System Thinking and Clinical Reasoning in Traditional Medicine

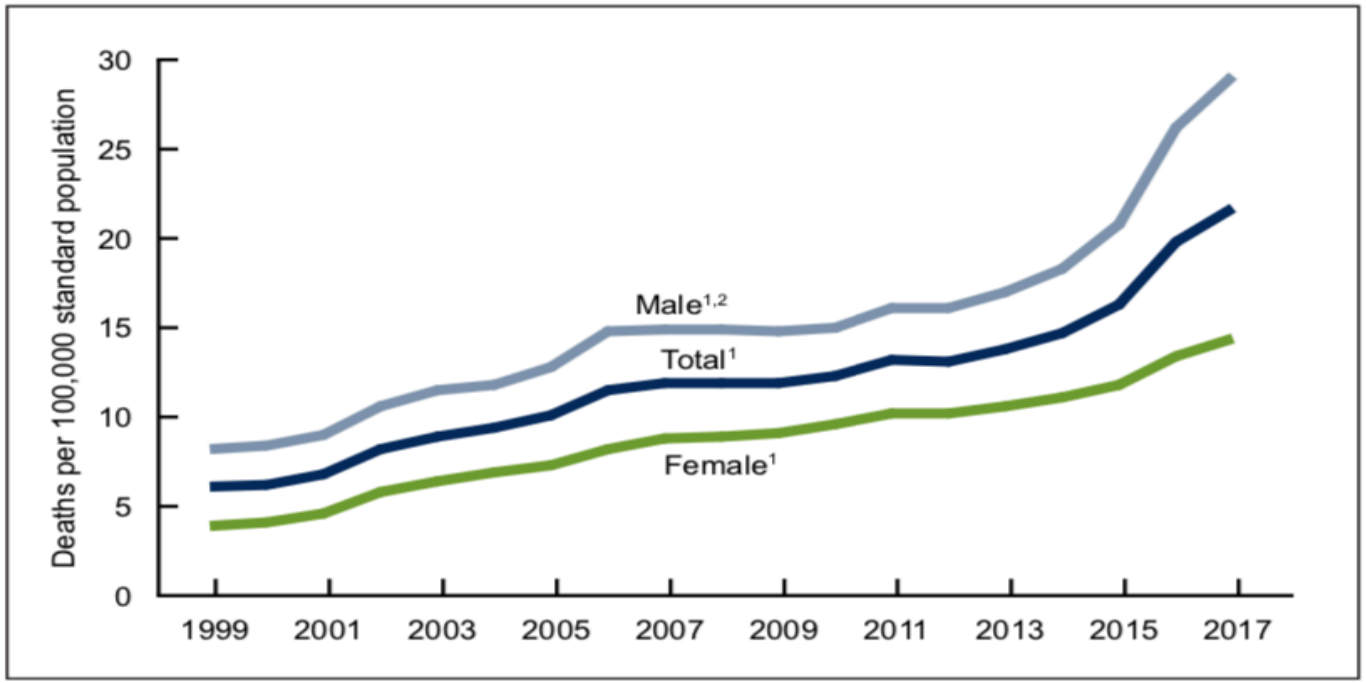
Content

- Social Needs of Acupuncture and Traditional Medicine
- Challenge of Acupuncture as a “Profession”
- System Thinking in Traditional Medicine
- Relationship with Education, Patient Care and Competency Based Medical Education
- Concept in Clinical Diagnostic Reasoning
- Unravelling Learners’ Competency Development in Clinical Diagnostic Reasoning Skill

In 2017 - 70,237 drug overdose deaths in US (9.6% higher than 2016)

