



**Integrating Acupuncture in Pediatric Perioperative Care and Pain Medicine Workshop**  
**SPA/SPPM 2015**

針灸

Yuan-Chi Lin, M.D., M.P.H.  
 Associate Professor of Anesthesiology and Pediatrics  
 Harvard Medical School  
 Director, Medical Acupuncture Service  
 Senior Associate in Anesthesia and Pain Medicine  
 Children's Hospital Boston



## DISCLOSURE

- NONE

## Objectives

- Upon completion of this workshop, participants will:
- Enhance their knowledge of acupuncture and have an opportunity to integrate
- acupuncture for the practice of pediatric pain medicine.
- Learn the history and theory of acupuncture

## Objectives

- Understand the scientific evidence of acupuncture practice
- Evaluate acupuncture micro-system paradigms
- Incorporate acupuncture in pediatric perioperative care and pediatric pain practice
- Participate in hands-on demonstration of acupuncture and related techniques

## Outlines

- Pain and suffers
- Acupuncture as a complementary medical therapy
- Qi and meridians
- Mechanism of Acupuncture
- Practice aspect of pediatric acupuncture



## A Case with Persistent Pain.....

- A 12-year-old patient with left leg pain for six months after a gymnastic practice.
- She has "20"/10 pain.
- She cannot go to school and cannot sleep at night.
- She was admitted for pain management

## A Case with Headaches

- A 12-year-old patient was admitted for headaches.
- Admitted for right temporal headache.
- Pain score: 8 out of 10.
- Normal head CT.
- Treatment: sumatriptan, metoclopramide, and ketorolac.

## Intractable Nausea and Vomiting

- An 8-year-old patient s/p T&A.
- In spite of iv fluid, Zofran<sup>®</sup> (ondansetron), and Reglan<sup>®</sup> (metoclopramide) the patient continues experiencing nausea and vomiting.
- What should you do next?



## Adolescent with Abdominal Pain

- A fifteen-year-old girl with epigastric abdominal pain.
- Pain score: 10/10
- Afebrile, frequent loose stool.
- Upper endoscopy and colonoscopy: no abnormality.
- Abdominal and pelvic ultrasound: normal.

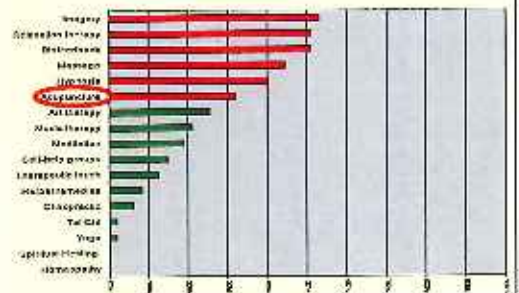


**Pain may be mandatory,**

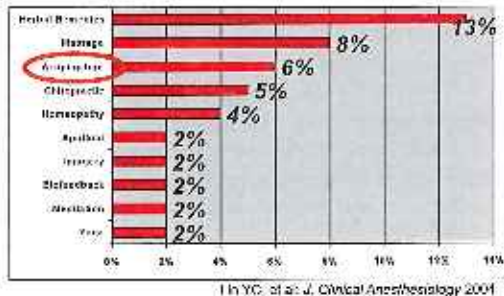
**but suffering is optional.**

**Suffering is what drives patients to seek health care.**

## Usage of CAM in Podiatric Pain Services in Northern America



## Pediatric Preop Clinic Survey



## Acupuncture and Moxibustion

- Acupuncture = Jin Jio (Chinese)  
= Needle + Moxibustion
- Originating in China more than 2000 years ago, it is now widely used in the States.



## Acupuncture

- Acupuncture is the stimulation of special acupuncture points on the body, usually by insertion of fine hair-thin needles for
  - Therapeutic
  - Preventive purposes
- Early awareness of needle-like therapy that used bamboo or bone needles to open abscesses may have contributed to the development of acupuncture.

