

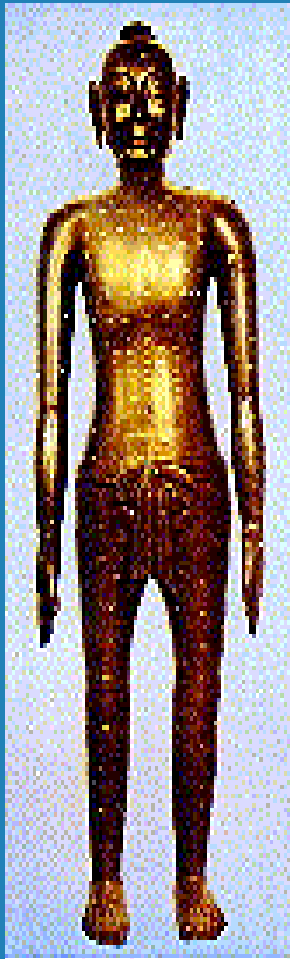
Acupuncture: New and Old Concept for Healthcare



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Nashville, TN 37203

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What is Acupuncture



- is one of the key components of traditional Chinese medicine (TCM)
- is a family of procedures to stimulate points on the body (acupoints)—most commonly is the insertion of thin, solid metallic needles.
- is intended to remove blockages in the flow of energy ("Qi"), restore and maintain health
- is with thousands of years' history

Types of Acupuncture



Classical
acupuncture



Electroacupuncture



Laser
acupuncture



Cupping



Acupoint
injection



Moxibustion



Acupuncture: A New Concept for HealthCare in US

Current health care:
"mainstream" medicine—
Conventional or Western Medicine

- **Prevention:** vaccination, isolation...
no acupuncture
- **Diagnosis:** Not use TCM method
- **Treatment:** Not include as a routine method
- **Healing:** Not include as a routine method
- **Insurance:** No cover for prevention, no cover for acupuncture

Acupuncture?
...never heard of
it

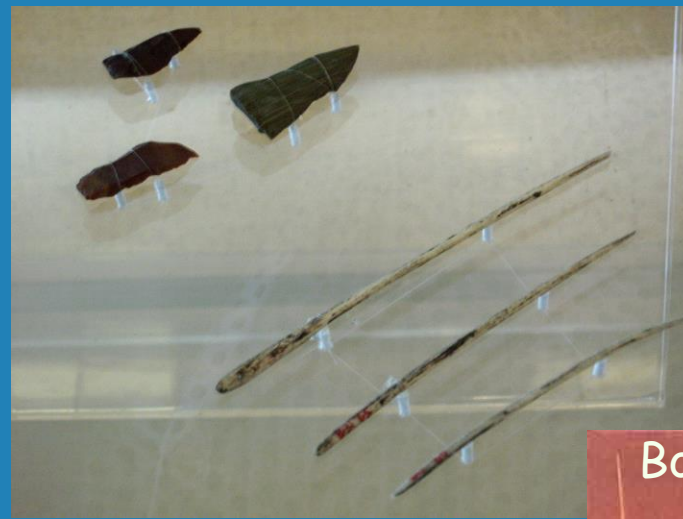
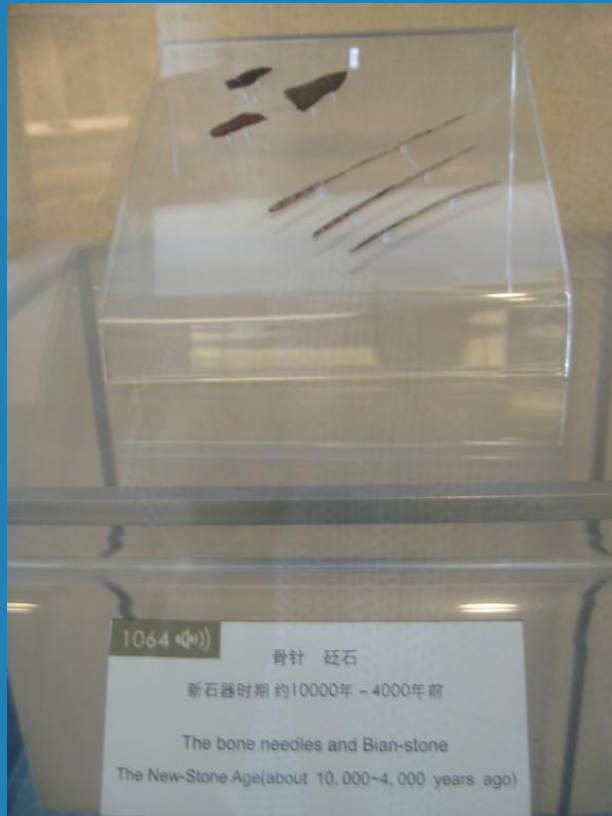




Acupuncture: An old Concept for HealthCare in the East



How Old Is Acupuncture?



"Bian" Stone and
Bone needles

New Stone Age 5000BC



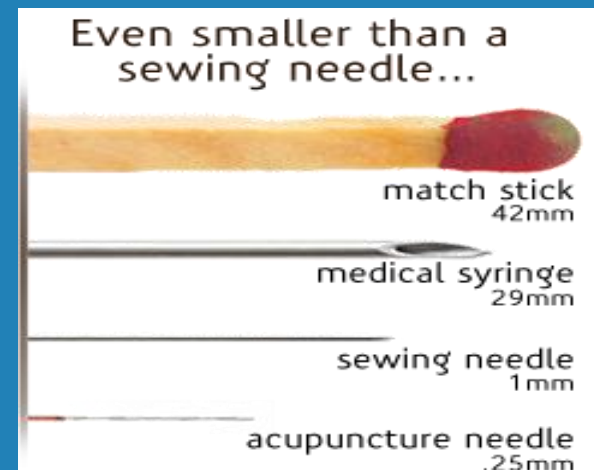
Acupuncture: An old Concept

Ancient Needles



Han Dynasty, 200BC-220AD

Modern Needles





Acupuncture: An old Concept for HealthCare in the East

- Acupuncture is a key component of **traditional Chinese medicine (TCM)**
- **TCM** had been a main healthcare system for thousands of years before western medicine introduced
 - **Prevention:** Diet, herbal remedies, qigong, **acupuncture**, TuiNa...
 - **Diagnosis:** Use all TCM methods: yin-yang, tongue, pulse, **Meridian, five elements...**
 - **Treatment:** **Acupuncture, moxibustion**, herbal remedies, TuiNa, Diet, qigong ...
 - **Healing:** All TCM modalities including **acupuncture**
 - **Insurance:** Cover All TCM modalities including **acupuncture**

What Is Traditional Chinese Medicine (TCM)

A whole medical system that originated in China. It is based on the concept that disease results from disruption in the flow of qi and imbalance in the forces of yin and yang. Practices including **acupuncture**, herbs, meditation, massage, and diet seek to aid healing by restoring the yin-yang balance and the flow of qi.

--NCCAM

- A medical system with 3,000+ year's history for prevention, diagnosis, treatment and rehabilitation of illness
- Holistic perception of mind, body, health and diseases
- Unique terminology and medical theories
- Individualized (personalized) medicine
- Comprehensive plan for **healthcare**

Comparison of East & West

East

- ∞ Empirical Observations over Thousands of Years
- ∞ Art of Medicine
- ∞ Holistic View
- ∞ Circular Logic
- ∞ Energetic

West

- ∞ Scientific Method & Case-Based Medicine
- ∞ Technology of Medicine
- ∞ Molecular and Organ View
- ∞ Linear Logic
- ∞ Mechanistic

Modalities of TCM

- ∞ Acupuncture, moxibustion and cupping
- ∞ Chinese Materia Medica and Prescription:
 1. Botanical Sources -Herbology
(root, stem, bark, leaf, flower, fruit and seeds)
 2. Zoological sources
(antilope/buffalo horn, chicken gizzard membrane, musk, turtle shell, oyster shell etc.)
 3. Mineral- (Gypsum, mirabilite, borneol, cinnabar, etc.)
- ∞ Tui Na/Body manipulation (massage, acupressure, corrective manipulation)
- ∞ Qigong/Tai'Chi
- ∞ Diet/nutrition

Traditional Chinese Medicine



Alimentotherapy





Basic Principles of TCM

- **Ying-Yang**
- **Qi, Xue (blood), Jing (Essence), Ye (body fluid)**
- **Zang-Fu (Internal Organ)**
- **Maridian (Channel)**
- **Five element**

5 Element Cycle

- Productive
- Destructive
- Weaken



Yin-Yang

- The Tao of Universe
- The principle of all matters
- The parentage of all change
- The origin of birth and death

--Su Wen

The Tao is the One,
From the One come Yin and Yang;
From these two, creative energy;
From energy, ten thousand things;
The forms of all creation.

All life embodies the yin
And embraces the yang,
Through their union
Achieving harmony.

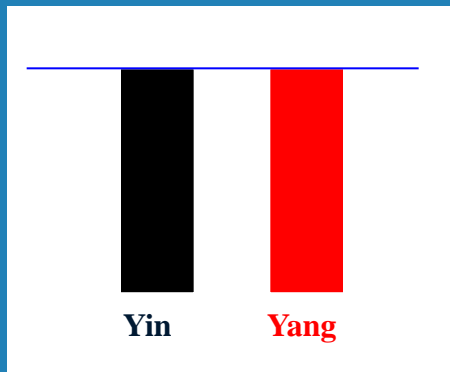
--Tao Te Ching, C42



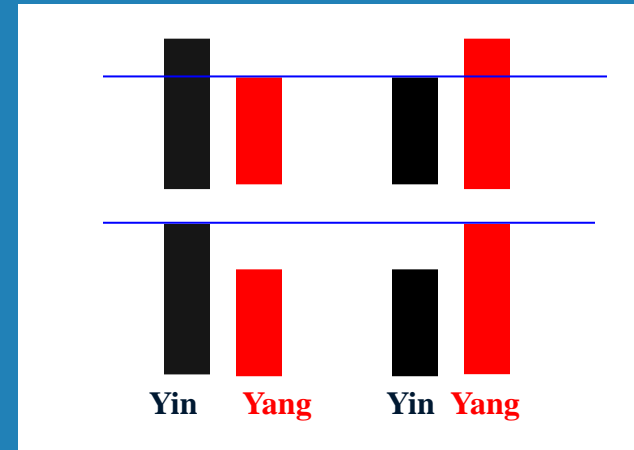
Yin-Yang

- Concept describing how things function in relation to each other and to the universe
- complementary opposites as parts of whole

Yin-Yang balance



Yin-Yang imbalance



Yin-Yang relationship:

- Opposition
- Interdependence
- Mutual consumption
- Inter-transformation

Application of Yin-Yang

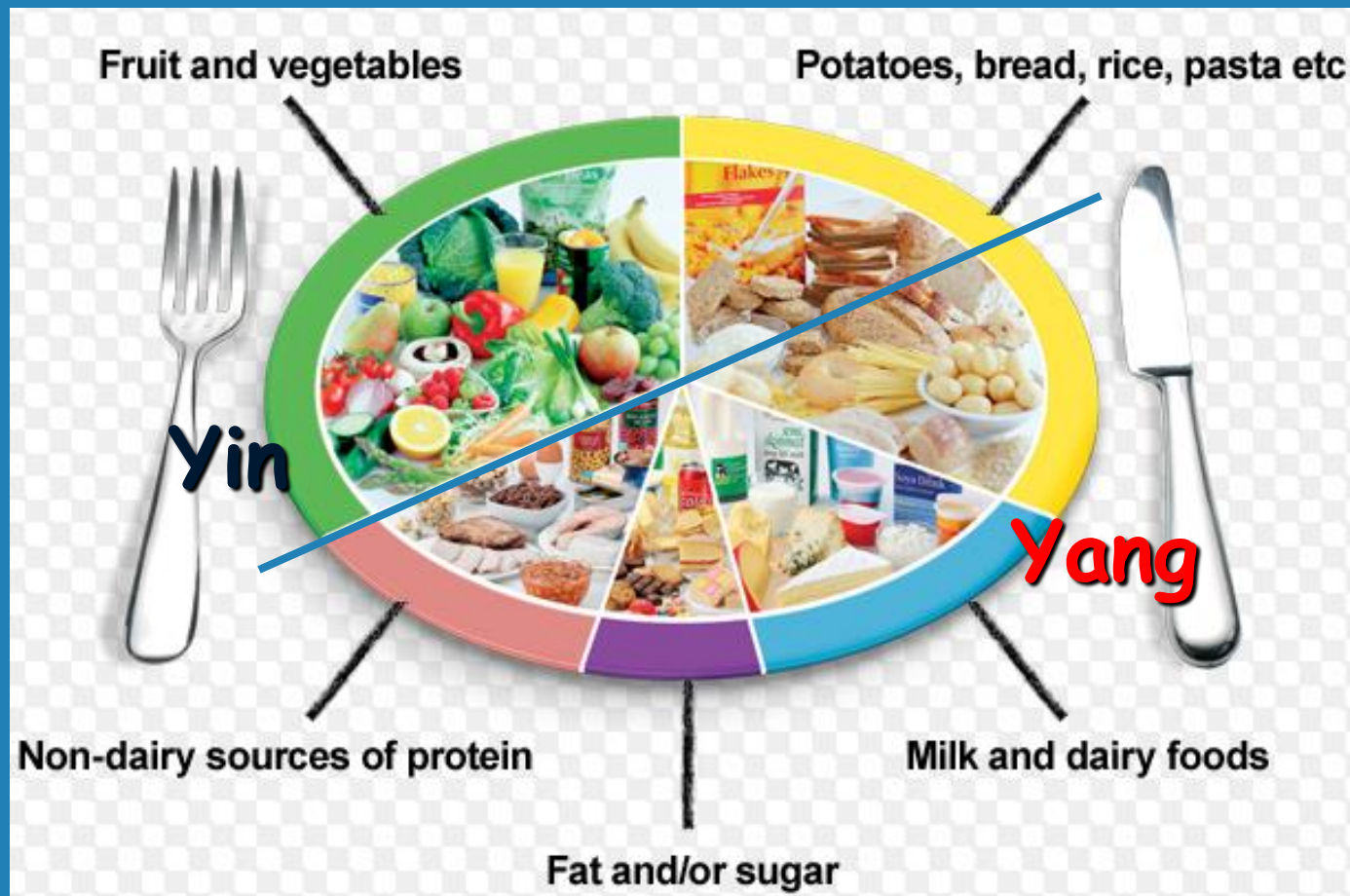


	YIN	YANG
•Structure of human body	front, interior	back, exterior
•Physiology	structure	function
•Pathology	hypo-function	hyper-function
•Diagnosis	exterior, heat, excess	interior, cold, deficiency
•Chinese medicine	cold/cool, sour, salty, bitter	hot/warm, pungent, sweet
•Treatment	replenish Yin/ Yang deficiency, reducing excessive heat or fire with cold drug; treating excessive cold with warm drug	

Application of Yin-Yang



Eat balanced



Application of Yin-Yang

Keep fit physically and mentally



Yang



Yin

Brain Yin-Yang



Yin Chemicals

GABA
Glycine
5-HT
DA
Endorphin
Estrogen
Melatonin
...