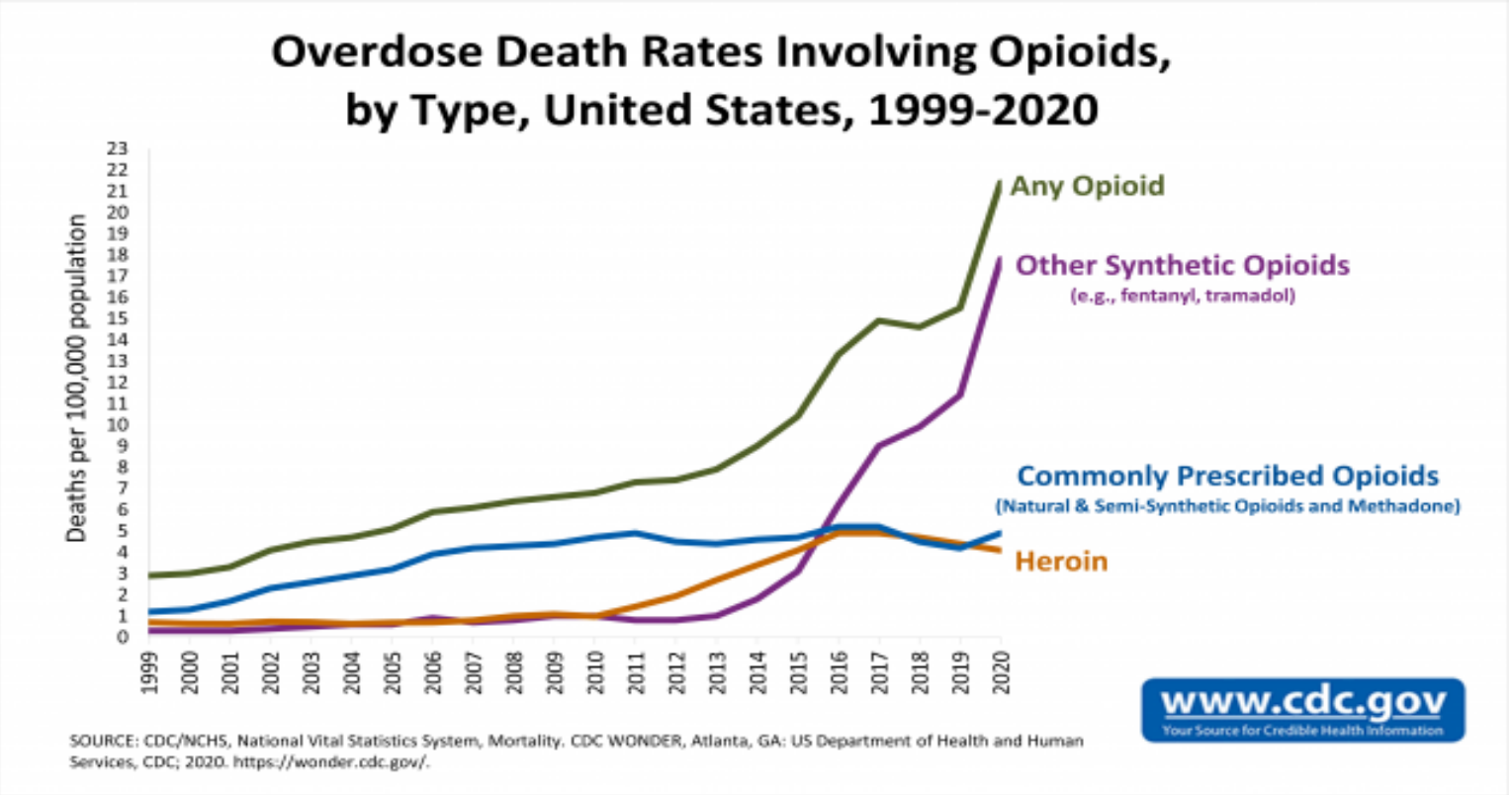
- The age-adjusted rate of drug overdose deaths increased from 6.1 per 100,000 standard population in 1999 to 21.7 in 2017
- The rate increased about 10% per year from 1999 – 2006, 3% per year from 2006 – 2014, and 16% per year from 2014 – 2017

Figure 1. Age-adjusted drug overdose death rates: United States, 1999–2017



[1]Significant increasing trend from 1999 through 2017 with different rates of change over time, $p < 0.05$.
[2]Male rates were significantly higher than female rates for all years, $p < 0.05$.
NOTES: Deaths are classified using the *International Classification of Diseases, 10th Revision*. Drug-poisoning (overdose) deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. The number of drug overdose deaths in 2017 was 70,237. Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db329_tables-508.pdf#1.
SOURCE: NCHS, National Vital Statistics System, Mortality.