- Traditional Chinese Medicine theories are embedded in naturalistic theories of Chinese philosophy and are compatible with
  - Confucianism
  - Taoism
  - Buddhism



## Zhen Jiu Jia Yi Jin (A Basic Text in Acupuncture)

- The superior physician controls disease before any illness has declared itself.
- The average physician practices acupuncture before the disease has come to its crisis.
- The inferior practitioner treats the patient when the illness is already dying away.

51-56 Huang, 282 A.D.





## Basic Theory and Conceptual Framework of TCM

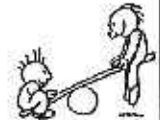
Yin and yang reflect all forms and characteristics existing in the universe.



## Yin-Yang

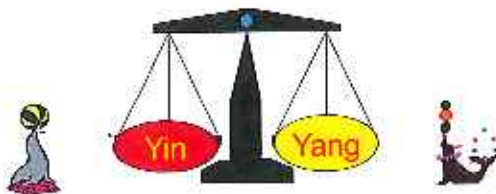


- Opposition
  - Yin and yang are two opposite aspects
- Inter-dependence
  - Yin and yang cannot exist in isolation
- Inter-transforming (not absolute)
  - Yin and yang transform into each other
- Inter-consuming (supporting)
  - Yin and yang are in a constant state of dynamic balance



## Theoretical Basis of Acupuncture

- Well-being = Balanced Yin and Yang.



## Qi 氣 (Chee)

The human body is controlled by a vital force called "Qi".

## The Origin of Qi 氣 (Chee)



## Nutrition

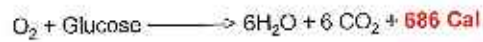
- Qi comes from living plants and animals.
- Fresh
  - Eating fresh would provide maximum Qi from the food.
- Natural
  - Gu Qi
  - Food Qi
- Organic



## Qi 氣 (Chee)

The human body is controlled by a vital force called "Qi".

氣 = 气 + 米 = Air + Rice



## Qi 氣 (Chee)



- Qi is inherited at birth and maintained during life by the intake of food and air.
- Qi circulates throughout the body.
- Qi nourishes and defends every part of the body. Illnesses are associated with disharmony or disturbances of Qi.



## Acupuncture

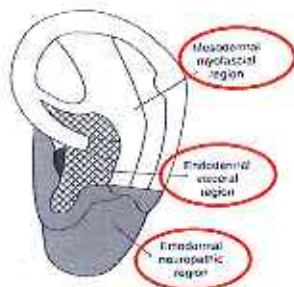
- Approximately 365 acupuncture points have been defined.
- Meridian is the continuous pathway connected the acupuncture points through limbs, trunk and head.



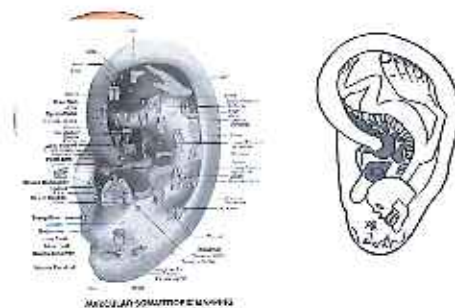
## Meridian Systems

- Primary Meridians
- Tendinomuscular Meridians
- Divergent Meridians
- Shu-Mu Subsystem
- Curious meridians (Extraordinary M.)

## Auricular Acupuncture



## Auricular Acupuncture



- Changes in the electrical conductivity of the acupuncture points in the ear had high agreement with the true location of the chronic pain in distant parts of the body.



Auricular acupressure reduces anxiety in patients being transported to hospital.

Koher, A et. al. *Anesthesiology* 2003

Reduced both pain and anxiety in elderly patients with hip fracture during emergency transportation.

Barker, R et. al. *Acad Emerg Med* 2005



## Diagnosis of Illnesses 中醫診斷

- Can diagnose by inspection (望診)
  - Shen 神 / supernatural healer
- Can diagnose by listening (聞診)
  - Sheng 聖 / Sage healer
- Can diagnose by asking (問診)
  - Gong 工 / artisan
- Can diagnose by palpation (切診)
  - Chou 巧 / technician
  - Nan Jing Chapter 50



難經

## Looking

- In 1575, Zhou You-Fan compiled a list of 15 steps in a pediatric diagnosis. Eleven out of the 15 steps have to do with looking or inspection.





## Qi (氣)

- Defense Qi (Wei Qi)
  - Surrounds the body
  - produced from process of digestion and metabolism
- Nourishing Qi (Rong Qi)
  - Circulates in the interior of the body.
  - To assure harmonious functioning of organs.
- Original Qi (Yuan Qi)
  - Regulates all Qi activity.
  - Inherited, constitutional and dimensional Qi.



## Acupuncture Therapy

- Neutralization
  - Cleaning and warming Yin/Yang
- Coping management
  - Harmonizing and regulating qi and blood
- Tonification
  - Retreat and reclaim qi



## Acupuncture Therapy vs. Conventional Therapies

- Neutralization
  - Cleaning and warming Yin/Yang



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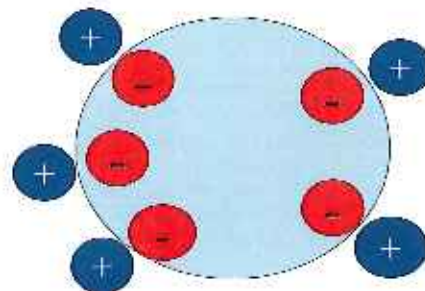


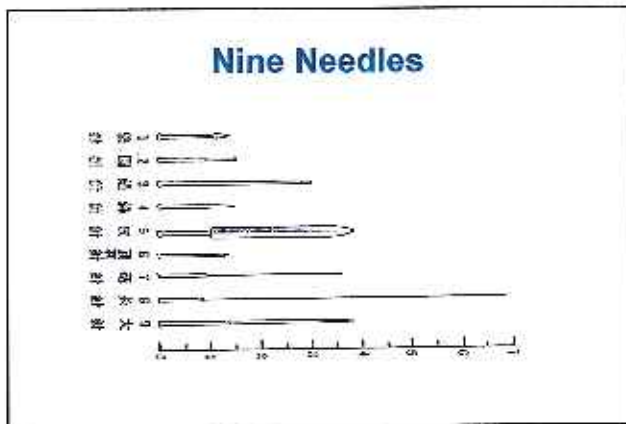
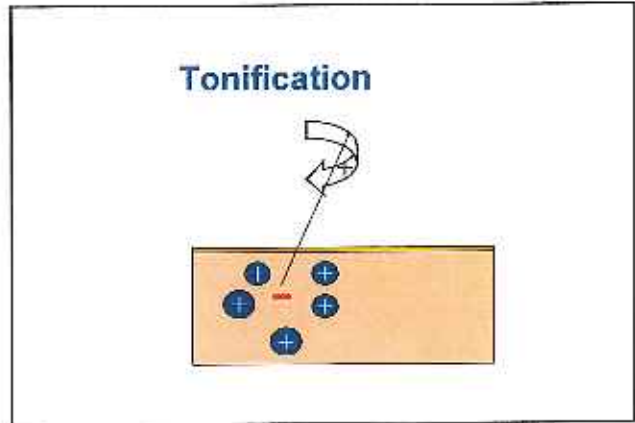
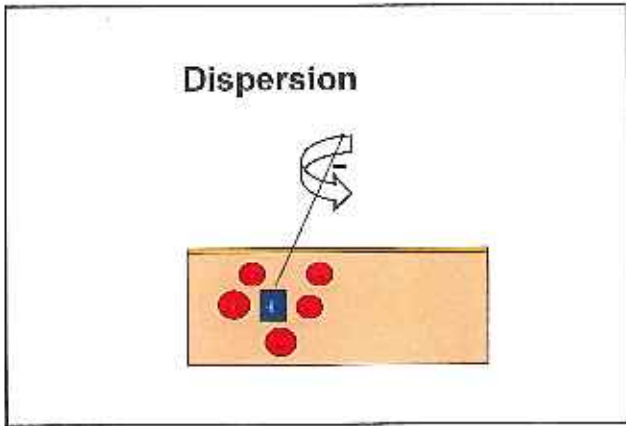
## Acupuncture Therapy vs. Conventional Therapies

- Neutralization
  - Cleaning and warming Yin/Yang
- Coping management
  - Harmonizing and regulating qi and blood
- Tonification/Rehabilitation
  - Retreat and reclaim qi




## Electric Fields in Cells/Organs






### Acupuncture vs. EMG vs. IV Needles




	Gauge	Diameter in mm
Acupuncture needles	42	0.14
	40	0.16
	38	0.18
	36	0.20
	34	0.22
EMG needles	30	0.30
	27	0.40
	26	0.45
	23	0.60
IV needles	22	0.72
	18	1.24

### How Safe is Acupuncture?





- Review of nine surveys; adverse events:
  - Pain on insertion (1% to 45%)
  - Tiredness (2% to 11%)
  - Bleeding (0.03% to 59%)
  - Feelings of faintness and syncope (0 to 0.25%)
  - Feelings of relaxation (85%)
  - Pneumothorax (2 cases)
    - *Brnt & White Am J Med 2001; 110:481-485*
- 76 acupuncturists; 31,822 acupuncture Tx.
  - *Wheeler A, et al. BMJ 2001; BMJ 32:407*
- 1648 acupuncturists; 34,407 acupuncture Tx.
  - *MacPherson H, et al. BMJ 2001; 32:495*



### Acupuncture Points Stimulated by

- Acupuncture needles



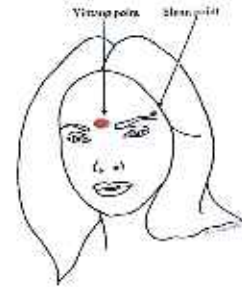
## Tui Na

- Pediatric massage
- Mentioned in the Nei Jing, dated first century BC.



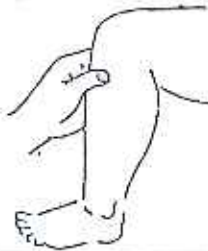
## Acupressure

- Acupressure applied on the Yintang (extra-1 acupuncture point) reduces bilateral index values and stress in volunteers
  - Fassoulaki, A. et. al. *Anesth & Analg* 2003 & 2007
- Acupressure of the Yintang point may be used as a treatment for parental preoperative anxiety
  - Wang SM, et. al. *Anesth & Analg* 2005



## Tui Na (穴位推拿治療)

- Pediatric massage
- Mentioned in the Nei Jing, dated first century BC.



推拿  
經絡  
治療

## Gwa Sha (刮痧療法)

- "Gwa" means scraping skin with a round edged smooth instrument in order to produce a redness of the skin.
- "Sha" means sand, and refers to sand-like appearance of the skin.
- Indications
  - Fever
  - Pain management

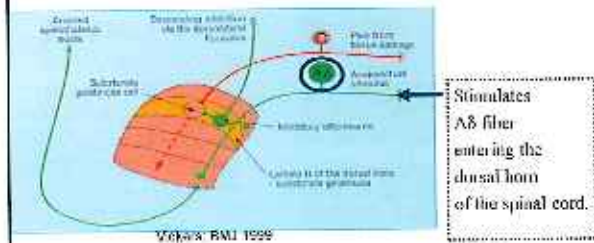


## Acupuncture Points Stimulation by

- Acupuncture needles
- Moxibustion, heat, low level laser
- Electrical stimulation
- Cupping
- Laser (low level laser therapy)
- Finger/Pressure
  - Acupressure
  - Shiatsu
  - Tui na



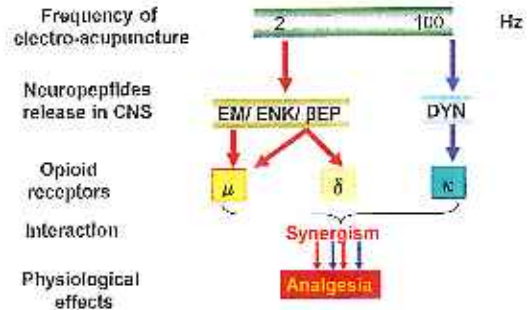
## Basic Science Evidence



## Basic Science Evidence



## Neurochemical Basis of Acupuncture Effects



## Basic Science Evidence

- The effects of acupuncture in one rabbit could be transferred to another rabbit by CSF transfusion.
- Acupuncture analgesia could be reversed with naloxone in a dose-dependent manner.
  - Pomeranz & Glax 1969



## Analgesic Effect of Acupuncture

- fMRI exam 12 people were exposed to heat pain and received either actual or sham acupuncture.
- Greater fMRI signal change increases were found during verum acupuncture when compared to sham acupuncture.
- Changes in PET binding potential is also suggesting increased endogenous opioid release.
  - Chen et al. Pain Research 2004



## Nerve Block and Acupuncture



- Brain signals in participants receive acupuncture.
- Nerve block inhibits brain activities by acupuncture.
- Acupuncture modulates brain activities through nerve network.**
  - Gu, W, et al. Anesthesiology 2013

## Research Trials in Acupuncture

- Clinical report and research on acupuncture has unique methodological challenges.
- Randomized placebo controlled double blinded trial does not exist in Chinese Medicine.
- There are differences in
  - Type of acupuncture
  - Training and experience of the acupuncture provider
  - Selection of the acupuncture points
  - Number of the treatments
  - Outcome measurements
  - Choosing a following-up times



**Acupuncture for the Management of Emergence Agitation Pain after Bilateral Myringotomy and Pressure Equalization Tube Insertion**



Pediatric patients scheduled for bilateral myringotomy tube surgery

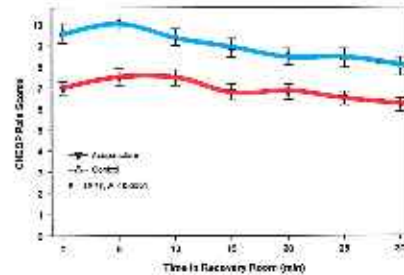
Randomization

Group 1: Acupuncture at bilateral LI-4 and HT-7 points.

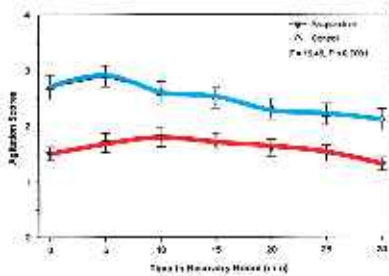
Group 2: No acupuncture.



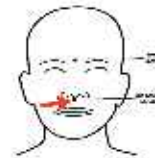
**CHEOP Pain Scores**



**Agitation Scores**



**Cardiovascular Resuscitation**



- Acupuncture reversed cardiovascular depression induced by morphine and halothane.
- Acupuncture at GV26 will increase cardiac output, stroke volume, heart rate, mean arterial pressure.
  - Lee DC et. al. Can Anesth Soc J 1991



**Acupuncture for Gastrointestinal Disorders**

- Prevention and tx of nausea and vomiting
- Promote post-operative GI recovery after abdominal surgery
- Functional esophageal disorders
- Functional dyspepsia
- Irritable bowel syndrome
- Constipation.
  - Wan et. al. J Traditional Chinese Med 2001
  - Droide E et. al. Digestive Diseases and Sciences 2001
  - Onyang H. Aliment Pharmacol Ther 2005
  - Schneider A, et. al. Gut 2006





## Acupuncture for the Treatment of Pain

- Meta-analyses of studies of acupuncture for chronic pain shows a responsive rate
  - 70% for acupuncture
  - 50% for "sham" acupuncture
  - 30% for controlled
    - Shlay JC, et. al., JAMA 1998