Yin



Yang Chemicals

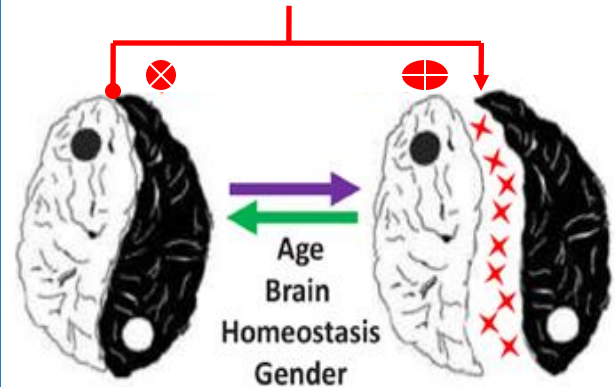
Glutamate
NE
Ach
Adenosine
Testosterone

Yang

dreamstime.com

Sleep/memory Yin-Yang

Stress Nicotine



Normal:
Attention
Memory
Mood
Neurogenesis

Abnormal:
Attention deficit
Memory deficit
Depression/Anxiety
Neurodegeneration
Decreased Neurogenesis
Oxidative stress

Balanced

Imbalanced

Qi (Chi 气)



Qi --life energy, moving force (Yang)

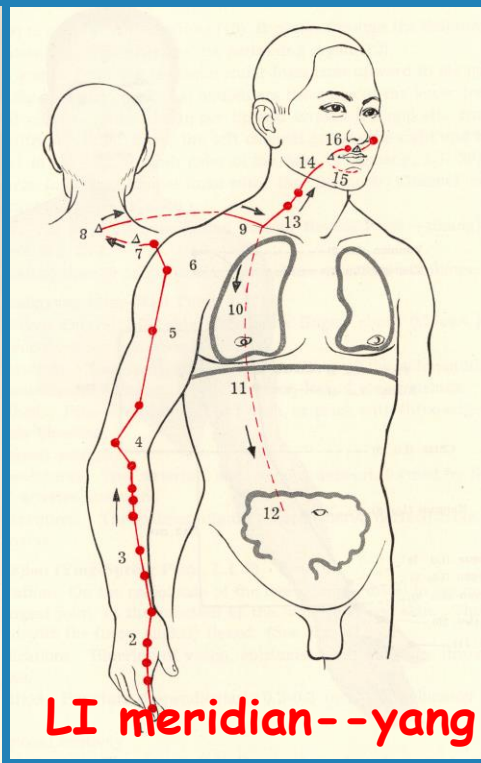
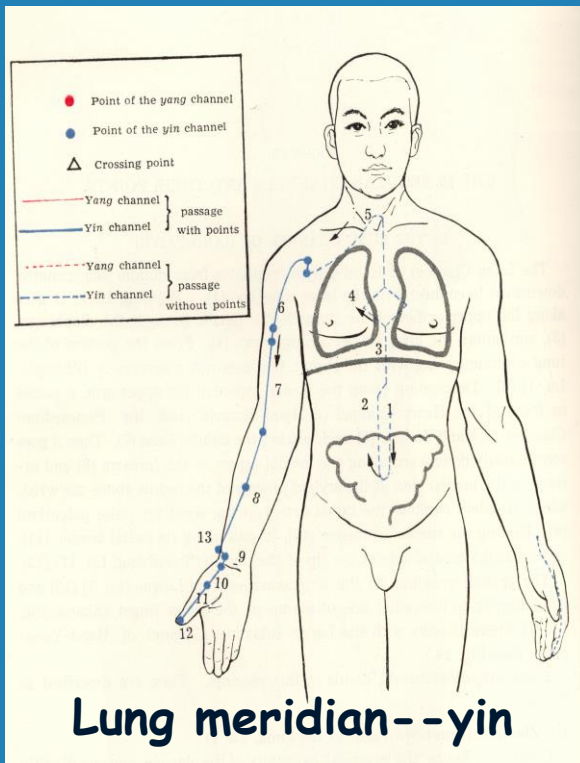
Types of Qi:

Origin: Yuan Qi (prenatal-parents),
Zong Qi (postnatal-breathing),
Ying Qi (nourishing Qi-food)
Wei Qi (defending Qi-food)

Structure: Zang-Fu Qi (Qi of internal organ)
Meridian Qi

Function of Qi: Promoting, defending, warming,
consolidating and governing, “Qi Hua” (metabolizing
and transforming)

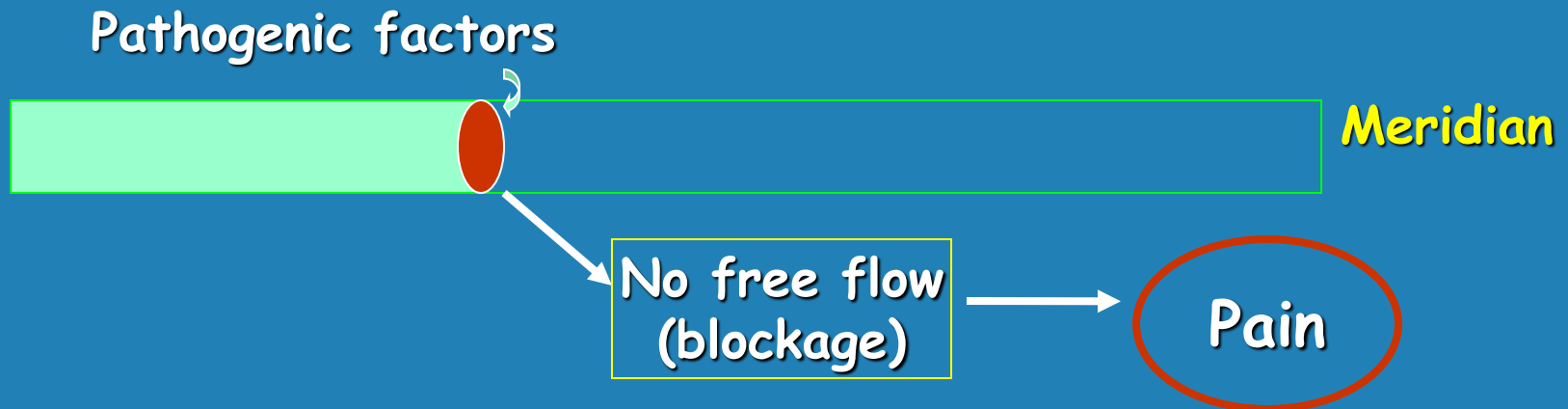
Meridian Systems--Pathways for "Qi" Flow & Links of All Systems



- 14 regular meridians
- All acupoints distribute along meridians
- Bridge in and out of the body
- Reflect pathophysiology of the inside.
- Guide the treatment

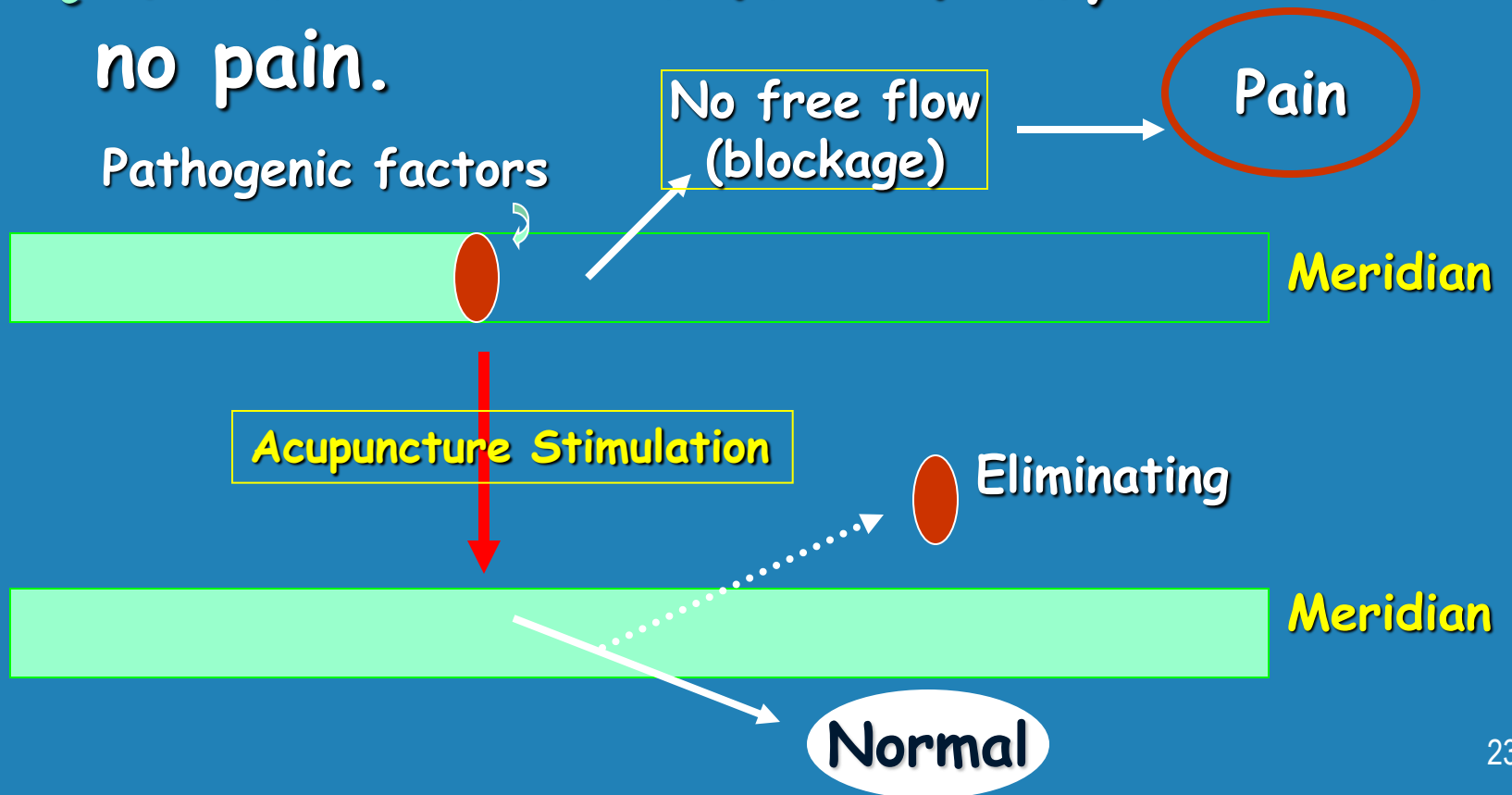
Meridians

∞ Where there is no free flow (blockage), there is pain.



Meridians

Ω Where there is free flow, there is no pain.



Zang-Fu (脏腑) -- Internal Organs

Functional systems, not pure anatomical ones

Five Zang
(Yin organs)

Liver (Gan)

Heart (Xin)

Spleen (Pi)

Lungs (Fei)

Kidneys (Shen)

Six Fu
(Yang organs)

Gallbladder

Small intestine

Stomach

Large intestine

Bladder

Three warmers

Extraordinary
Organs

Brian

Medulla

Bone

Vessel

Gallbladder

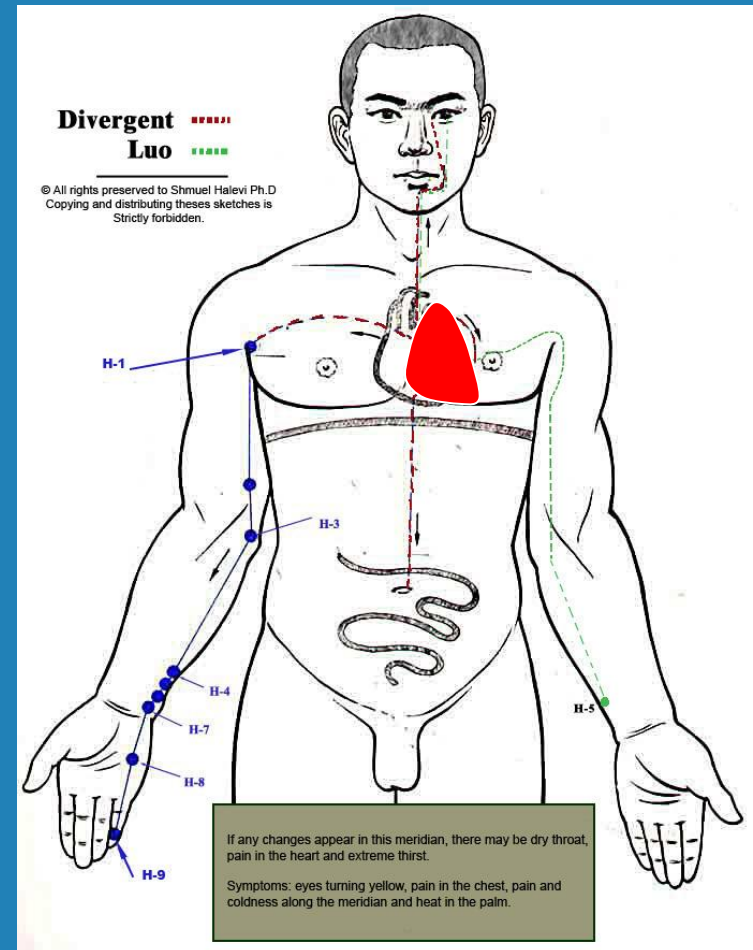
Uterus

Mind-body connection

Heart (心):

The monarch of all organs

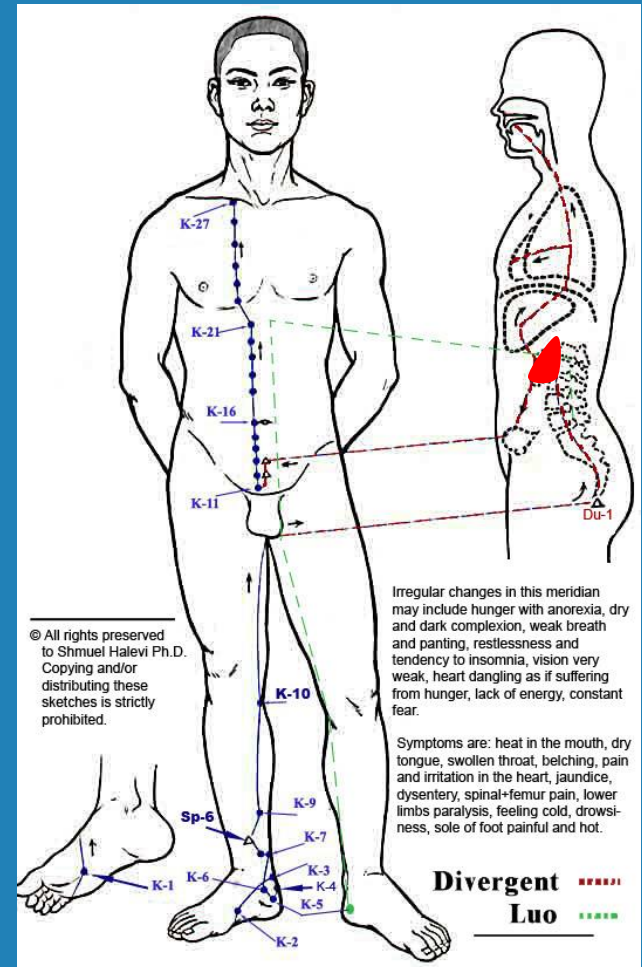
- Controls blood and vessels
- Houses mind and governs mental activity
- Controls sweat
- Opens into tongue
- Manifests in complexion



Kidneys (肾):