https://www.cdc.gov/nchs/data/databriefs/db329-h.pdf



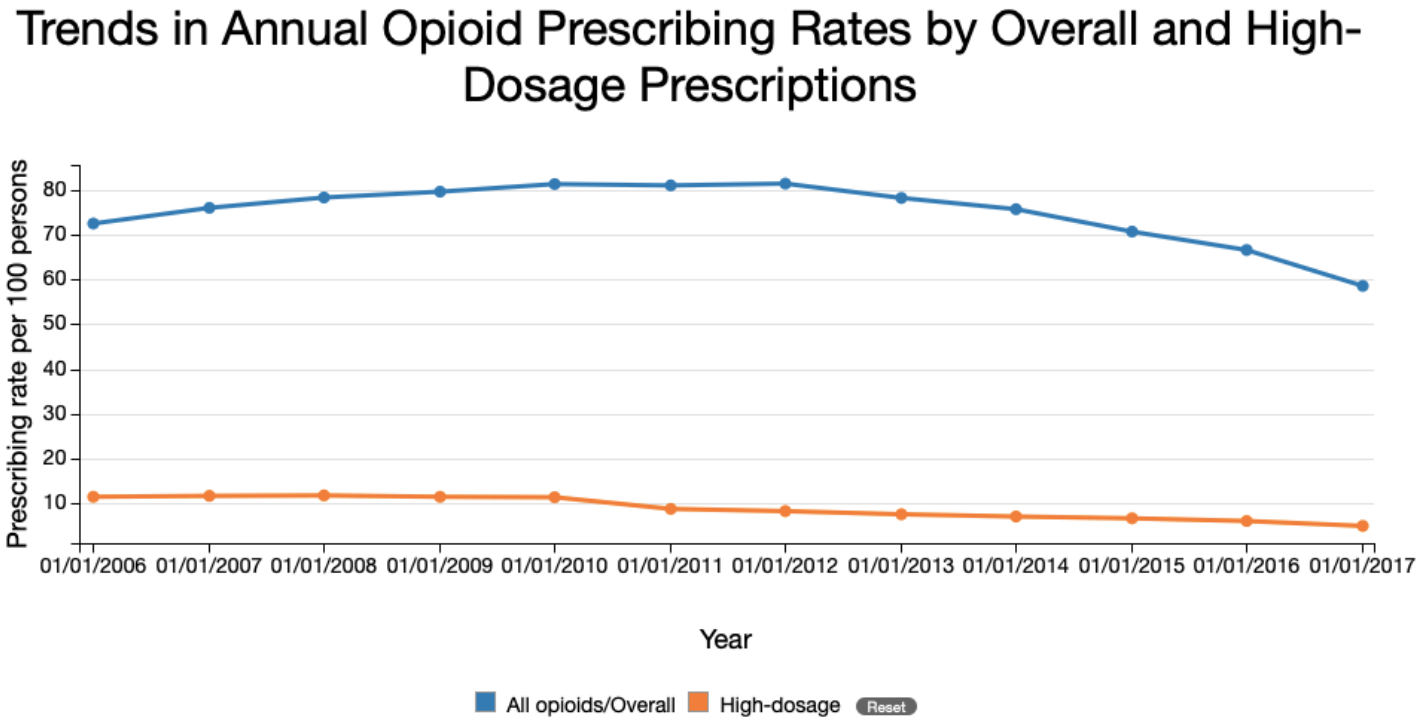
https://www.cdc.gov/opioids/data/analysis-resources.html

- Opioids were involved in > 68,000 deaths in 2020 ~ 8.5 times the number of opioid-involved overdose deaths in 1999
- 44 people die every day from overdoses involving prescription opioids

Wide-ranging online data for epidemiologic research (WONDER). Atlanta, GA: CDC, National Center for Health Statistics; 2021. Available at http://wonder.cdc.gov.
Mattson CL, Tanz LJ, Quinn K, Kariisa M, Patel P, Davis NL. Trends and Geographic Patterns in Drug and Synthetic Opioid Overdose Deaths — United States, 2013–2019. MMWR Morb Mortal Wkly Rep 2021;70:202–207. DOI: http://dx.doi.org/10.15585/mmwr.mm7006a4

