East Meets West
Acupuncture: History, Usage, Safety and Research

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April 14, 2012

Objectives

- Learn the background of acupuncture and traditional Chinese medicine (TCM)
- Learn about the use of acupuncture in the USA
- Understand current evidence on acupuncture in primary care
- Discuss the mechanism of action of acupuncture
- Learn the TCM theory on pain and related symptoms and its treatment
- Participate in a hand-on workshop on acupressure.
Traditional Chinese Medicine

 Herbal Medicine
 Zhong Yao

 Acupuncture
 Zhen Jiu

 Mind/Body Exercises
 QiGong, Tai Chi

 Manipulation/Laying of Hands
 Tui Na

 Dietary Therapy

Use of Acupuncture in the United States
What a recent NIH survey tells us?

Visits to acupuncturists per year per 1000:


State licensure of acupuncturists in the U.S.

Alabama, Kansas, North Dakota, Oklahoma, South Dakota, and Wyoming have no acupuncture regulation; only physicians are legally allowed to practice acupuncture in these states.
Acupuncture most often used to treat painful conditions or diseases: 2002

Burke et al 2006

Acupuncture: Insurance coverage by Employer Plans

From R. Nahin
Physician favorable opinion towards acupuncture


History of Acupuncture
Traditional Chinese Medicine (TCM)

- Over 3,000 years in China
- Huang Di (Yellow Emperor)-- Founder of TCM
- Legendary author of the first medical book

From Huang ZY and Rose K. Who can ride the Dragon? Paradigm Press, Brookline MA: 1995

Huangdi’s Internal Classic (Huangdi Nei Jing)

- 475 – 221 BCE
- earliest known Chinese medical text
- Su Wen (Plain Questions)
- Ling Shu (Miraculous Pivot)
Influence of Ancient Chinese Philosophy on TCM

Yin Yang Theory  Qi- Vital Energy  Five Elements Theory

Meridian and Points
- 14 meridians with points
- Meridians run longitudinally
- 361 points on these meridians

Acupuncture Definition

Family of procedures inducing stimulation of anatomical locations on the skin

Stimulation methods include:
- manual manipulation
- electrical stimulation
- moxibustion

Penetration of the skin by thin, solid metallic needles

Moxibustion

Cupping

**Bian Stone Needles:**
The earliest acupuncture instrument, 21st century BCE


**Metal Acupuncture Needles**

Gold needles, circa 113 BCE


Stainless steel needles, 20th century
Disposable Needles

Development of Needling Techniques

- Ear (auricular) acupuncture
- Scalp acupuncture
- Face acupuncture
- Hand acupuncture
- Nose acupuncture
- Foot acupuncture
- Trigger point acupuncture
Auricular Acupuncture

Cover of *Specimen Medicinae Sinicae* showing a Chinese physician

1682

First European acupuncture Point chart, from Willem Tel Rhijne

1683

Developments of Acupuncture in the USA

- 1826 - Dr. Bache published first clinical study on acupuncture
- 1974 – FDA labeled acupuncture as an investigational device
- 1996 – U.S. FDA reclassified acupuncture as a medical device
- 1997 – U.S. NIH Consensus Development Conference on acupuncture

Exploratory Period (1826 – 1971)

First American Acupuncture Article

North American Medical and Surgical Journal

Original paper, Franklin Bache 1826
“My impression is, that acupuncture possesses a remarkable power in removing and mitigating pain.”


**Pre-regulatory Period (1971 - 1982)**

- In 1971, James Reston, a *New York Times* reporter, wrote about his experience with acupuncture treatment for his postoperative pain following surgery in China

![Open-heart surgery under acupuncture anesthesia, Shanghai, 1974](image)

- Many acupuncture texts translated

NIH Acupuncture Consensus Panel
Findings for Clinical Evidence

Clear or promising evidence:
Adult post-operative pain
Post-operative dental pain
Nausea and vomiting

Some Promising Evidence:
Menstrual cramps, tennis elbow, fibromyalgia,
osteoarthritis, headache, carpal tunnel syndrome, post
stroke syndrome, lower back pain, tendonitis

Acupuncture. NIH Consensus Statement Online 1997 Nov 3-5; month, day];
15(5):1-34.

Over 600 new trials in acupuncture since the 1997 Panel

Safety of Acupuncture
### Complications of Acupuncture 1965 - 1999

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis</td>
<td></td>
<td>94</td>
</tr>
<tr>
<td>Auricular</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Internal organ/tissue injuries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumothrax</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Spinal cord injury</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td><strong>Other complications</strong></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td><strong>Adverse effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact dermatitis</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

Total: 202 cases

### Research on Acupuncture
Federally-supported (NIH) research on acupuncture has substantially increased over time

Effectiveness of Acupuncture as Adjunctive Therapy in Osteoarthritis of the Knee: A Randomized Trial

Brian Berman, M.D., Lixing Lao, Ph.D., Patricia Langenberg, Ph.D.
Wen Lin Lee, Ph.D., Adele M.K. Gilpin, Ph.D., J.D.,
Marc C. Hochberg, M.D.
University of Maryland School of Medicine

Funded by the National Center for Complementary and Alternative Medicine (NCCAM) NIH Cooperative Agreement U01 AT-00171
Study Design

- Three arm parallel design: (N = 570)
  1) Real acupuncture
  2) Sham acupuncture control
  3) Attention / education control group

- Multi-sites
- Patients randomized by computer
- Outcomes assessor blinded to group assignment
- Standard outcome measurements: Western Ontario and McMaster University Osteoarthritis (WOMAC) Index
- P ≤ 0.05 is considered to be statistically significance.
Results