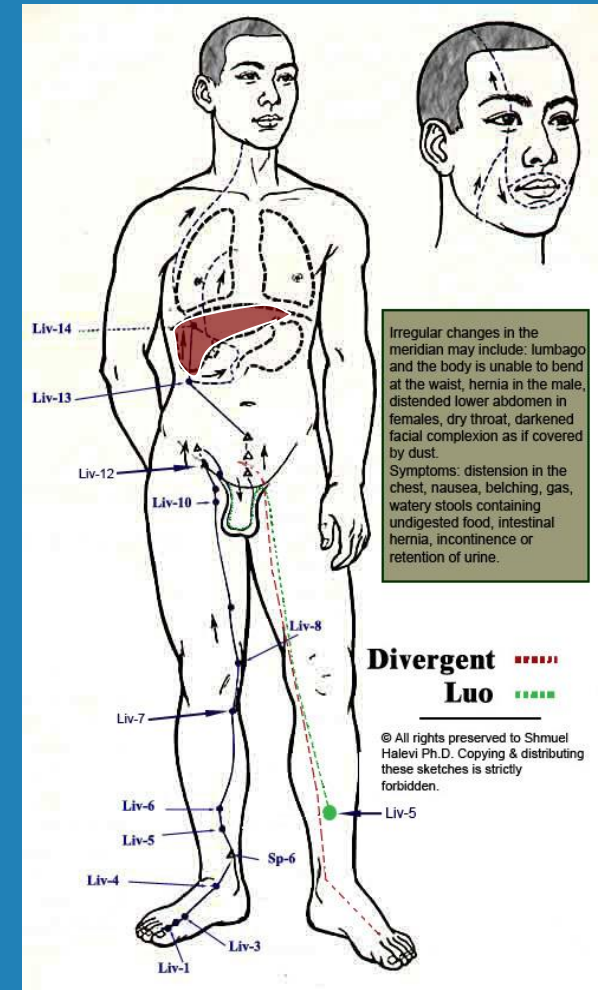
Root of life, Root of Yuan Qi

- Store Essence and govern birth, growth, reproduction and development
- Produce marrow, fill up brain and control bones
- Govern water
- Control reception of Qi
- **House Will power,**
- Open into ears and manifest in hair

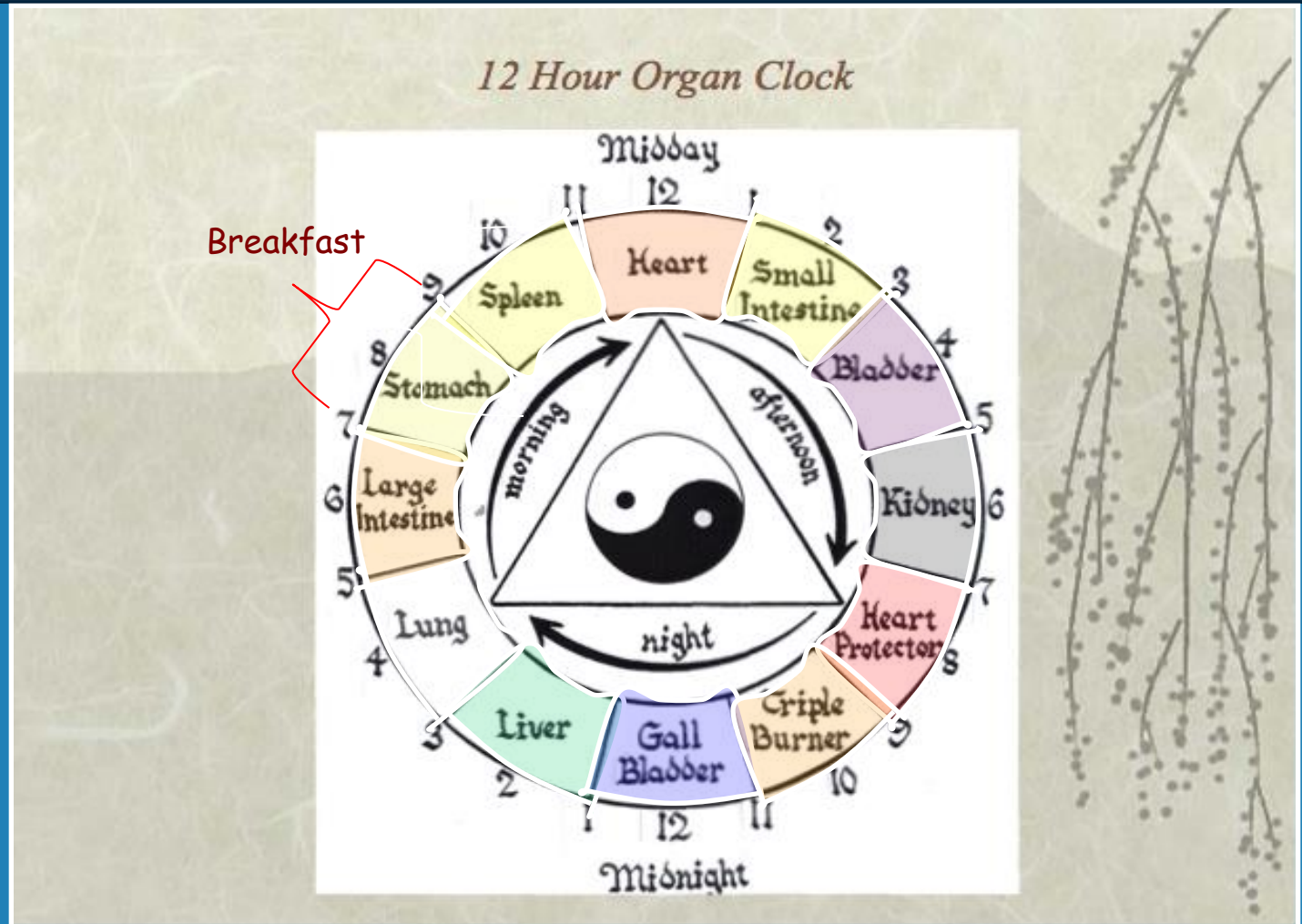


Liver(肝): The general of organs from whom the strategy is derived

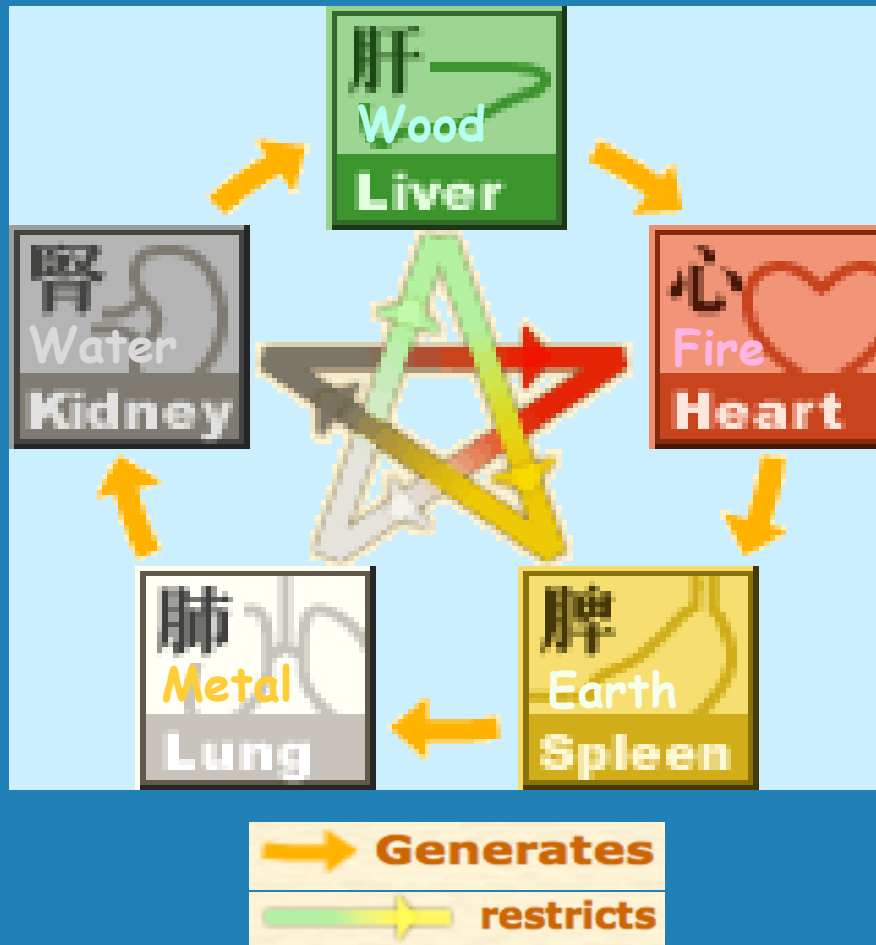
- Stores blood,
- Ensures smooth flow of Qi and blood
- Houses Ethereal Soul
- Regulating mind and mood
- Promoting digestion and absorption
- Controls sinew
- Opens into eyes
- Manifests in nails.



Peak time for each organ



Five Elements



Anger/Anxiety

ty

Insomnia

Poor appetite

Short breath

Urination disorder

Five Elements



	Wood	Fire	Earth	Metal	Water
Yin Organ	Liver	Heart	Spleen	Lung	Kidney
Yang Organ	Gall Bladder	Small Intestine	Stomach	Large Intestine	Bladder
Emotions	Anger	Joy	Pensiveness	Grief	Fear
Taste	Sour	Bitter	Sweet	Pungent	Salty
Season	Spring	Summer	Late Summer	Autumn	Winter

Acupuncture: What Conditions Commonly Treated

- Health maintenance and promotion
- Prevention—boost immune function, anti-aging, anti-oxidation...
- Complement to western medicine
- Therapeutic—
 - Chronic pain (headaches, joints, back, neck, sciatica, TGN, TMJ, arthritis pain...)
 - Emotional/mental conditions (stress, anxiety, depression, insomnia)
 - PMS, dysmenorrhea; menopausal syndromes; fertility
 - GI dysfunction
 - Cardiovascular conditions
 - Respiratory ailment (sinus allergy, asthma)
 - immunological/endocrinological conditions
- Others—sport injury, military use, cosmetic

Acupuncture: What Conditions Commonly Treated

WHO: recognizes acupuncture's common use in treating over 100 conditions.

Acupuncture: review and analysis of reports on controlled clinical trials

(WHO:
<http://www.who.int/iris/handle/10665/42414> ,
2002)



**World Health
Organization**

Randomized controlled trial studies

ClinicalTrials.gov

A service of the U.S. National Institutes of Health

Example: "Heart attack" AND "Los Angeles"

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Completed [Efficacy of Acupuncture in the Treatment of Fibromyalgia](#)

Condition: Fibromyalgia

Intervention: Procedure: Acupuncture

Funder Type: NIH

Study Completion: July 2002

First Received: February 2, 2001

Recruiting [Acupuncture for the Treatment of Insomnia](#)

Condition: Primary Insomnia

Intervention: Other: Acupuncture

Funder Type: Other / NIH

Study Completion: February 2013

First Received: March 2, 2009

Completed [Acupuncture in the Treatment of Depression](#)

Conditions: Depressive Disorders; Depression

Intervention: Procedure: Acupuncture

Funder Type: NIH

Study Completion: April 2002

First Received: February 2, 2001

Recruiting [Acupuncture in Menopause](#)

Condition: Vasomotor Symptoms

Intervention: Procedure: Acupuncture

Funder Type: Other / NIH

Study Completion:

First Received: January 11, 2011

Completed [Randomized Controlled Trial of Acupuncture for Dysmenorrhea](#)

Condition: Dysmenorrhea

Interventions: Procedure: acupuncture; Procedure: usual care

Recruiting [Brain Mechanisms of Acupuncture Treatment in Chronic Low Back Pain](#)

Conditions: Chronic Low Back Pain; Low Back Pain; Back Pain

Intervention: Procedure: Acupuncture

Funder Type: Other / NIH

Study Completion: December 2016

First Received: May 8, 2012

Individualized Treatment with Acupuncture/TCM



Insomnia

YIN

Patterns: Heart/Spleen deficiency

Symptoms: Excessive dream, hard to stay asleep, fatigue, poor memory, dizziness, pale tongue with thin coating, fine and weak pulse

Treatment: Replenish heart and spleen Promote liver qi

Patterns: Yin deficiency

Symptoms: Excessive dream, hard to stay asleep, fatigue, poor memory, dizziness, red tongue, weak thin pulse

Treatment: replenish Yin

YANG

Liver-qi stagnation

Excessive dream, hard to fall asleep, irritation, bitter taste, headache, impatience, red tongue with yellow coating, string-pulse

Liver-fire

Excessive dream, hard to fall asleep, irritation, bitter taste, headache, impatience, thin/yellow, coating, rapid string-like pulse

Clear up liver fire

How Does Acupuncture Work?

From TCM perspective:

- Unblock meridian
- Enhance "Qi"
- Modulate "Zang-Fu"
- Optimize "In" and "out"
- Balance "Yin-Yang"

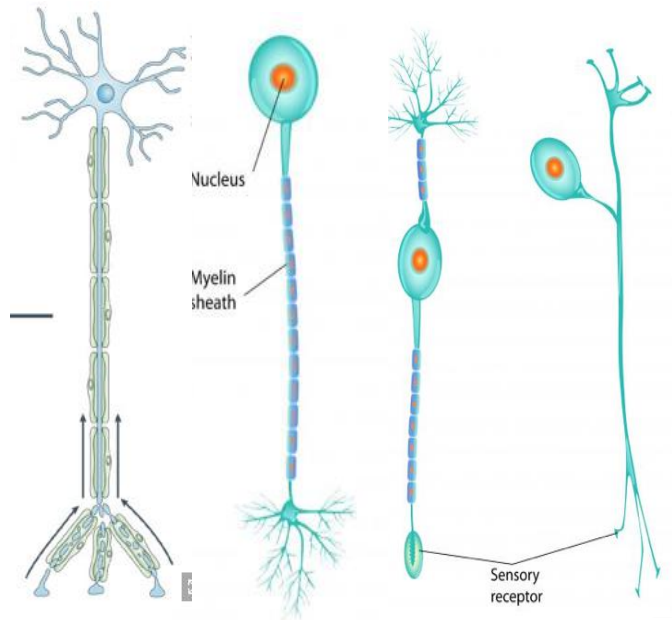
From biomedical perspective:

- Improve local condition
- Regulate nervous system
- Modulate neurotransmission
- Enhance immune function
- Regulate endocrine activity
- And more...