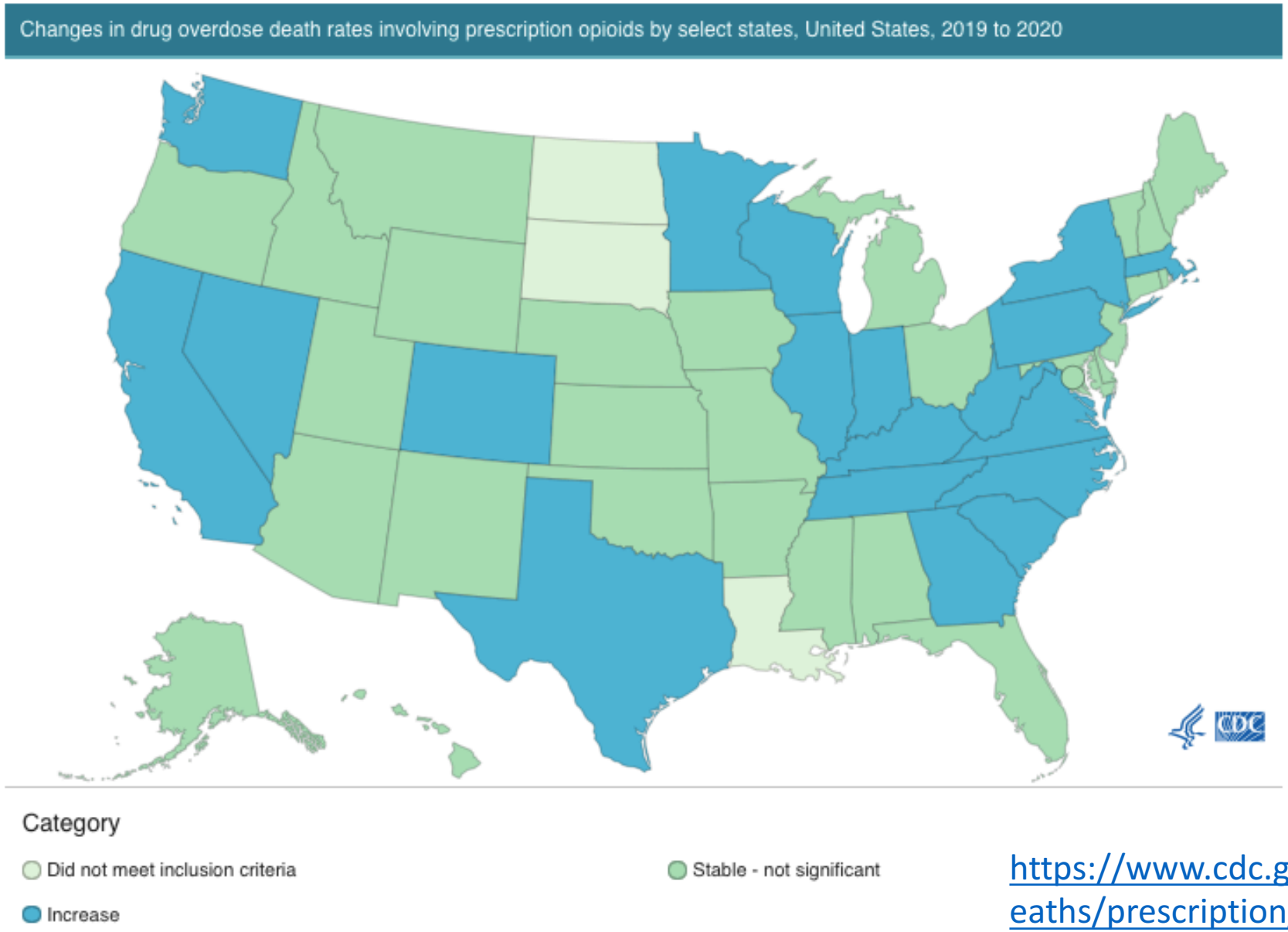
Opioids Prescribing Rates

- Overall opioid prescribing rate in US leveled off 2010 – 2012
  - Amount of opioids in Morphine Milligram Equivalents (MME) prescribed per person 3x higher than 1999
- 19% reduction in annual prescribing rate (2006 – 2017)
  - High-dose prescribing rates (≥90 MME) since 2008 and declining of opioid prescribing rates since 2012 → Cautious in opioid prescribing practices