WOMAC Pain Score

Results

WOMAC Function Score
Effect of Acupuncture for Postoperative Oral Surgical Pain

Lao et al., Statistics in Medicine, 2011, DOI: 10.1002/sim.4003

Funded by NIH-NCCAM Grant # AT00010
Pl: Lixing Lao, Ph.D., L.Ac.
Co-Investigator: Brian Berman, MD

Center for Integrative Medicine
University of Maryland School of Medicine

Study Design

Three Arms (N = 180)

1) Real acupuncture
2) Sham insertion acupuncture control
3) Sham non-insertion (placebo) acupuncture
Table 2. Observed Frequency of Pain Status (Felt 1st pain and requested rescue pain medication)

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th># of pts pain free after 1st Tx</th>
<th># of pts who felt the 1st pain</th>
<th># of pts who did not request pain medication</th>
<th># of pts who asked for pain medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>True Acupuncture</td>
<td>60</td>
<td>25</td>
<td>35</td>
<td>31</td>
<td>29</td>
</tr>
<tr>
<td>Sham Acupuncture</td>
<td>60</td>
<td>19</td>
<td>41</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Placebo Acupuncture</td>
<td>60</td>
<td>19</td>
<td>41</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

Comparison of Average Time Before 1st Pain (in Minutes)

P value = 0.058
Using the Log-Rank Test, estimated survival time was significantly longer in the true acupuncture group than in placebo, P value = 0.0338.

A Randomized Trial Comparing Acupuncture, Simulated Acupuncture, and Usual Care for Chronic Low Back Pain
Cherkin, Sherman, et al., Arch Intern Med. 2009;169(9):858-866

- 2605 patients screened
- 641 Randomized participants
- Individualized Acupuncture (n=157)
- Standardized Acupuncture (n=158)
- Simulated Acupuncture (n=162)
- Usual Care (n=161)
- 10 treatments provided over 7 weeks
- Outcomes assessed at baseline, and 8, 26, and 52 weeks
Results: Primary Outcomes

1. Back-related Dysfunction (Roland-Morris Disability Questionnaire score; range, 0-23)

2. Symptom bothersomeness (0-10 scale)

**Short Term Improved at 8 Weeks**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dysfunction Improvements:</th>
<th>Symptoms Improvements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualized Acupuncture</td>
<td>60%</td>
<td>1.6-1.9 points</td>
</tr>
<tr>
<td>Standardized Acupuncture</td>
<td>4.5 points</td>
<td></td>
</tr>
<tr>
<td>Simulated Acupuncture</td>
<td>4.4 points</td>
<td></td>
</tr>
<tr>
<td>Usual Care (meds, PC, PT)</td>
<td>39%</td>
<td>0.7 points</td>
</tr>
</tbody>
</table>

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Results: Secondary Outcomes

1. Back-related Dysfunction (Roland-Morris Disability Questionnaire score; range, 0-23)

2. Symptom bothersomeness (0-10 scale)

**Long Term Improved at 1 Year**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dysfunction Improvements:</th>
<th>Symptoms Improvements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualized Acupuncture</td>
<td>59%-65%</td>
<td>P=.02</td>
</tr>
<tr>
<td>Standardized Acupuncture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulated Acupuncture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual Care (meds, PC, PT)</td>
<td>50%</td>
<td>P&gt;.05</td>
</tr>
</tbody>
</table>

P>.05
Results: Secondary Outcomes

1. Cutting down on activities
2. Missed work or school
3. Medication consumption

Long Term Improved at 1 Year

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Decreased Activities</th>
<th>Missed Work Days</th>
<th>Pain Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualized Acupuncture</td>
<td>5%-7%</td>
<td>P&lt;.001</td>
<td>47%</td>
</tr>
<tr>
<td>Standardized Acupuncture</td>
<td></td>
<td>P&gt;.05</td>
<td></td>
</tr>
<tr>
<td>Simulated Acupuncture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual Care (meds, PC, PT)</td>
<td>18%</td>
<td>16%</td>
<td>59%</td>
</tr>
</tbody>
</table>

Basic Science: Mechanism of Action

**Western Scientific Viewpoint**

- Nerve pathways activated
- Neurotransmitters & hormones released
- Local immune & circulatory responses triggered
- Gene expression altered
Mechanisms of Acupuncture on Inflammatory Pain

Effect of Acupuncture on Brain Image in Patients with Carpal Tunnel Syndrome (CTS)

Napadow et al., NeuroImage 2007
Napadow et al., HBM 2006
Challenges of Acupuncture Research

- Adequate Control
- Adequate Blinding
- Proper Concealment
- Practitioner Skill
- Time points of outcome assessments

Blind Men Guessing on Elephant
Information Related to Acupuncture Practice

- Licensure requirements
- Qualification and training
- Length of each treatment session
- Cost of each treatment session
- Third party payers: BC/BS, Atana, etc.

LI 4 → PC 6 → GB 20
Acknowledgements

The studies were funded by the National Center for Complementary and Alternative Medicine (NCCAM) NIH, Grant Number 1 P50 AT00084, U01 AT-00171, P01 AT002605-01A1, RO1 AT00010 and R24 AT001293.

The studies were implemented by our research team:
Ruixin Zhang, Xiaoya Wang, Arthur Yin Fan, Bing Liu, Linbo Wang, Ke Ren, Mary Bahr, Jody Boone, Marcos Hsu, Michelle Sittig, Deborah Taber, Danuta Bujak, Amy Martin Burns, Ming Tan, Pat Langenber, Marc Hochberg, Wenlin Lee, Lixing Lao and Brian Berman.

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