Overview of Acupuncture Action

--Peripheral Nervous system

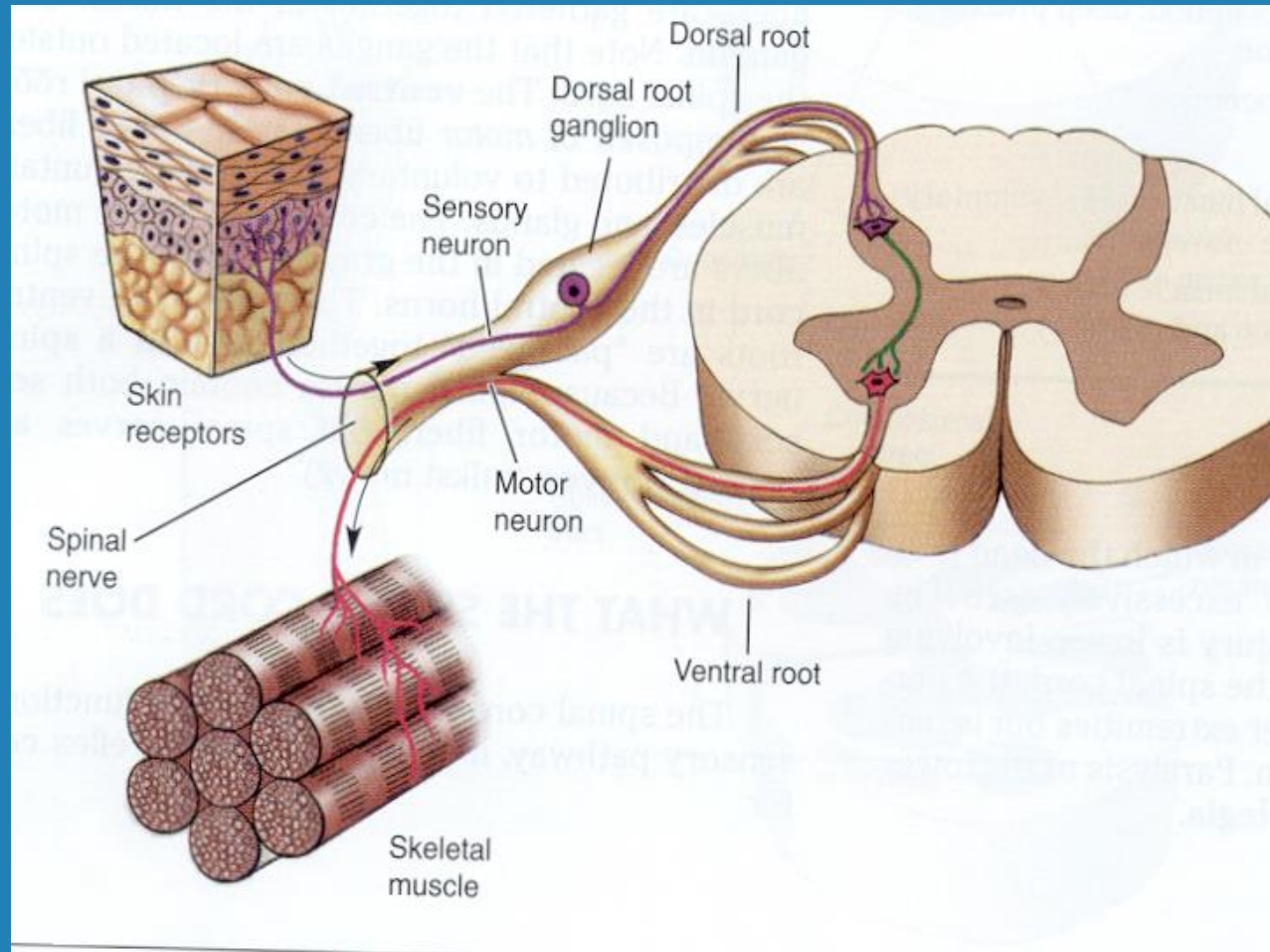
Primary Afferent Axons



Axon Type	A α	A β	A δ	C
Diameter (μm)	13-20	6-12	1-5	.2-1.5
Speed (m/s)	80-120	35-75	5-35	.5-2.0

- **A-delta fibers** - smaller, fast transmitting, myelinated fibers that transmit sharp pain
 - Mechanoreceptors - Triggered by strong mechanical pressure and intense temperature
- **C-fibers** - smallest, slow transmitting unmyelinated nerve fibers that transmit dull or aching pain.
 - Mechanoreceptors - Mechanical & Thermal
 - Chemoreceptors - Triggered by chemicals released during inflammation
- **A-alpha/beta fibers** - large diameter, fast transmitting, myelinated sensory fibers

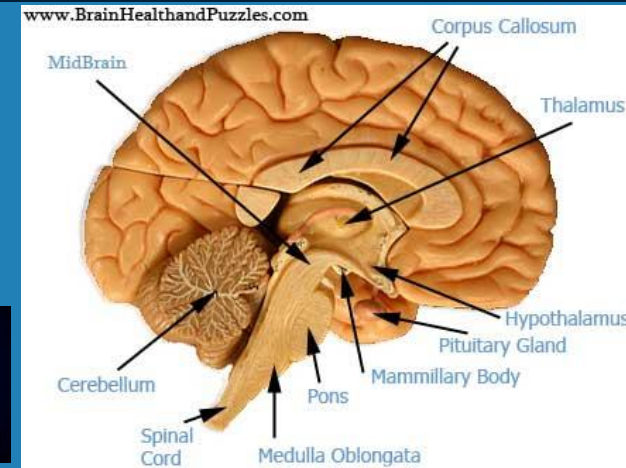
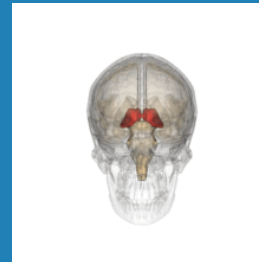
Overview of Acupuncture Action --Central Nervous system



Overview of Acupuncture Action --Central Nervous system

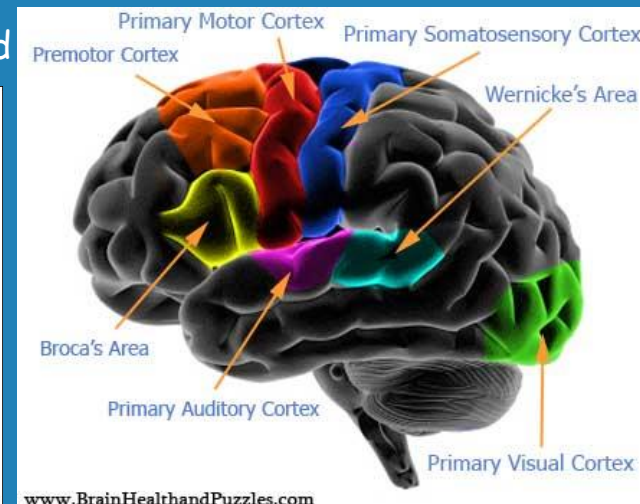
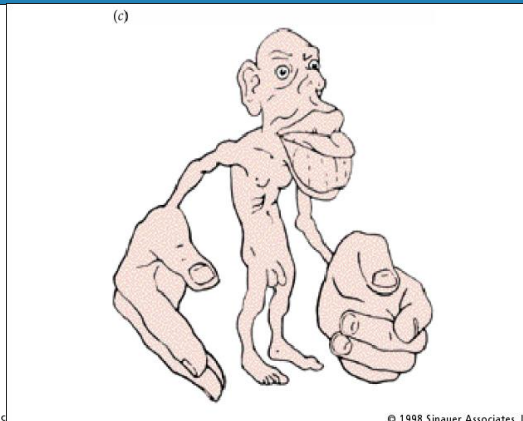
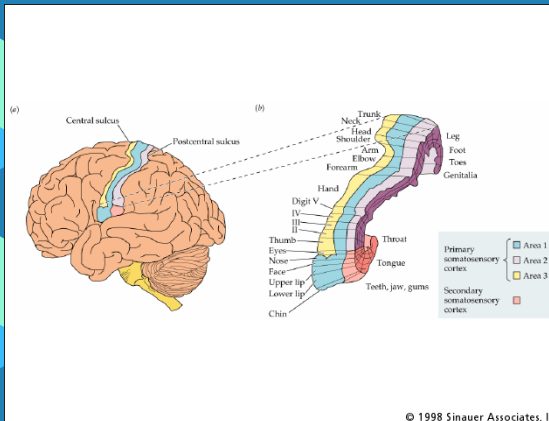
Thalamus:

- The sensory switchboard of the brain
- Located in the middle of the brain



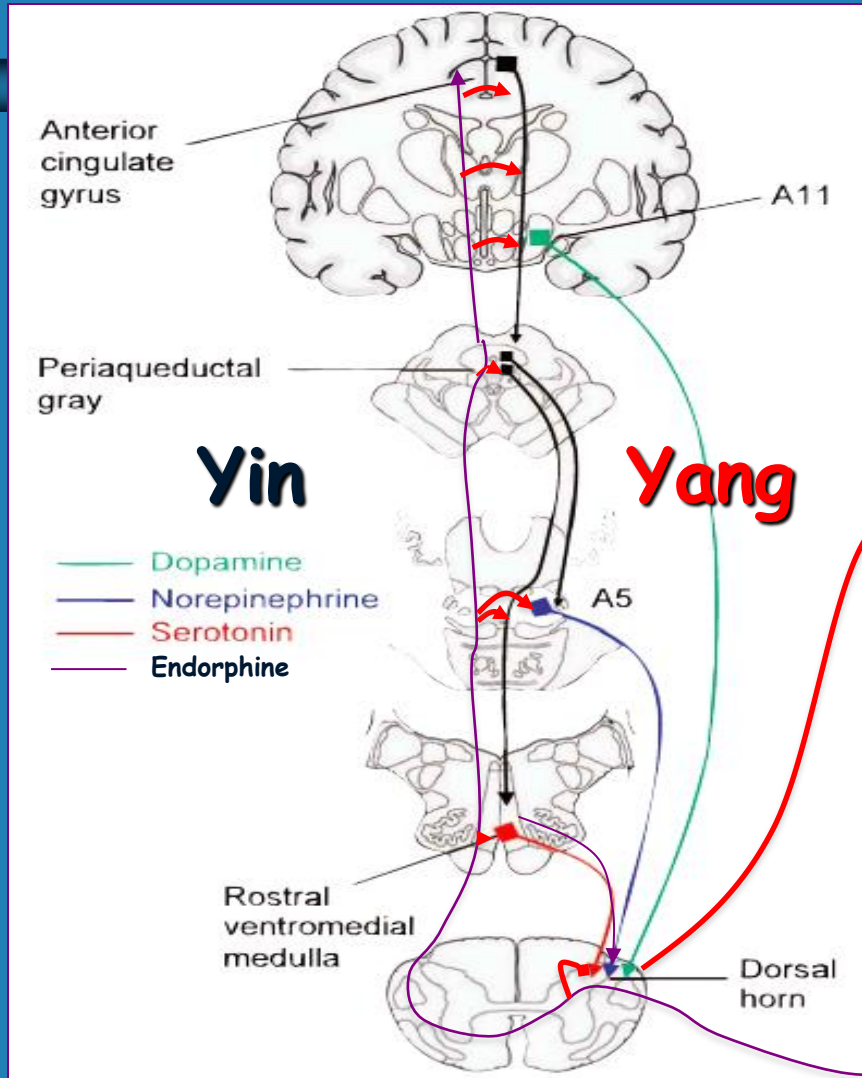
Somatosensory Cortex:



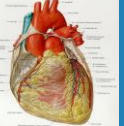


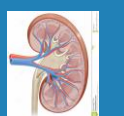
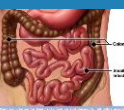
Receives all info on touch and pain. Somatotopically organized



Overview of Acupuncture Action

Yin — Yang

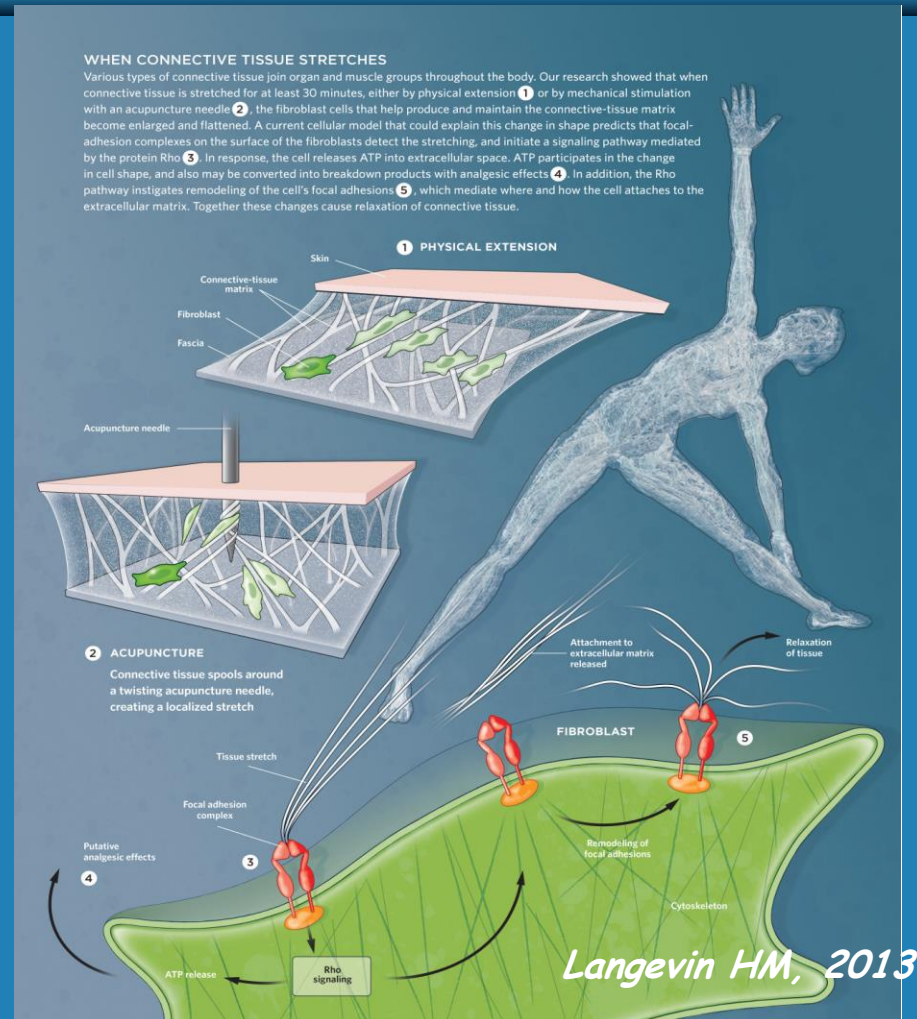
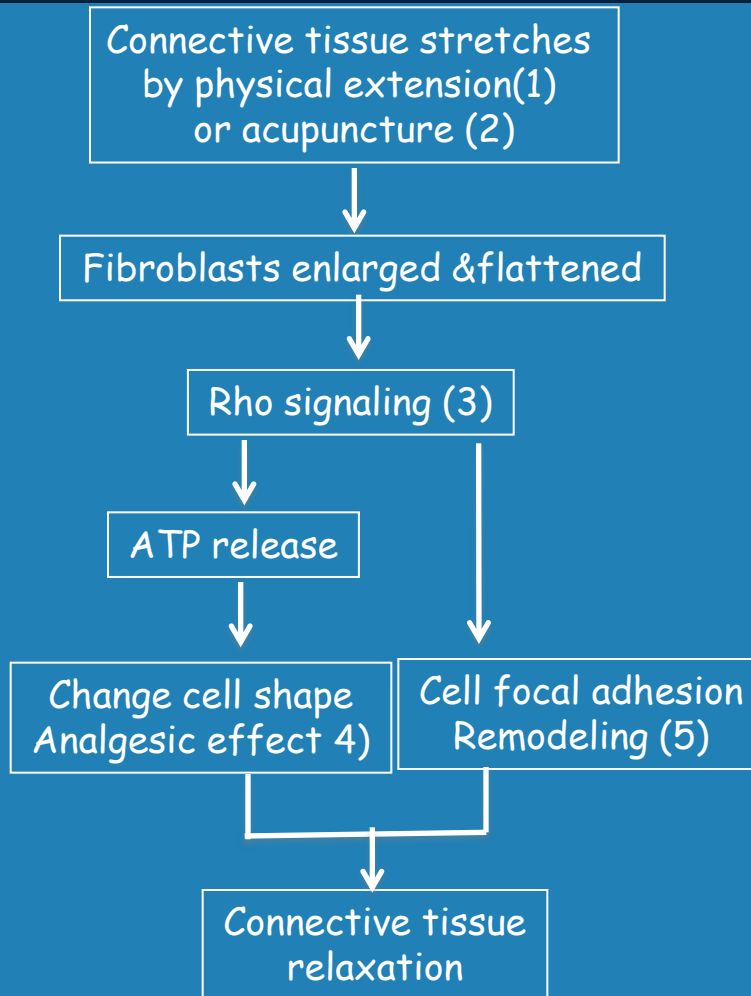


-  Soft tissues
-  nerves
Glands
-  Heart & vessels
-  lungs
-  liver
-  Kidney/bladder
-  GI

