Brief History of Traditional Chinese Medicine (TCM) and Acupuncture

- In ancient China
  - One of the oldest healing practices in the world, dating back over 4000 years
  - Acupuncture is part of Traditional Chinese Medicine
- In modern China
  - Two mainstream medicines – Traditional Chinese Medicine and Western Medicine

About Zhaoxue Lu

- TCM orthopedics & traumatology B.Med and M.Med for 8 yrs
- Additional Doctoral of TCM endocrinology for 3 yrs
- Faculty position at OCOM since 2004
- Staff Acupuncturist at OHSU FM since 2007
- Privileged at Legacy Good Samaritan Medical Center since 2014
- Private Practice since 2006

About Fang Zhang

- Bachelor degree of TCM for 5 yrs
- Master degree of ENT specialty for 3 yrs
- DAOM degree at OCOM
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Outline

- Brief introduction of history of TCM
- Introduction of a few TCM
- What does TCM include?
- What does acupuncture treat?
- What do we know about acupuncture and meridians?
- How does acupuncture work?

In Western Countries and the United States

- 1971-New York Times columnist James Reston
- 1974-Oregon is the first state to conduct exams and license practitioners
- 1996-FDA approved acupuncture needles as “safe and effective medical devices”
- Present-the World Health Organization recommends its use for 200+ conditions
- Recognized health profession with strict licensure in the U.S
Now, About My Operation in Peking

We inhale Qi

Qi travels within the blood

Organs-Zang Fu

Medical Dictionary Definitions of Qi

1. Air, gas, vapor, flatus
2. Smell
3. Aura
4. Environmental Forces (e.g., cold, dampness, dryness, etc.)
5. Nature
6. Anything of a particular nature
7. Breath
8. Strength
9. Anger
10. Disease
11. An abbreviation for diseases of qi
12. Any of various dynamic phenomena of the body
   a. Activity
   b. Warming
   c. Defense
   d. Transformation


Qi (Chi)(pronounced“chee”)
### Meridians/Acupuncture Points
- Run across all over the body
- 12 regular meridians
- 8 extraordinary meridians
- Over 360 named points

### TCM Diagnosis
- Inquiring: chills/fever, perspiration, energy, appetite and dietary habits, elimination, sleep, etc
- Observation: Tongue inspection; facial complexion
- Palpation: Pulse taking and point palpation
- Listening: gurgling, coughing, quality of speech

### What Does TCM Include?
- Traditional Chinese Medicine has 5 branches
  - Chinese Herbal Medicine
  - Acupuncture Treatment
  - Tui Na/Massage
  - Nutrition & Lifestyle
  - Meditation & Exercise

### 1. Chinese herbal Medicine
- Internal Herbal Medicine
  - Bulk Herbs/Herbal Tea
  - Granules
  - Patent pills
- Topical Herbal Medicine
  - Herbal patches
  - Ointment
  - Tincture
  - Topical compress and soaking

### Bulk Herbs
2. Acupuncture

- Regular body acupuncture
- Electrical acupuncture
- Moxibustion
- Auricular acupuncture
- Scalp acupuncture
- Intradermal acupuncture
- Plum-blossom
- Cupping
- Gua Sha
Regular Acupuncture

Electrical Stimulation Acupuncture

Moxibustion

Auricular Acupuncture


- 5NP-dotoxification protocol
Scalp Acupuncture

Nathan Adrian Explains Cupping
https://www.youtube.com/watch?v=mQ2zmP1ZflqA

Cupping

Gua Sha

3. Tuina/
Massage

4. Nutrition &
Lifestyle
5. Meditation & Exercise

Oxford Levels of Evidence
- Level 1a: Systematic Review (SR) with homogeneous RCTs
- Level 1b: Individual RCT with narrow confidence intervals for primary outcomes
- Level 2a: SR with homogeneous cohort studies
- Level 2b: Individual Cohort Study (including low quality RCT-e.g.<80% follow-up)
- Level 3a: SR with homogeneous case-control studies
- Level 3b: Individual case-control study
- Level 4: Series (& poor quality cohort/case-control studies)
- Level 5: Expert opinion

1997 NIH consensus statement:
- “There is sufficient evidence of acupuncture’s value to expand its use into conventional medicine and to encourage further studies of its physiology and clinical value.”
- A list-Clear evidence for only 3 conditions
  - post-operative nausea
  - chemotherapy-related nausea
  - post-operative dental pain