https://www.cdc.gov/drugoverdose/deaths/prescription/practices.html

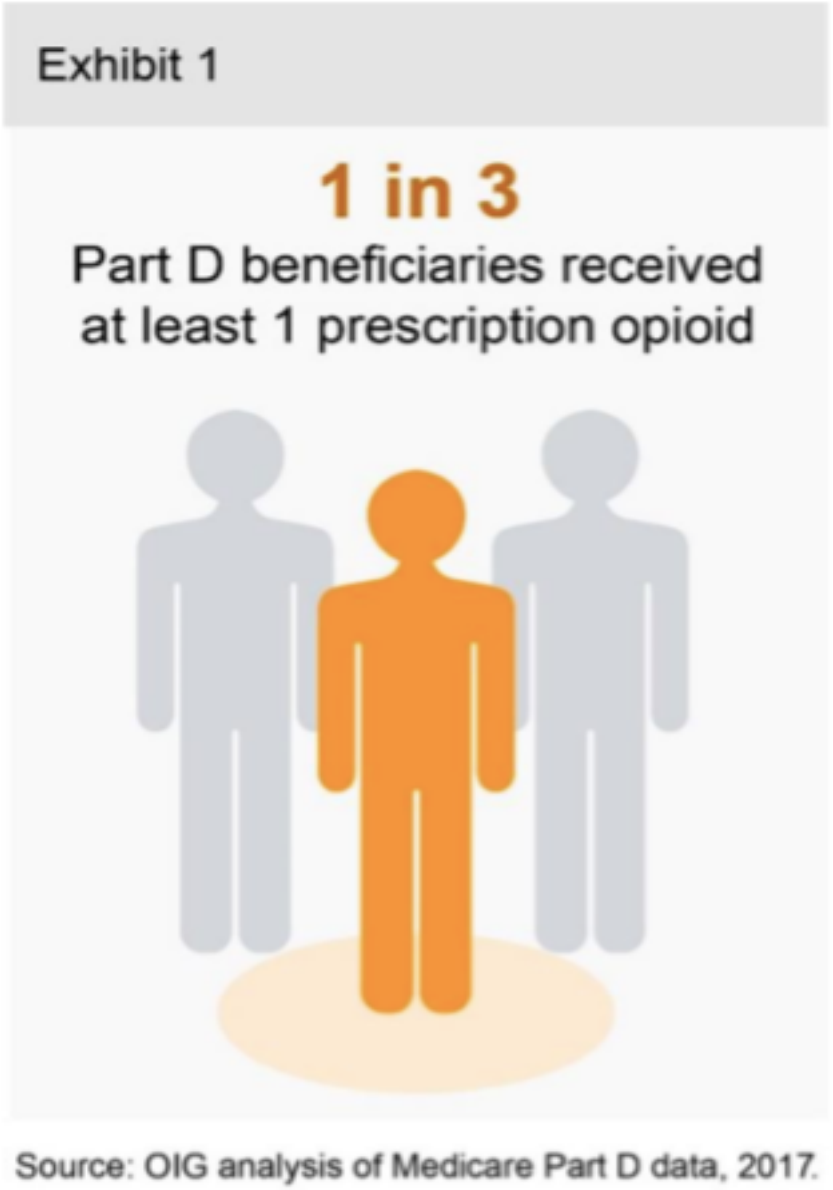
2019-2020



https://www.cdc.gov/drugoverdose/deaths/prescription/2019-2020.html

From US HHS Data 2017

- About 500,000 beneficiaries received high amounts of opioids
- Almost 90,000 beneficiaries are at serious risk (some received extreme amounts of opioids, others appeared to be doctor shopping)
- About 400 prescribers had questionable opioid prescribing patterns for beneficiaries at serious risk



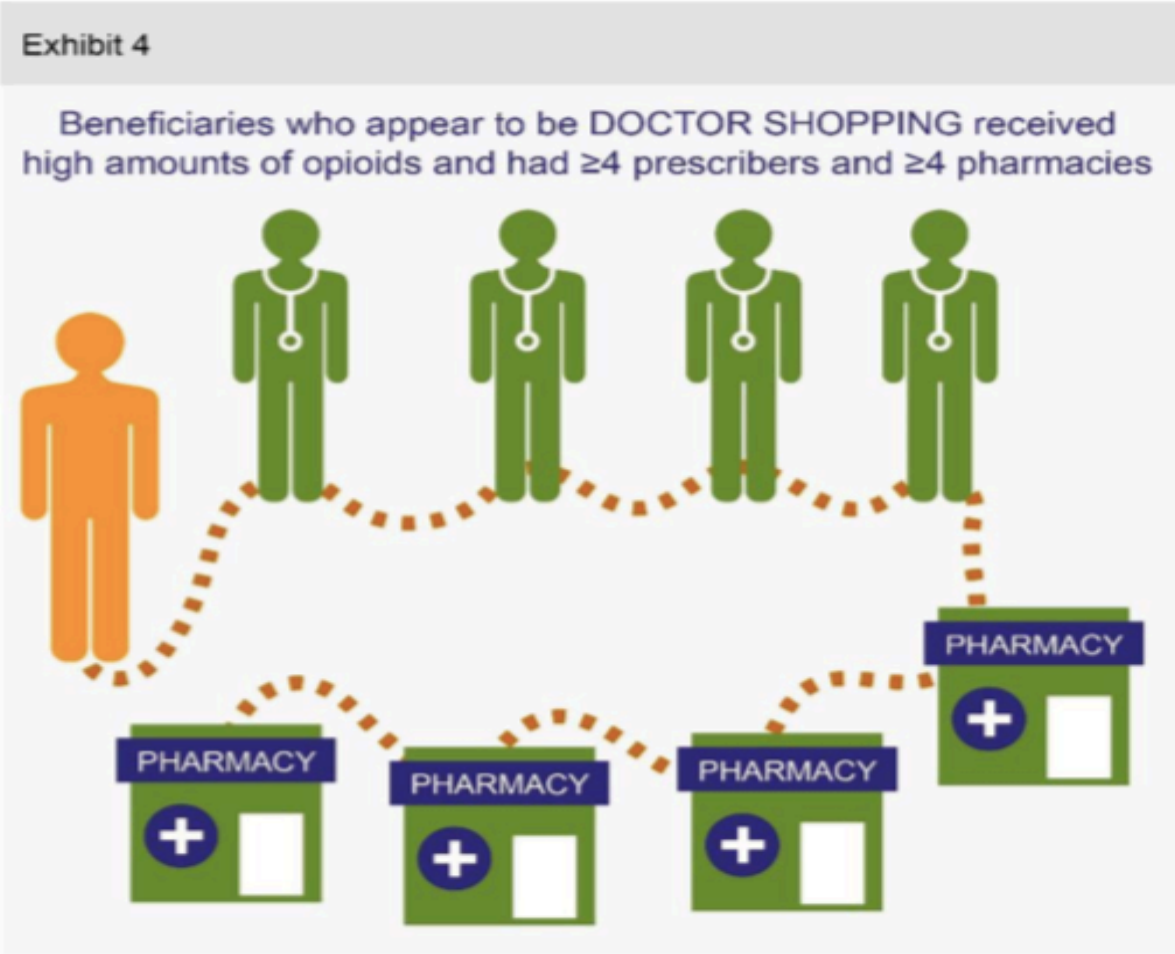
https://oig.hhs.gov/oei/reports/oei-02-17-00250.pdf

From US HHS Data 2017

- Medicare Part D paid almost $4.1 billion for 79.4 million opioids prescriptions for these beneficiaries
- Majorities of these opioids (80%) were Schedule II or III controlled substances (highest potential for abuse among legally available drugs)

https://oig.hhs.gov/oei/reports/oei-02-17-00250.pdf

- About 22,308 beneficiaries appear to be doctor shopping
  - Ie: received high amounts of opioids and had multiple prescribers and pharmacies → At serious risk of opioid misuse or overdose



https://oig.hhs.gov/oei/reports/oei-02-17-00250.pdf

CA Board Occupational Analysis 2021

https://acupuncture.ca.gov/about_us/materials/2021_occanalysis.pdf

TABLE 11 – TREATMENT CATEGORY APPLIED MOST OFTEN WITH PATIENTS OVER THE LAST 12 MONTHS

TREATMENT CATEGORY	NUMBER (N)	PERCENT
Pain management	1,559	55.8
General	335	12.0
Mental health	164	5.9
Women's health	140	5.0
Orthopedics	123	4.4
Fertility	94	3.4
Gastrointestinal	57	2.0
Immune disorders	44	1.6
Sports medicine	42	1.5
Neurological	28	1.0
Oncology support	24	0.9
Geriatrics	19	0.7
Dermatological or cosmetic	17	0.6
Endocrine health	12	0.4
Addiction	8	0.3
Respiratory	8	0.3
Cardiovascular	6	0.2
Pediatrics	6	0.2
Men's health	5	0.2
Missing	16	0.6
Other	88	3.1
Total	2,795	100.0*

*NOTE: Percentages do not add to 100 due to rounding.

PRIMARY TREATMENT FOCUS CATEGORY – CAB 2015 OA

CATEGORY	N	PERCENT
Immune Disorder	11	2.3
Men's Health	1	.2
Women's Health	29	6.0
Gastrointestinal	7	1.4
Pain Management	260	53.6
Neurological	5	1.0
Dermatology/Cosmetic	3	.6
Addiction	3	.6
Mental Health	8	1.6
Endocrine Health	5	1.0
Cardiovascular	6	1.2
Oncology Support	8	1.6
General	123	25.4
Pediatrics	14	2.9
Missing	2	.4
Total	485	100%

NOTE: Total may not add to 100% due to rounding.

https://acupuncture.ca.gov/pubs_forms/other_pubs.shtml

Pain

- Morbidity and Mortality Weekly Report (MMWR) ~ Prevalence of Chronic Pain and High Impact Chronic Pain Among Adults ~ US, 2016
- 2016 → about 20.4% US adults had chronic pain; 8% US adults had high-impact chronic pain
- Chronic pain has been linked to many physical and mental conditions

MMWR – Sept 14, 2018 / 67(36); 1001-1006
https://www.cdc.gov/mmwr/volumes/67/wr/mm6736a2.htm

Pain

- Chronic pain as one of the most common reason adults seek medical care:
  - Linked to restrictions in mobility and daily activity
  - Opioids dependence
  - Anxiety and depression
  - Poor perceived health or reduced quality of life

- *Gureje O et al. JAMA 1998;280:147–51.*
- *Smith BH et al. Fam Pract 2001;18:292–9.*
- *Institute of Medicine. Relieving pain in America: a blueprint for transforming prevention, care, education, and research. Washington, DC: National Academies Press; 2011.*