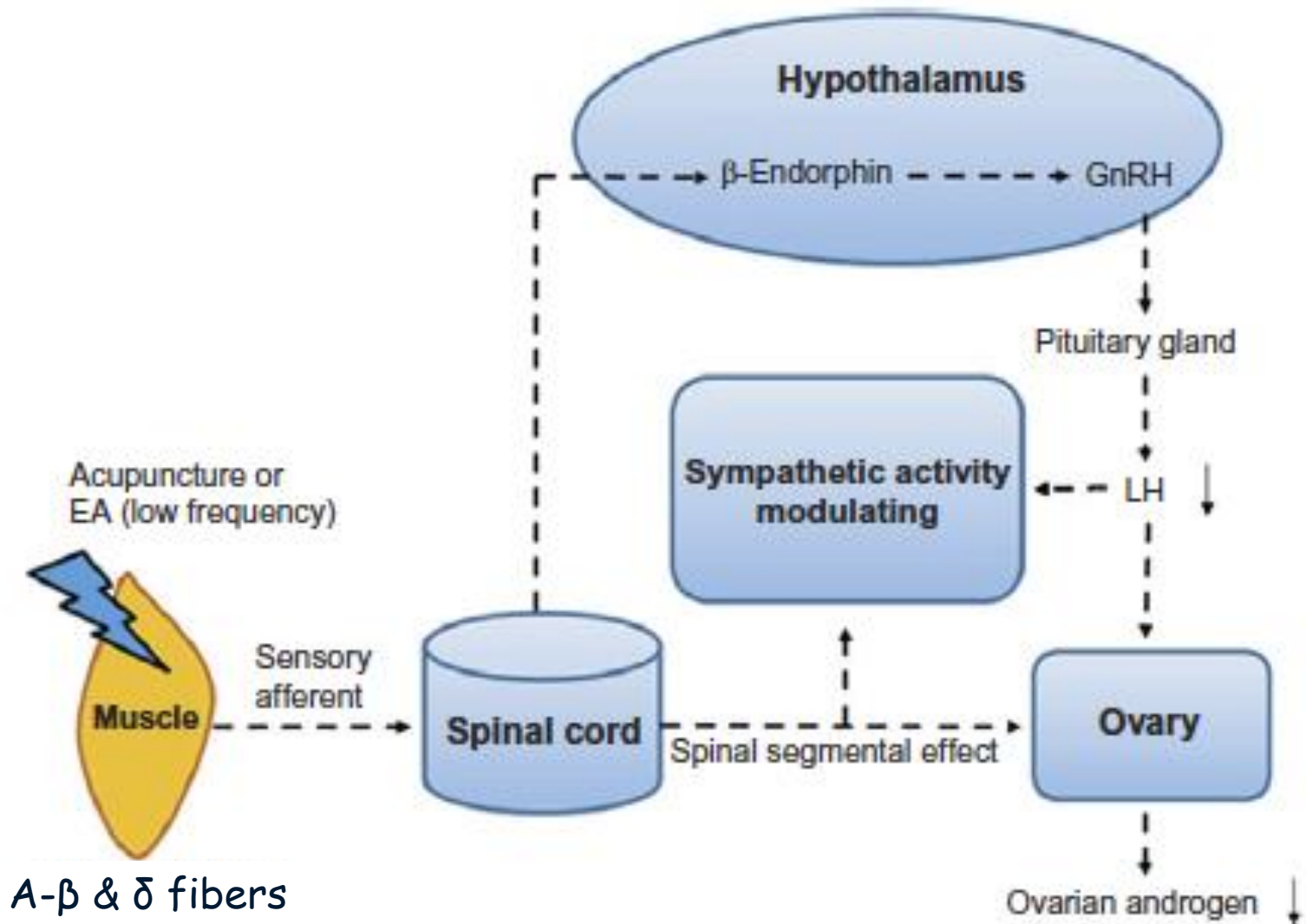


Acupuncture

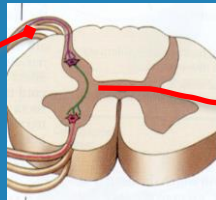
At the tip of a needle—local improvement



Acupuncture modulation on HPO/HPA axis



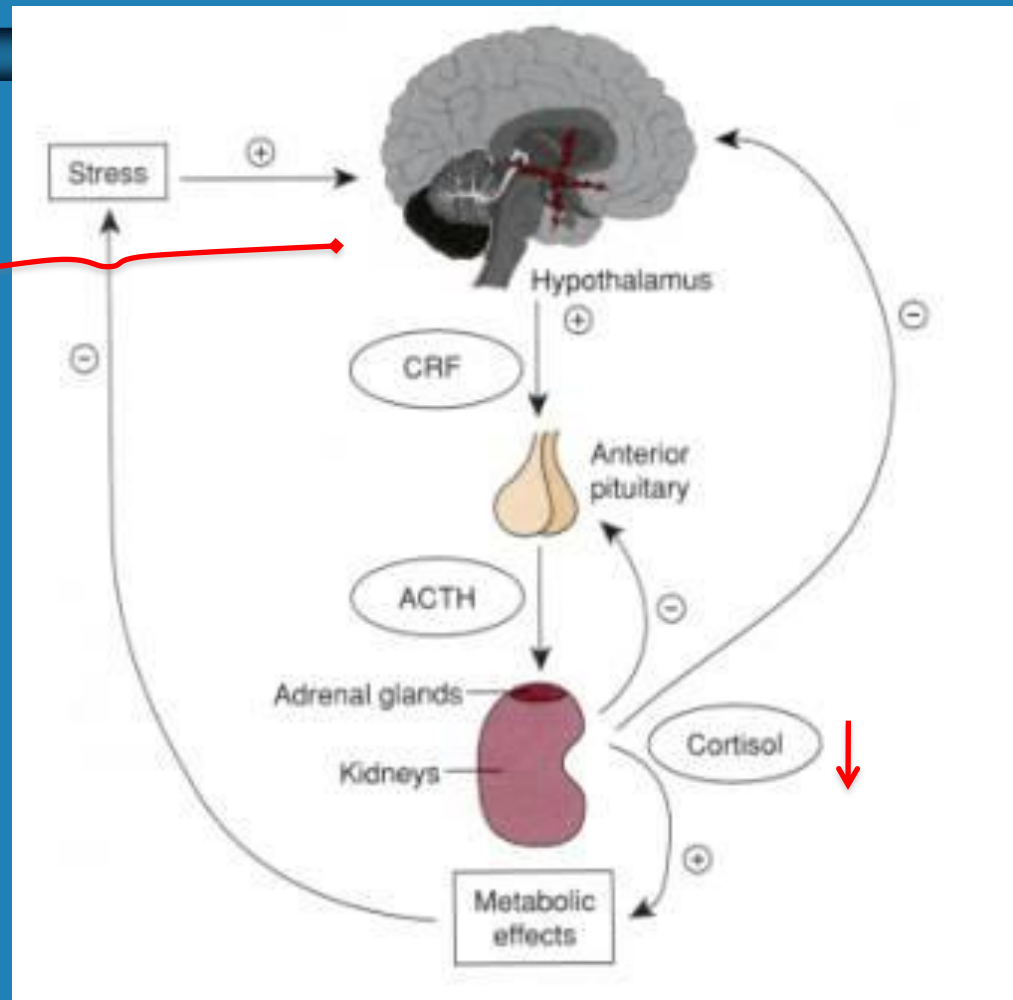
Acupuncture modulation on HPA axis



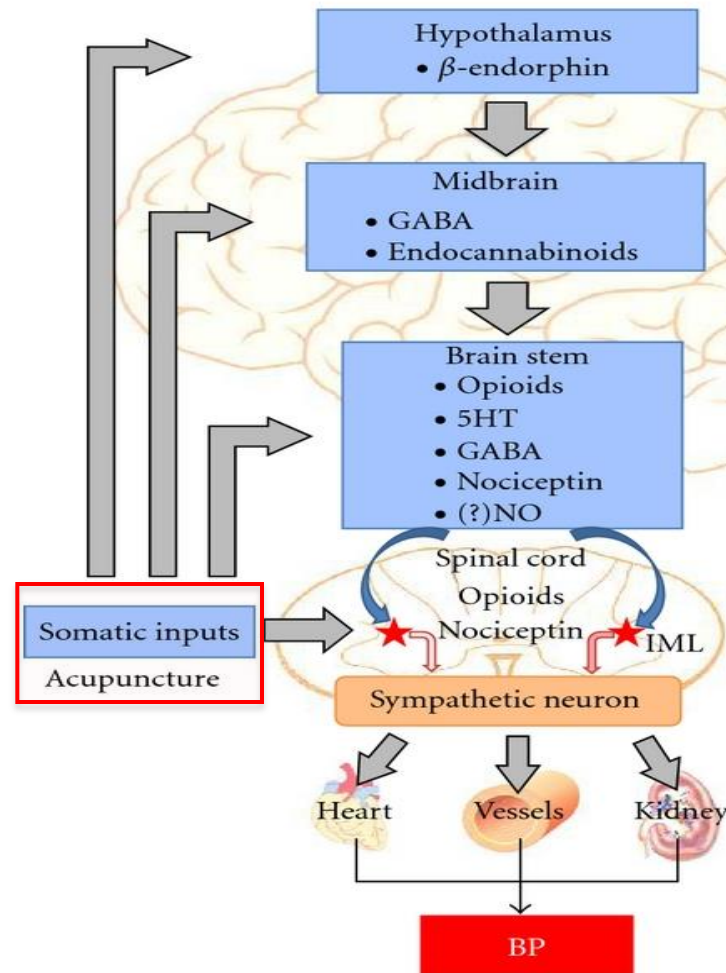
Spinal Cord



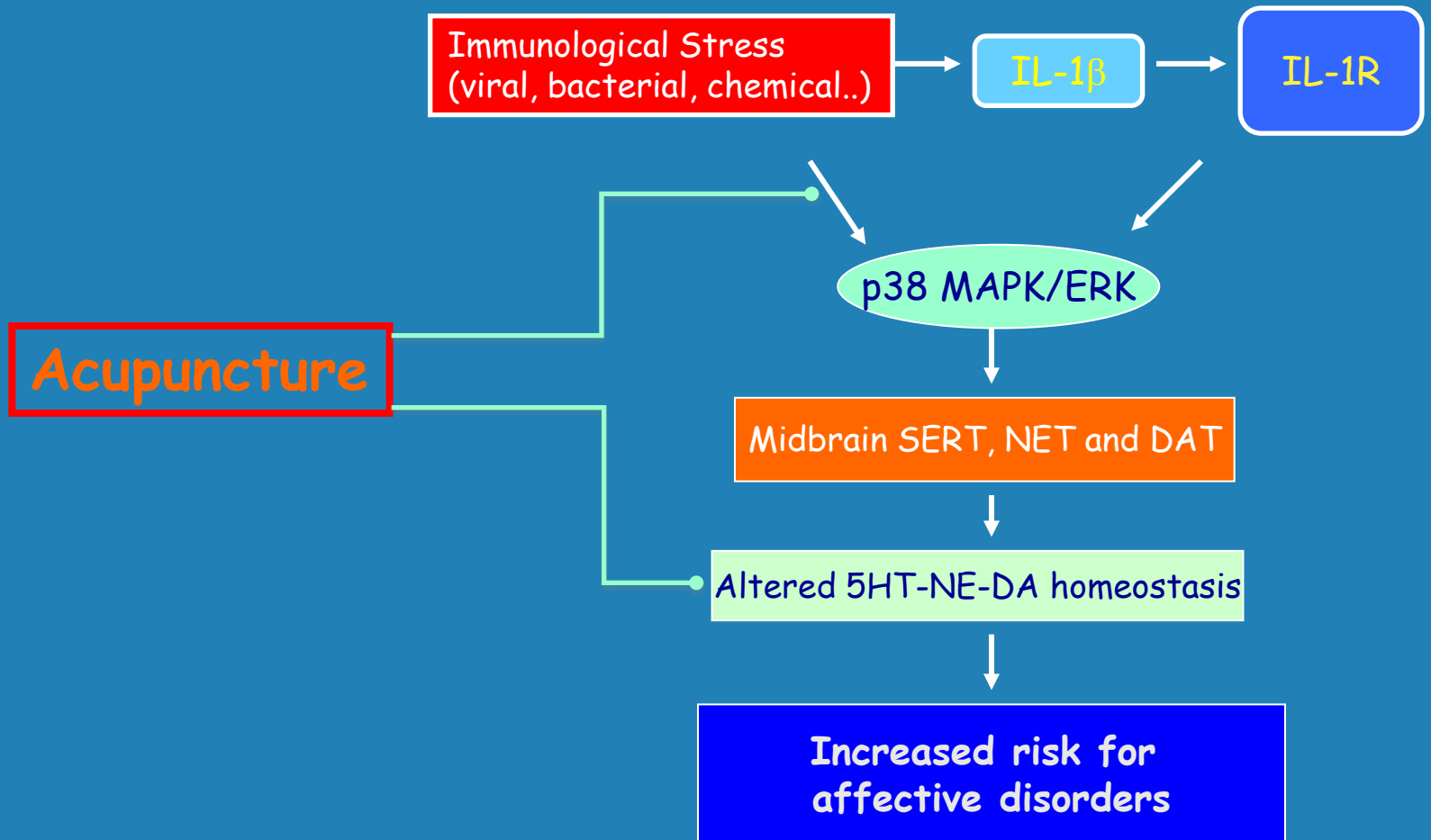
Acupuncture
A- β & δ fibers



Neuroendocrine modulation of blood pressure by acupuncture



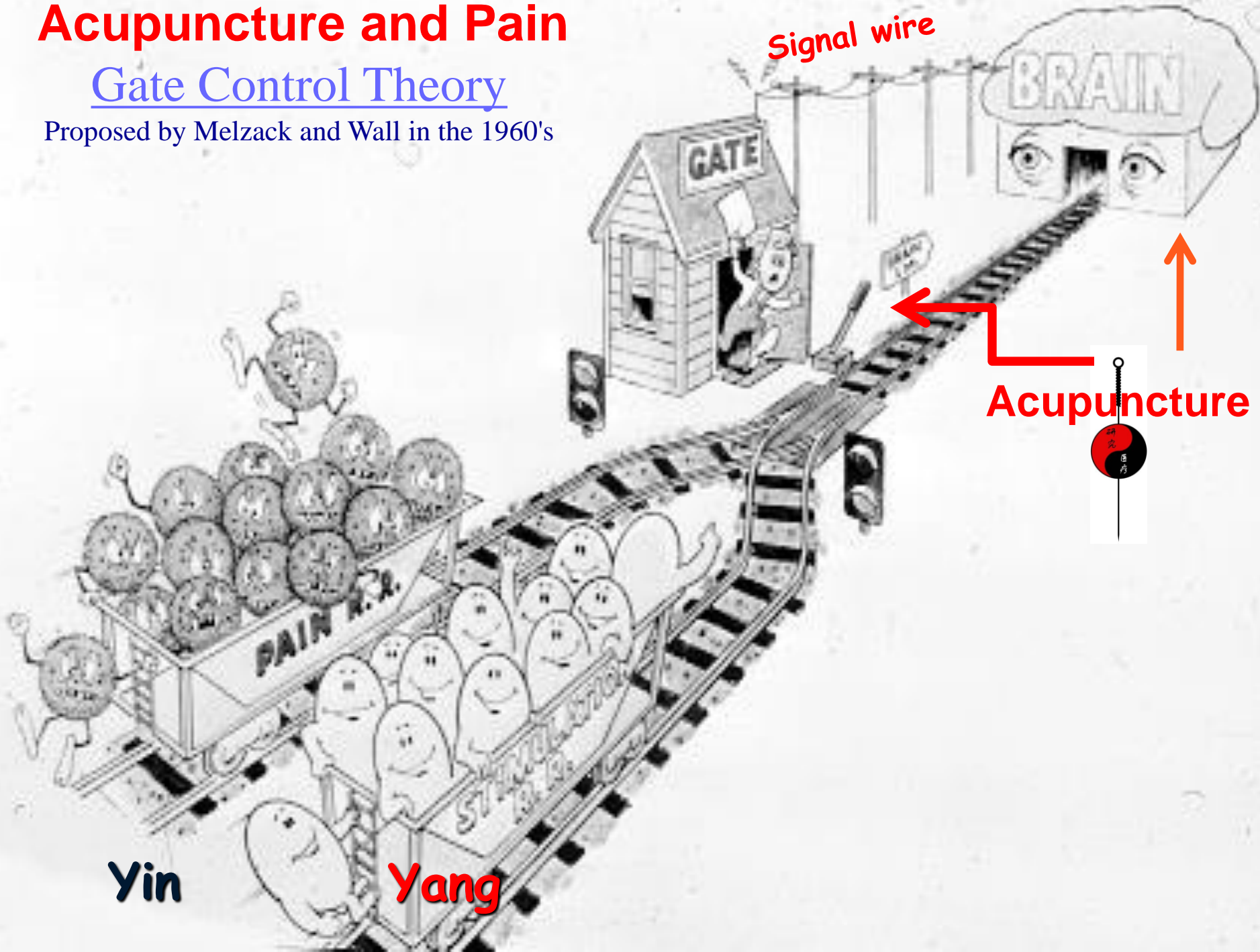
Acupuncture modulation on affective disorder via immune system and central 5HT, NE and DA



Acupuncture and Pain

Gate Control Theory

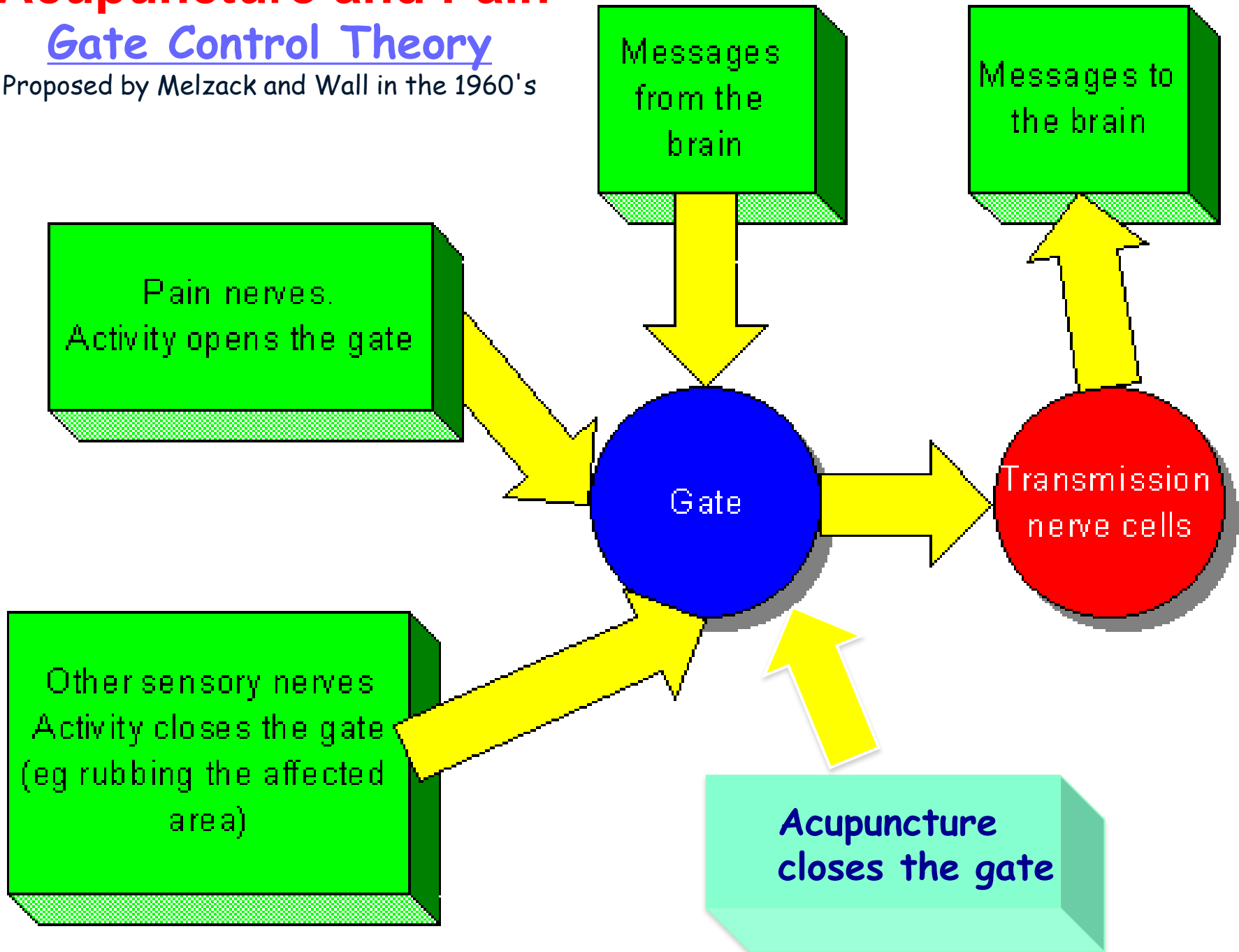
Proposed by Melzack and Wall in the 1960's



Acupuncture and Pain

Gate Control Theory

Proposed by Melzack and Wall in the 1960's



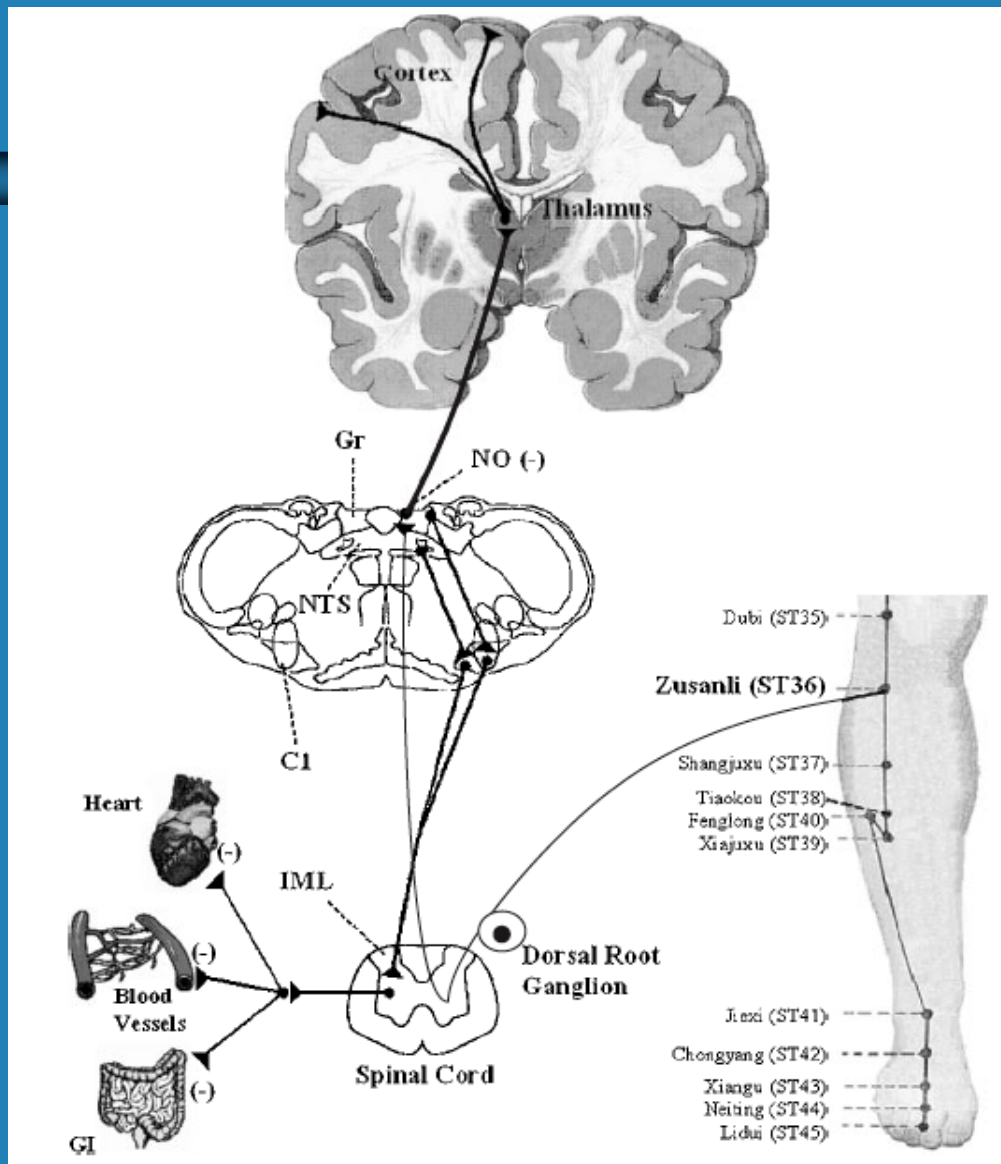
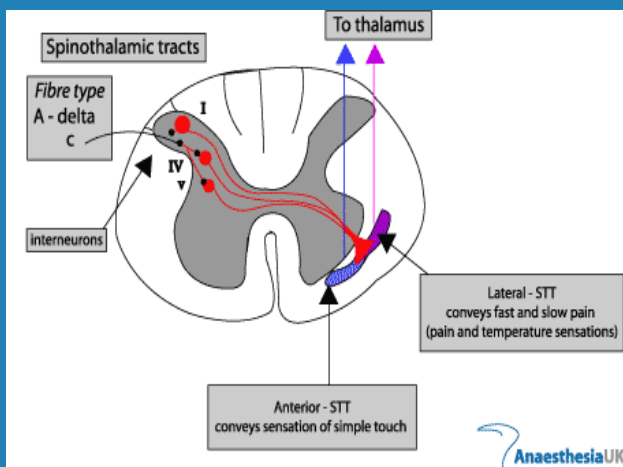
Conditions that open or close the gate

	Conditions that open the gate	Conditions that close the gate
Physical conditions	Extent of the injury	Medication
	Inappropriate activity level	Counter stimulation, eg <i>Acupuncture, massage</i>
Emotional Conditions	Anxiety or worry	Positive emotions
	Tension	Relaxation
	Depression	Rest
Mental conditions	Focusing on the pain	Intense concentration or distraction (meditation)
	Boredom	Involvement and interest in life activities

Acupuncture and Pain

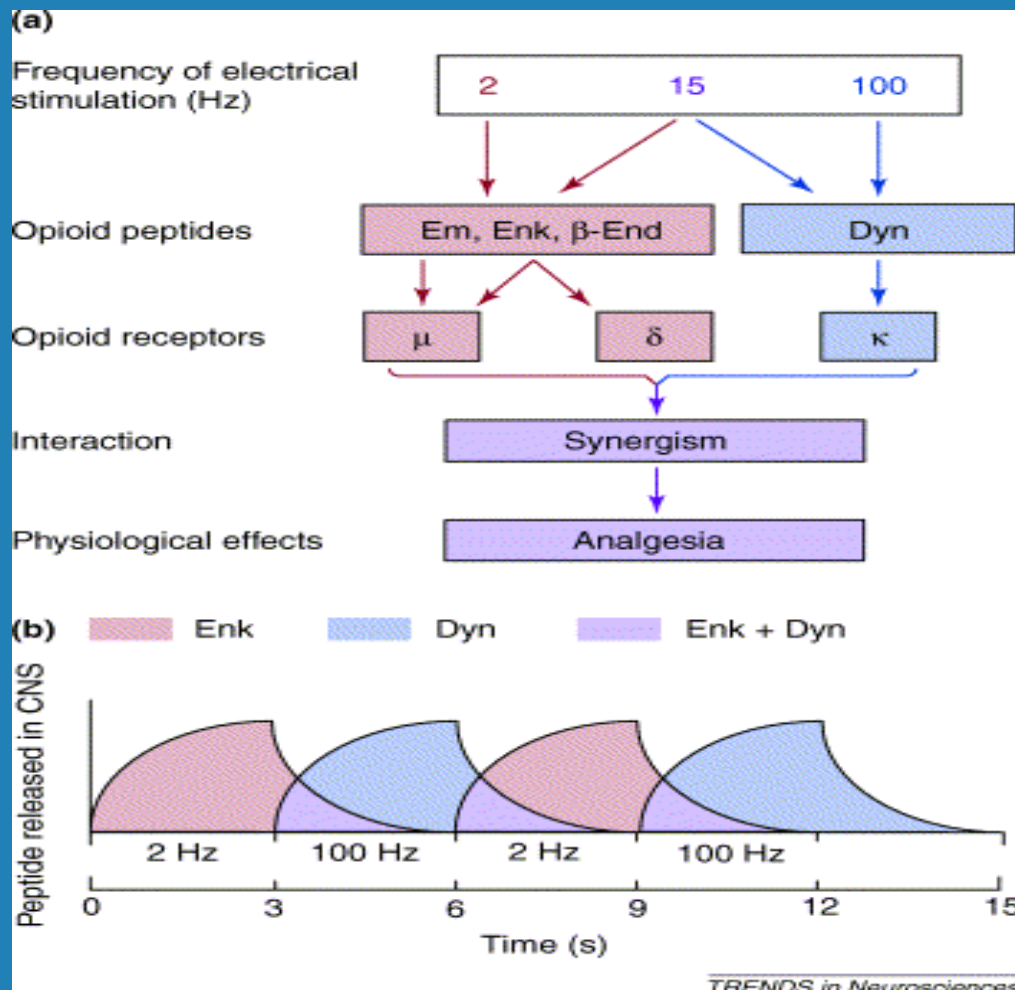
Molecules involved:

- endogenous opioid
- CCK
- 5-HT
- DA
- NE
- IL-1
- GABA
- ...



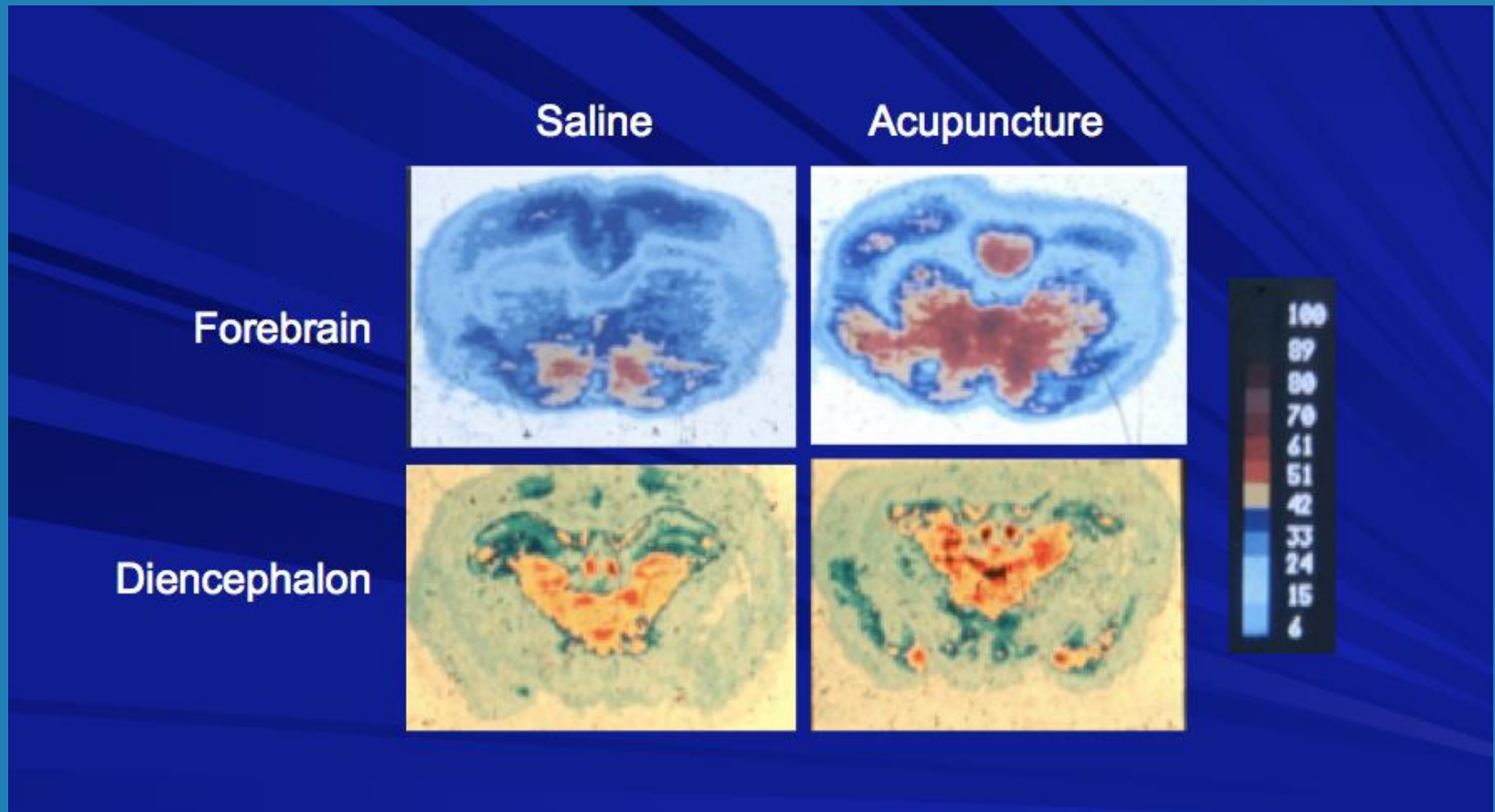
Acupuncture and Pain

Opioidergic Mechanisms for Analgesic Effect of Acupuncture



Acupuncture and Pain

Acupuncture up-regulates opioid receptor

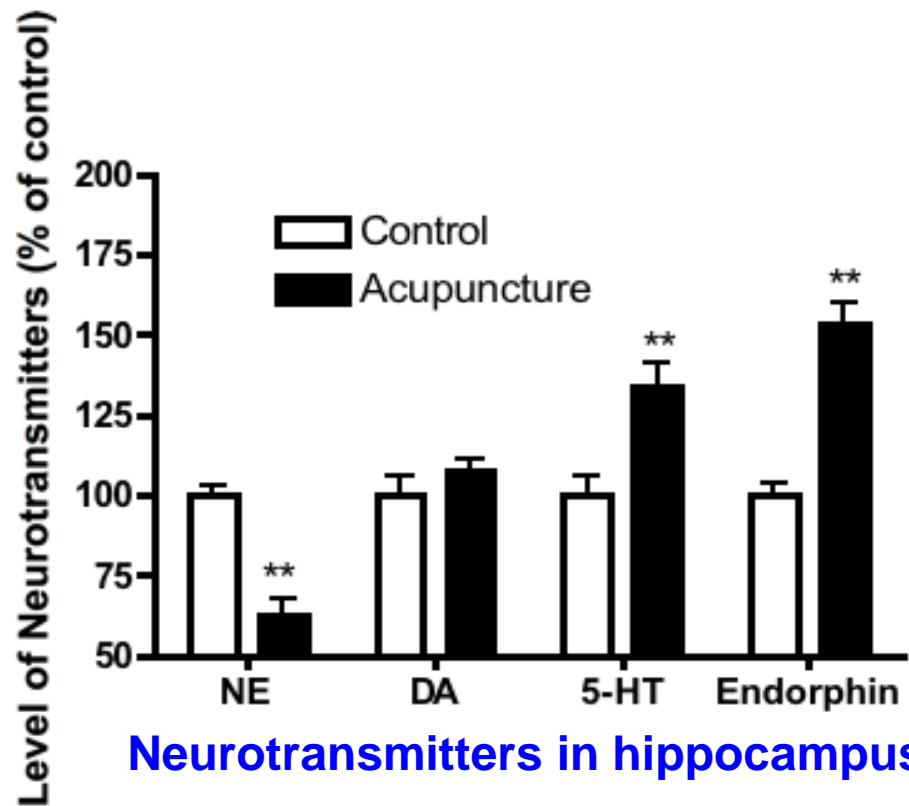


Acupuncture Analgesia

- Enkephalins & Dynorphins ☒ Spinal Cord (Substantia Gelatinosa)
- Endorphins ☒ Brainstem (Periaqueductal Gray Matter)
- 5HT ☒ Brainstem (Raphe Nuclei)

Acupuncture and Pain

Effect of Acupuncture on Brain Neurotransmitters

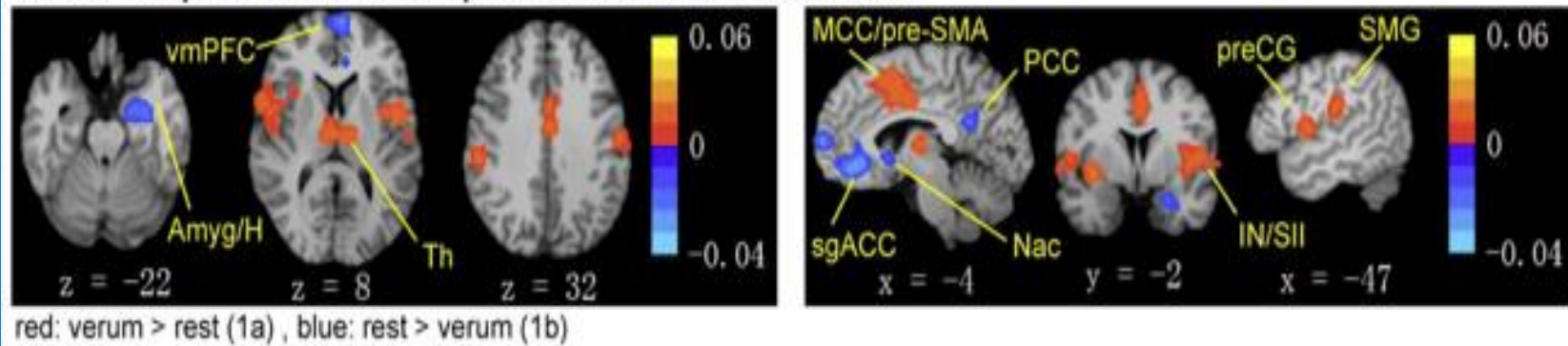


Zhu CB, 1995

Imaging Studies on Acupuncture

Systematic review and meta-analysis

A. Brain response to verum acupuncture stimuli relative to rest

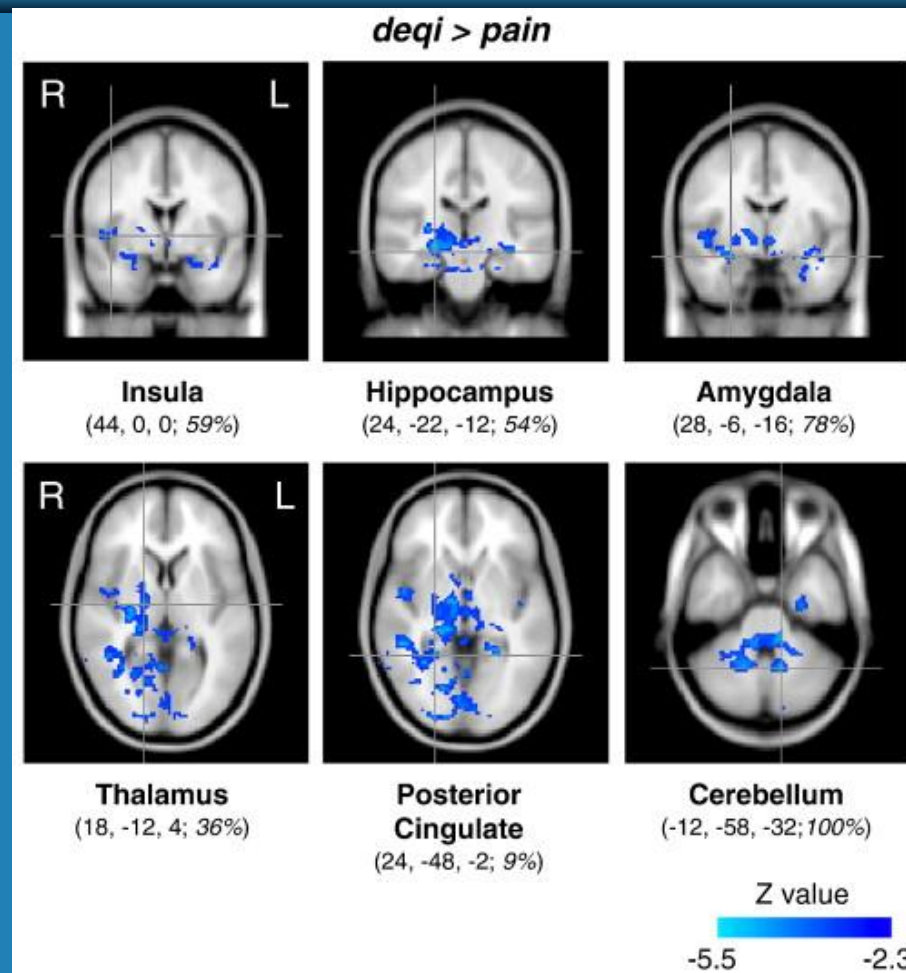


Activation: information processing and control centers--
supramarginal gyrus (language center), SII, pre-supplementary
motor area (pre-SMA), middle cingulate gyrus, insula, thalamus,
precentral gyrus

Deactivation: limbic system—amygdala, hippocampus, vmPFC,
posterior cingulate cortex (PCC).

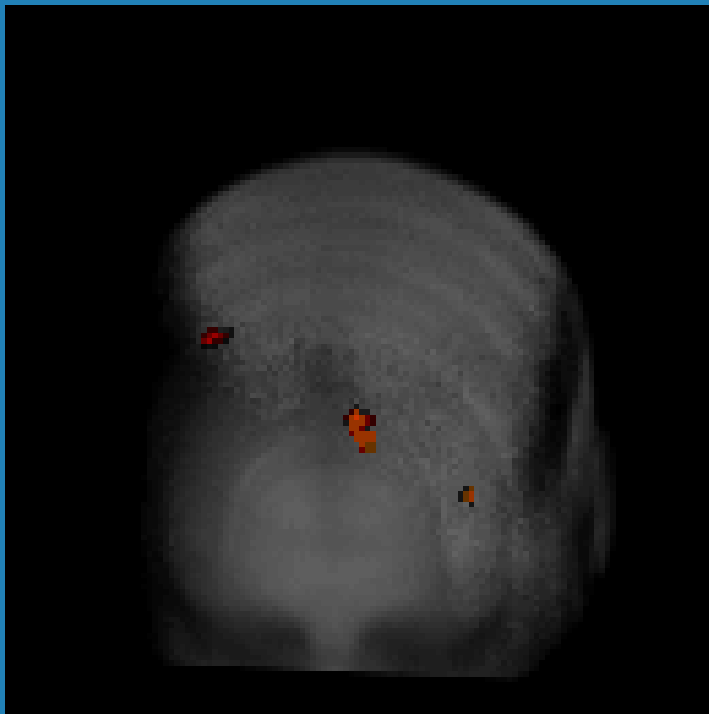
Imaging Studies on Acupuncture

"Deqi" deactivation of brain

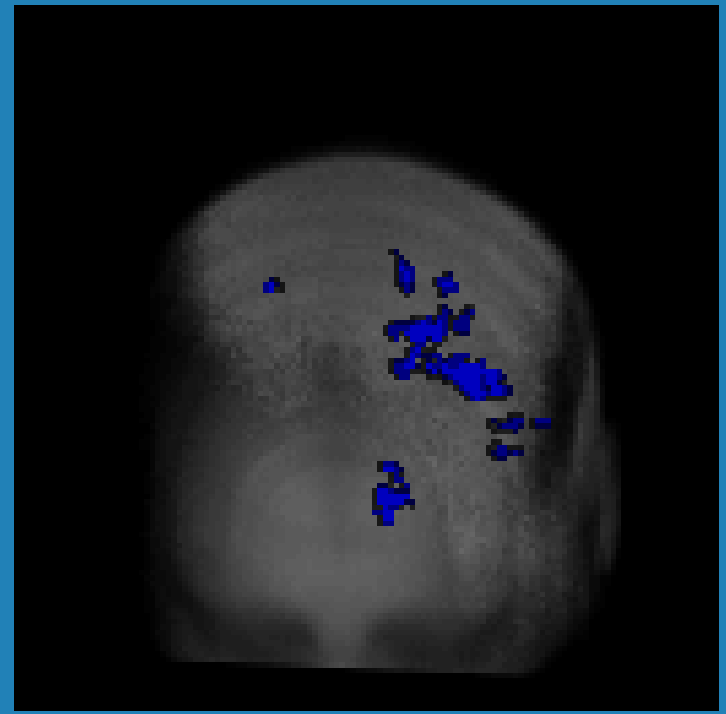


Imaging Studies on Acupuncture

Activation on Deqi

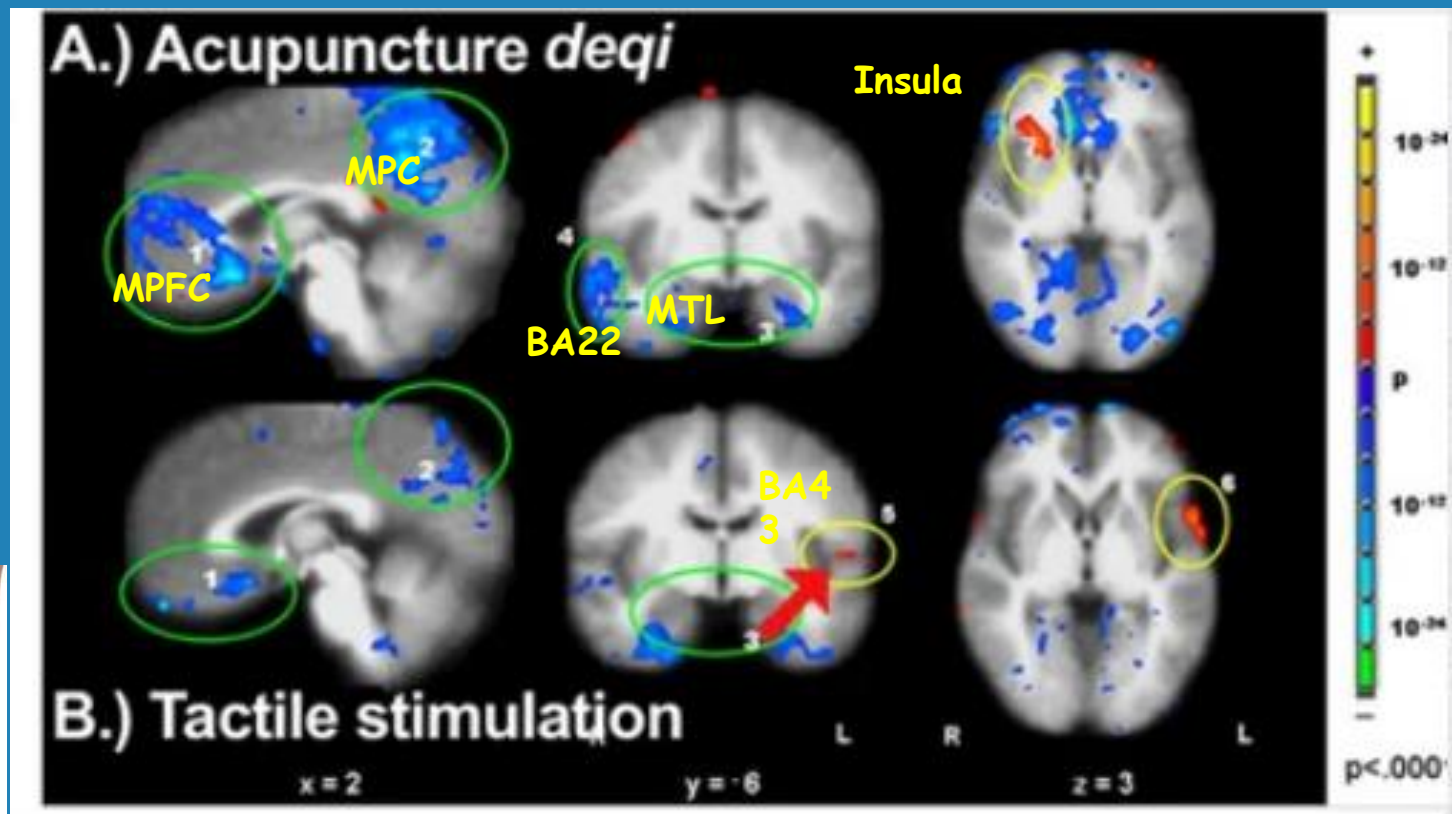


Deactivation on Deqi



Imaging Studies on Acupuncture

"Deqi" deactivation of brain

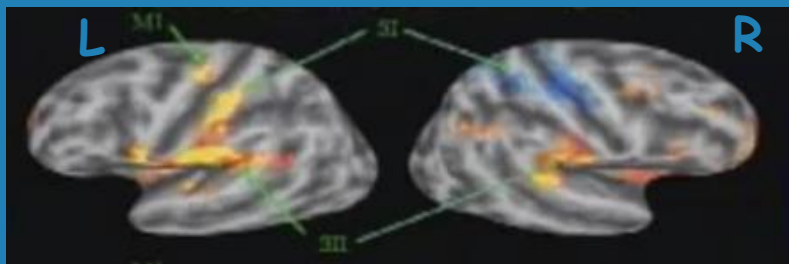


Acupoint (Liv3)