Nausea and Vomiting
- It has strongest evidence from clinical trials reduce the intensity and frequency 1-3
- Prevention of postoperative nausea and vomiting (PONV)
- Acupuncture is recommended as a complementary therapy when nausea and vomiting associated with chemotherapy are poorly controlled. Grade of recommendation, 1B 1

Level of evidence: 1A


Nausea and Vomiting
- The most common acupuncture pints for the treatment of Chemotherapy Induced Nausea and Vomiting (CINV) are PC-6 and ST-36.
### Post-Surgical Pain

- Acupuncture has been demonstrated to relieve adult postsurgical pain\(^1\)
- Acupuncture reduced pain in patients following neck dissection \((p=0.008)\)\(^2\)
- Non-significant trend in decreased analgesic and narcotic use \(^2\)
- No significant pain relief in intradermal acupuncture administration in post-thoractomy patients \(^3\)

**Level of evidence: 2A**

\(^1\) NIH Consensus Statement 2 Pflueger 05 (20) 2010 2 Song J: Arch Therapi Surg (130) 2008 3 Sellick SM: Cancer Prev Control 1998

### Devices Developed from Acupuncture Theory

- **TENS Unit**
- **Acupressure Wristband- Sea-Band**
- **Urgent PC-for overactive bladder**

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### 1997 NIH Consensus Statement

**B List**
- Conditions for which evidence suggests acupuncture “may be useful”:
  - Addiction
  - Stroke rehabilitation
  - Headache
  - Menstrual cramps
  - Tennis elbow, fibromyalgia, myofacial pain, osteoarthritis, low back pain, carpal tunnel syndrome
  - Asthma

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### Clear Progress since 1997

- Field of acupuncture research significantly expanded and matured since 1997
- Large number of rigorous phase II/III RCTs successfully completed for a broad range of medical conditions
- Basic research studies, employing state-of-the-art tools have identified numerous biochemical and physiological correlates of acupuncture
- Novel controls for acupuncture treatments have been developed and employed in clinical and basic research

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### German Acupuncture Trials in Which Verum Acupuncture Was Found Slightly Better or Equivalent to Minimal Sham Acupuncture

<table>
<thead>
<tr>
<th>Condition</th>
<th>Reference</th>
<th>Randomized # Total/# sham</th>
<th># Sham Needles (to match verum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Back Pain</td>
<td>Brinkhaus 06</td>
<td>301/75</td>
<td>12-20</td>
</tr>
<tr>
<td>Osteoarthritis*</td>
<td>Milt 05</td>
<td>300/76</td>
<td>8-10 (unilat): 16-20 (blat)</td>
</tr>
<tr>
<td>Headache (Migraine)</td>
<td>Lind 05</td>
<td>304/81</td>
<td>10-20</td>
</tr>
<tr>
<td>Headache (Tension)</td>
<td>Michel 05</td>
<td>270/63</td>
<td>At least 10</td>
</tr>
<tr>
<td>Headache (Migraine)</td>
<td>Diener 06</td>
<td>960/339</td>
<td>Up to 12</td>
</tr>
<tr>
<td>Low Back Pain</td>
<td>Haake 07</td>
<td>1162/387</td>
<td>14-20</td>
</tr>
</tbody>
</table>

\(^*\) Acu > sham at 8 wks; acu = sham at 6 mos and 12 mos follow-up

Cummings M. Modellvorhaben Akupunktur—a summary of the ART, ARC and GERAC trials. Acupunct Med 2009; 27:2-6-38

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**Arch Intern Med 2012;Sep 10:1-10.**

- Analyzed pooled data from large-scale acupuncture RCTs for back & neck pain, OA, chronic HA, and shoulder pain: 29 RCTs; total 17,922 patients
- Found: Acu > sham and > no-Acu control for each pain condition \((p < .001)\)
- Found: Effect size for Acu vs. no-Acu control (usual care) > Acu vs. sham
New Recommendation

- A list - conditions for which evidence of acupuncture efficacy is considered “promising”
  - Adult post-op and chemotherapy nausea/vomiting
  - Post-operative dental pain
  - Move from B List to A List
    - Low back pain
    - Osteoarthritis of knee
    - Myofacial pain/fibromyalgia

- B list - conditions for which evidence suggests acupuncture “may be useful”:
  - Addiction, stroke rehabilitation, headache, menstrual cramps, tennis elbow, carpal tunnel syndrome, asthma
  - New adding to B List
    - Labor-related pain
    - Assistance for IVF