## Recurrent Headaches

- The existing evidence suggests that acupuncture has a role in the treatment of recurrent headaches
  - Melchart D. Cephalalgia 1999
- Tension Headache
  - 40 patients RCT
  - Electro-acupuncture is effective for short term symptomatic relief of tension-type headache.
    - Xie CC et. al. Headache 2004
- Acupuncture vs. Sumatriptan
  - 179 patients RCT
  - Acupuncture and sumatriptan were more effective than placebo in the early treatment of an acute migraine attack.
    - Melchart D, et. al. J of Internal Medicine 2009
- Acupuncture vs. Metoprolol
  - 114 patients RCT
  - Acupuncture might be an effective and safe treatment option for patients unwilling or unable to use drug prophylaxes.
    - Sheng A, et. al. Headache 2006

## Migraine Prophylaxis

- 22 trials with 4419 participants
- Available studies suggest that acupuncture is at least as effective as, or possibly more effective than, prophylactic drug treatment, and has fewer adverse effects.
- Acupuncture should be considered a treatment option for patients willing to undergo this treatment.
  - Cochrane Database Syst Rev. 2009



## Tension-type Headache

- 11 trials with 2317 participants
- Outcomes: at least 50% reduction of headache frequency, headache days, pain intensity and analgesic use.
- Acupuncture could be a valuable non-pharmacological tool in patients with frequent episodic or chronic tension-type headaches
  - Cochrane Database Syst Rev. 2009

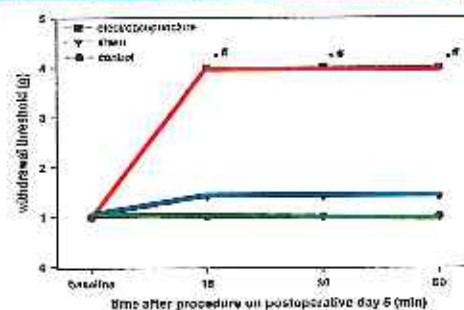


## Peripheral Neuropathy

- 250 patients RCT tested for the effectiveness of acupuncture to treat HIV related peripheral neuropathic pain
  - No evidence of effectiveness was found.
    - Shlay JC, et. al., JAMA 1998
- 47 patients with peripheral neuropathy as diagnosed by nerve conduction studies were evaluated over a period of 1 year.
  - 21 patients received acupuncture therapy
  - 26 patients received the best medical care
- Sixteen patients (75%) in the acupuncture group improved symptomatically and objectively.
- There is a positive effect of acupuncture on peripheral neuropathy.
  - Schroder S, Eur J Neurol 2007



## Electroacupuncture in Neuropathic Pain in Rats





*Commonwealth of Massachusetts*  
**BOARD OF REGISTRATION IN MEDICINE**

*Regulations, Policies & Guidelines*

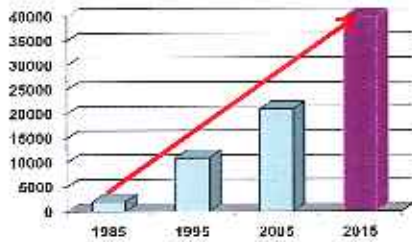
- **2.00: THE PRACTICE OF MEDICINE**
- 2.07: General Provisions Governing The Practice Of Medicine
  - (1) Acupuncture. Acupuncture is the practice of medicine and may be performed only by a full licensee or by an acupuncturist duly licensed and registered in the Commonwealth.

**Physicians in Acupuncture Medicine**

- American Academy of Medical Acupuncture
- New England Society of Medical Acupuncture
- American Board of Medical Acupuncture



**Number of the Acupuncturists**



**Medical Therapies Model**

- Address the patient as a whole
- Emphasize the well-being. 'Well-being is not just absence of diseases'
- Value the optimal functioning
- Consider patient's backgrounds: beliefs, family, culture and community



**Hands-on**

- Hands-on demonstration and practice of acupuncture will be provided on each station.