Hui KS, Napadow V, Kwong K et al. 2010, JOVE
Monitoring Acupuncture Effects on Human Brain by fMRI

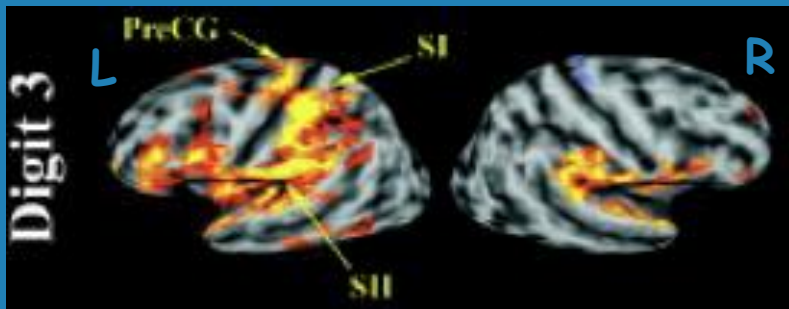
Imaging Studies on Acupuncture

carpal tunnel syndrome (CTS) treated by acupuncture

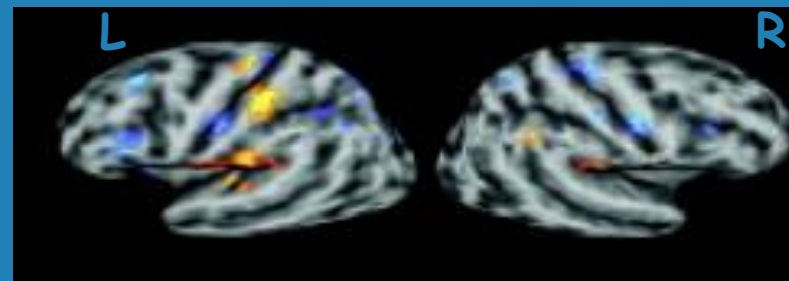


Healthy control

Napadow, V, et al., Neuroimaging, 2005

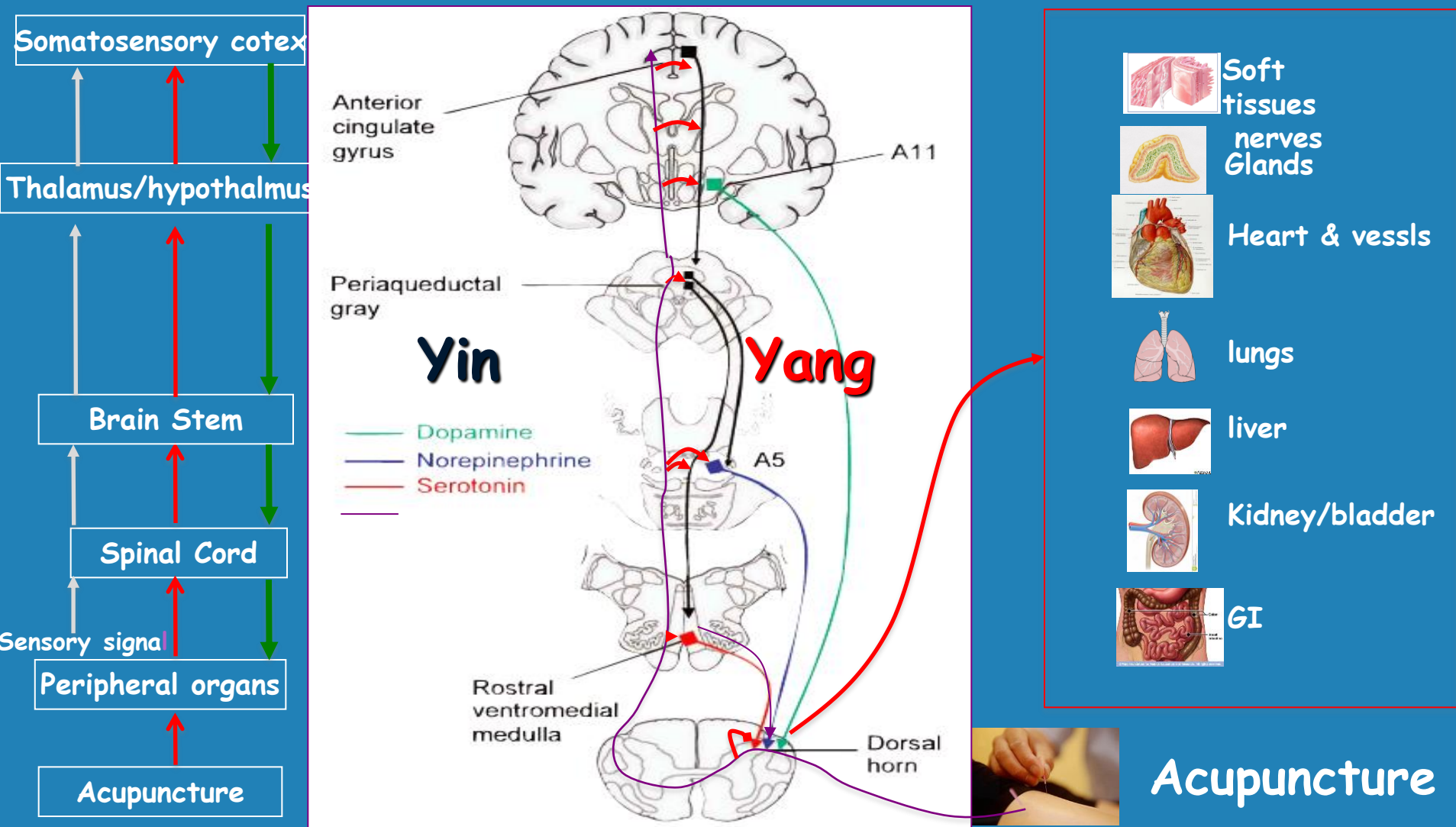


CTS: Baseline



CTS: Post-Acupuncture

Summary on how acupuncture works



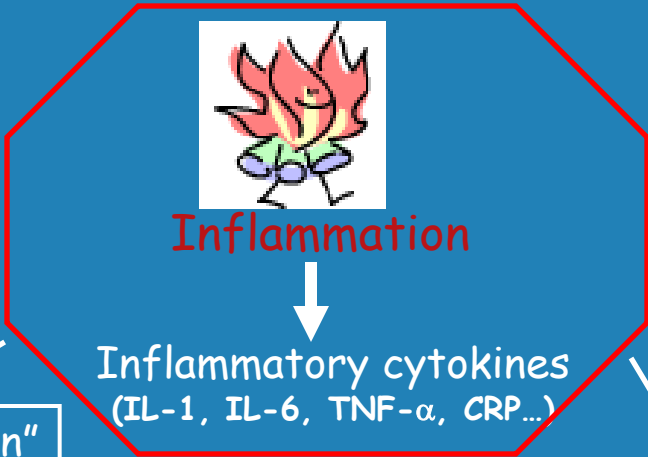
Adapted from Benarroch 2008



Stresses

Acupuncture

Infection/Irritation/Injuries...



Increase cholesterol

- Heart Disease
- High BP
- Stroke

"Switch on" oncogenes

Cancer

"Mess up" CNS

Affective disorders

- Depression
- OCD
- PTSD
- Cognitive impairment
- ...

"Chew up" Nerve cells

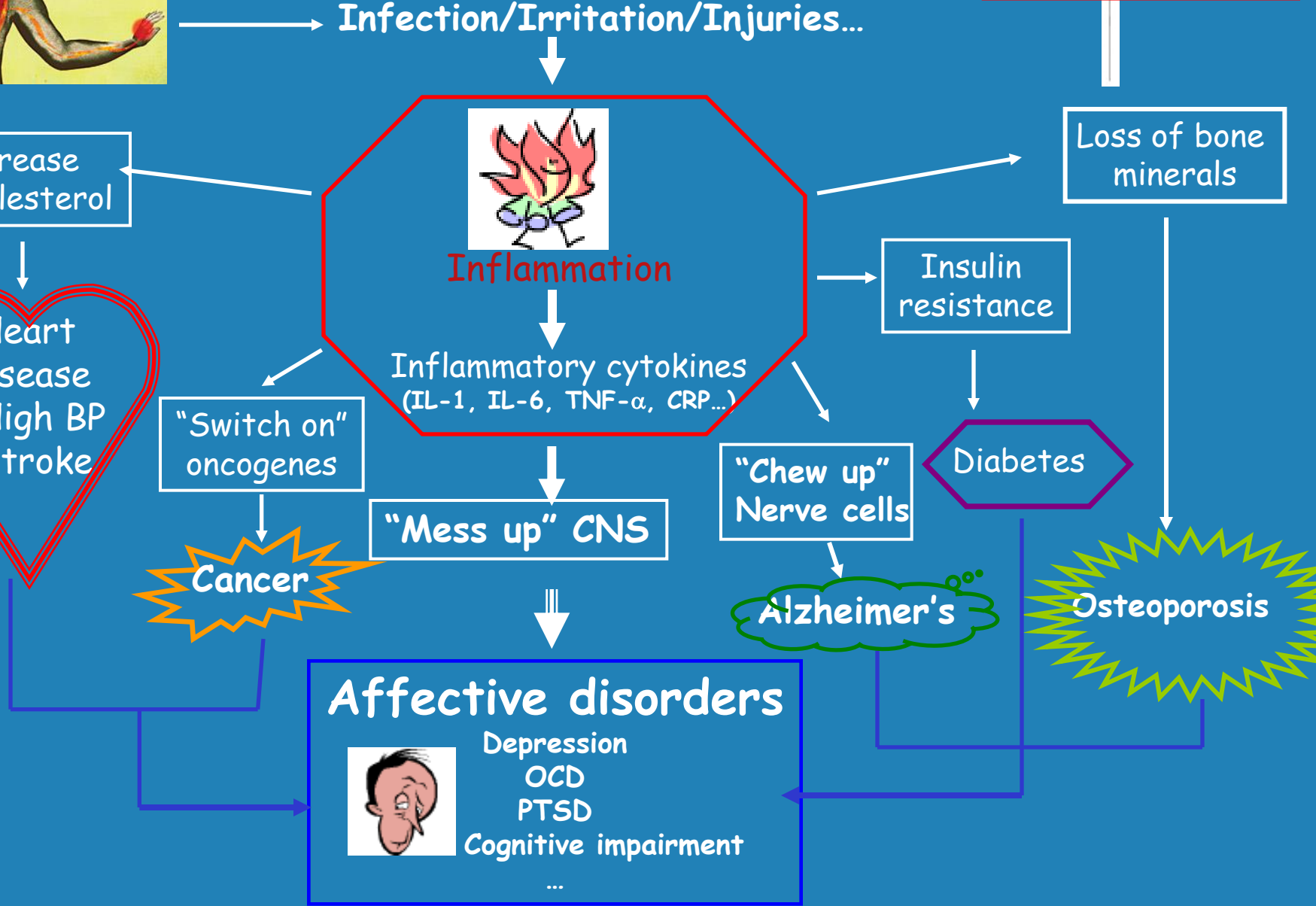
Alzheimer's

Insulin resistance

Diabetes

Loss of bone minerals

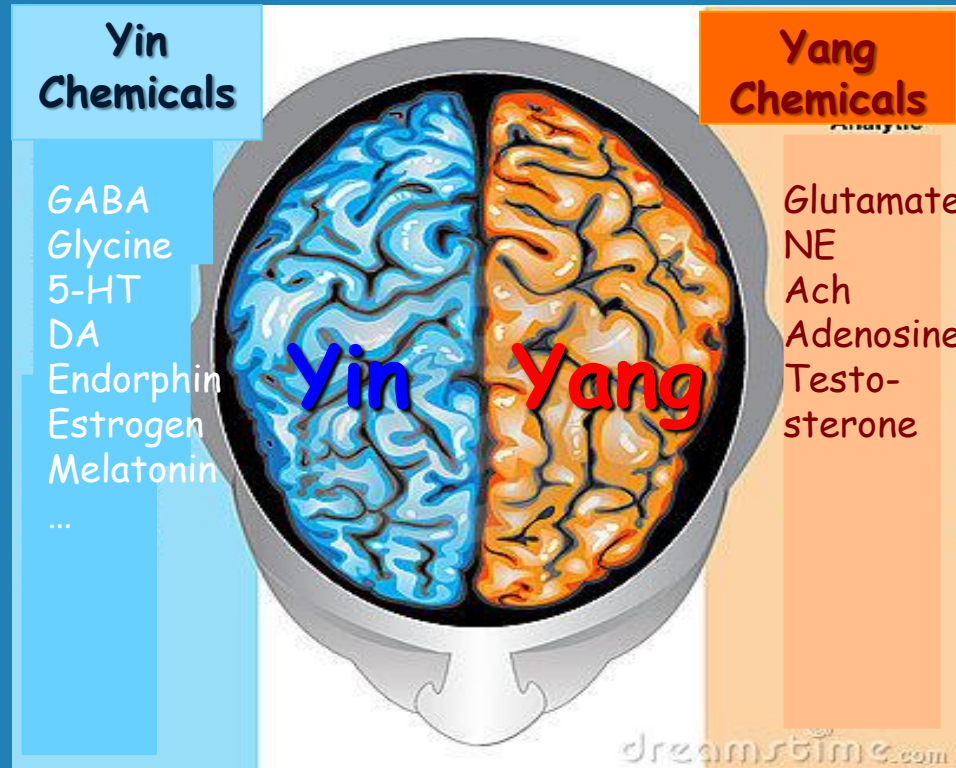
Osteoporosis



Acupuncture:



Keep Brain Yin-Yang Balanced



Keep free flow of energy
Keep body healthy
Keep life quality