In Conclusion

- A list - there is clear evidence that acupuncture is effective for
  - Adult post-op and chemotherapy induced nausea/vomiting
  - Post-operative pain and dental pain
  - Osteoarthritis of the knee
  - Chronic low back pain
  - Myofacial pain/fibromyalgia

- B List
  - Conditions for which evidence suggests acupuncture “very useful”:
    - Addiction
    - Stroke rehabilitation
    - Headache
    - Menstrual cramps
    - Tennis elbow, carpal tunnel syndrome
    - Asthma
    - Labor-related pain
    - Assistance for IVF

Other Benefits

- Leukopenia
- Immune System Modulation
- Inflammation
- Insomnia
- Anxiety and depression
- Overall quality of life

What Do We Know About Acupuncture Points and Meridians?

- Morphological correlates
- Bioelectrical correlates
- Functional correlates
Morphology of Acupuncture Points

- Small nerve bundles (Williams et al 1989)
- Nerves (Chan 1984)
- Blood vessels (Chan 1984)
- Trigger points (Travell & Simons 1983)
- Major motor points of muscles (Liu 1977)
- Connective tissues and fascia (Langevin 2001)

Connective tissue correlates of acupoints and meridians

**Take home:** High (80%) correspondence between acupoint sites and inter-muscular or intra-muscular connective tissue planes.

Ultrasound imaging of GB-32 (AP) and control point (CP)
Langevin HM, Yandow JA. Anat Rec 2002; 269(6):257-65

Bioelectrical correlates of acupoints & meridians

- 1950’s pioneering studies:
  - Nakatani (Japan), identified *Ryodoraku* ‘good conductance lines’
  - Niboyet (France)
  - Voll (Germany)
  - Becker (US, 1976-1979)

"No evidence that penetration of muscle results in greater pullout force than penetration of subcutaneous tissue."

**Take home:** Connective tissue mediates 'needle grasp'; muscle penetration is not necessary.

Consider analogy of fascia network to spider webs

- Consider flies hitting webs as acu needles contacting fascia
- Compare impact of flies/needles at nodes/junctions vs. strands
Bioelectrical correlates of acupoints & meridians

Take home: Acupoints suggested to be sites of high conductance.

Continuous readout of conductivity along a meridian

Take home: Lower impedance between acupoints on meridian than between sites off meridian.
Is this fMRI data reproducible?

Is this fMRI data indicative of:
- neural pathways?
- meridians?
- an undefined signaling system?

Acupuncture's Mechanism of Action

How does Acupuncture Work??

Acupuncture Analgesia (AcuA)

- Acupuncture needling stimulates nerve fibers in muscle
- Modulates pain signals in the CNS at level of spinal cord, midbrain and cortex via descending inhibitory pathway
  - Release of endogenous opiate in blood and CSF
  - Adenated by naloxone
  - β-endorphin and small enkalphins

Take home:
1. Slow onset and decline of AcuA suggest hormonal rather than neural basis.
2. Block of AcuA by procaine suggests initial event is neural but procaine could have non-neural effects.

Morphine antagonist also blocks AcuA

First demonstration of endogenous opioid involvement in AcuA

![Graph showing morphine antagonist blocking AcuA](image-url)

**Take home:** Morphine antagonist also blocks AcuA
**Take home:**
Confirms that mechanisms of AcuA and morphine are similar

**Brain fMRI-CNS activity**
- New research effect of acupuncture on connective tissue
  - Liberation of fibroblasts
  - Anti-inflammatory
- CNS activity via mapping pathways of functional connectivity in the brain
- Areas of activation and deactivation following acupuncture administration

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**Conclusion about Acupuncture Analgesia**
- Acupuncture analgesia (AcuA) is mediated in part by circulating hormones, e.g. opioids and other molecules.
- AcuA and morphine-induced analgesia have a similar biological basis.
- Different frequencies of electro-acupuncture release different types of endogenous opioids (‘endorphins’).
- Pain thresholds are determined by a balance of endogenous opioids and endogenous anti-opioids.
- Placebo analgesia and acu analgesia both act in part via ‘endorphin’ release but likely by different pathways
Other Theories of Acupuncture’s Mechanism of Action

- Acupuncture stops pain by releasing substance P
- Acupuncture reduces inflammation
- Acupuncture vasconstricts cerebral blood flow in migraines
- Acupuncture vasodilates blood vessels
- Acupuncture releases serotonin & dopamine
- Acupuncture increases local nutritive blood flow
- Acupuncture stimulates the C & A delta fibers; creating an axon reflex

References: