sleep a night from the acupuncture because it helped me relax. 100% would recommend to anybody with pain”
Odds ratio of early or long-term opioid exposure for entry points compared to back pain starting with a PCP. To the left of the PCP index line represents lower likelihood of opioid exposure, to the right represents higher likelihood of opioid exposure. For acupuncture entry point, the odds of early opioid exposure is 91% lower and long-term opioid exposure is 93% lower when compared to PCP entry point.

QUESTIONS???
• STOP RECORDING
Cases/HIPAA

DO NOT INCLUDE:
• Names
• Address
• DOB
• Phone/Fax #
• Email address
• Social Security #
• Medical Record #

The discussion and materials included in this conference are confidential and privileged pursuant to 26VSA Section 1441-1443. This material is intended for use in improving patient care. It is privileged and strictly confidential and is to be used only for the evaluation and improvement of patient care.
Reminders

• Volunteers to present cases (key to the Project ECHO)
• Use the case template form posted at www.vtahec.org
  • Return completed case forms to: Mark.Pasanen@uvmhealth.org
• Please complete evaluation survey after each session
• Claim your CME at www.highmarksce.com/uvmmmed
• Please contact us with any questions, concerns, or suggestions
  • Mark.Pasanen@uvmhealth.org
  • Elizabeth.Cote@uvm.edu
  • ahec@uvm.edu