Definition of Pain

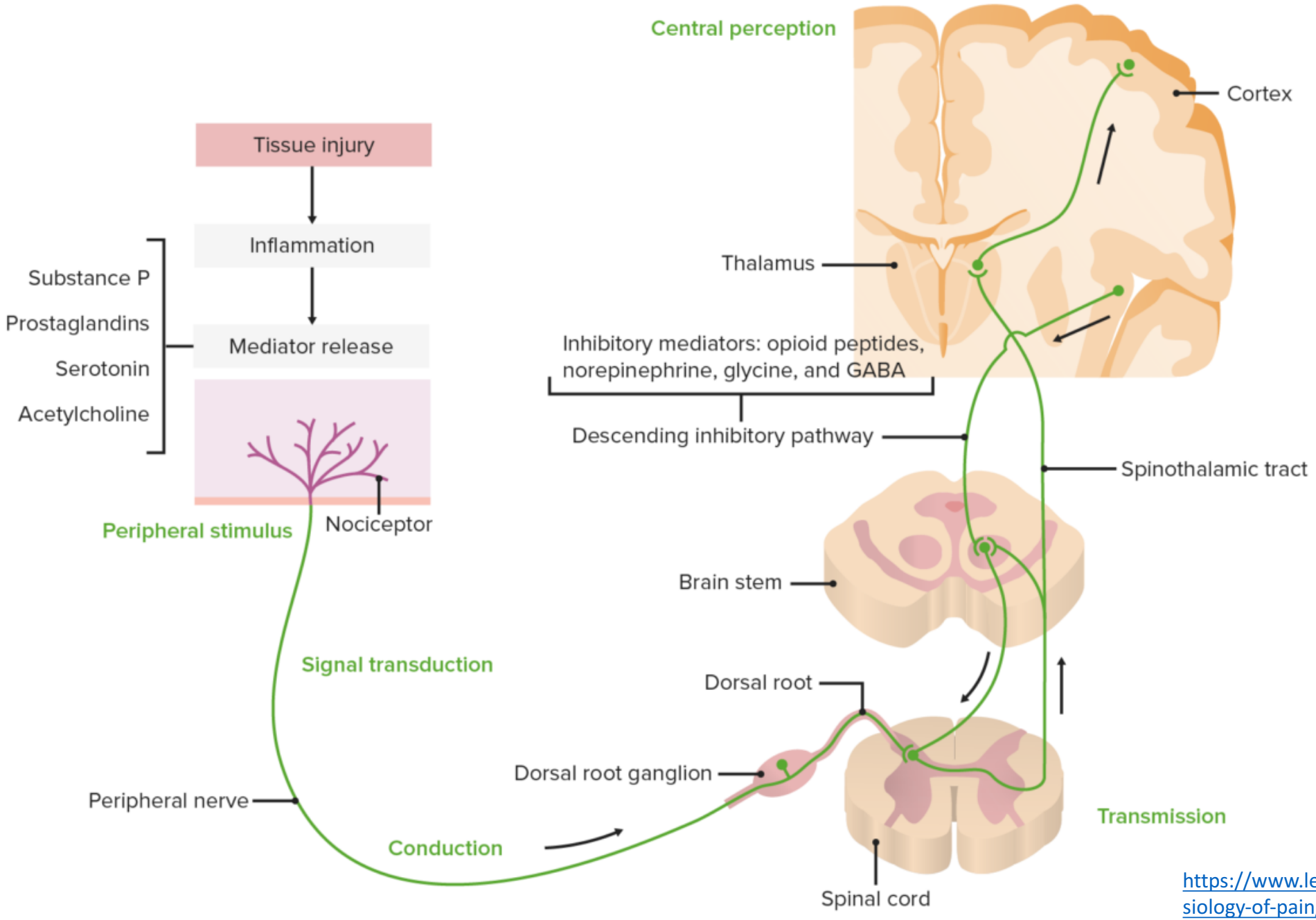
- An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage
- Expanded by addition:
  - Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors
  - Pain and nociception are different phenomena. Pain cannot be inferred solely from activity in sensory neurons.
  - Through their life experiences, individuals learn the concept of pain.
  - A person's report of an experience as pain should be respected.
  - Although pain usually serves an adaptive role, it may have adverse effects on function and social and psychological well-being.
  - Verbal description is only one of several behaviors to express pain; inability to communicate does not negate the possibility that a human or a nonhuman animal experiences pain.

The International Association for the Study of Pain (IASP)
https://www.iasp-pain.org/resources/terminology/#pain

4 Major Processes of Pain

- Transduction
- Transmission
- Modulation
- Perception

Institute of Medicine (US) Committee on Pain, Disability, and Chronic Illness Behavior; Osterweis M, Kleinman A, Mechanic D, editors. Washington (DC): National Academies Press (US); 1987.
https://www.ncbi.nlm.nih.gov/books/NBK219252/



https://www.lecturio.com/concepts/physiology-of-pain/

Sensory VS Affective Aspects of Pain

- Responses processes from noxious stimuli:
  - Sensory responses → Detecting, localizing, assessing intensity, identifying stimulus
  - Affective responses → Unpleasantness, aversive drive to terminate noxious stimulus, can be accompanied by mood changes (anxiety, depression)

- Tolerance for pain differs widely among individuals
- Tolerance is also tied to cognitive and affective aspects of pain

Institute of Medicine (US) Committee on Pain, Disability, and Chronic Illness Behavior; Osterweis M, Kleinman A, Mechanic D, editors. Washington (DC): National Academies Press (US); 1987. https://www.ncbi.nlm.nih.gov/books/NBK219252/

Modulation of Pain

- Reducing transmission from nociceptive afferents
- Descending (inhibitory) pathways
- Role of endogenous opioid peptides (Endorphins, Dynorphins, Enkephalins) in spinal cord, dorsal root ganglia, midbrain periaqueductal gray (PAG)
- Other modulators → Norepinephrine (NE), Glycine, GABA

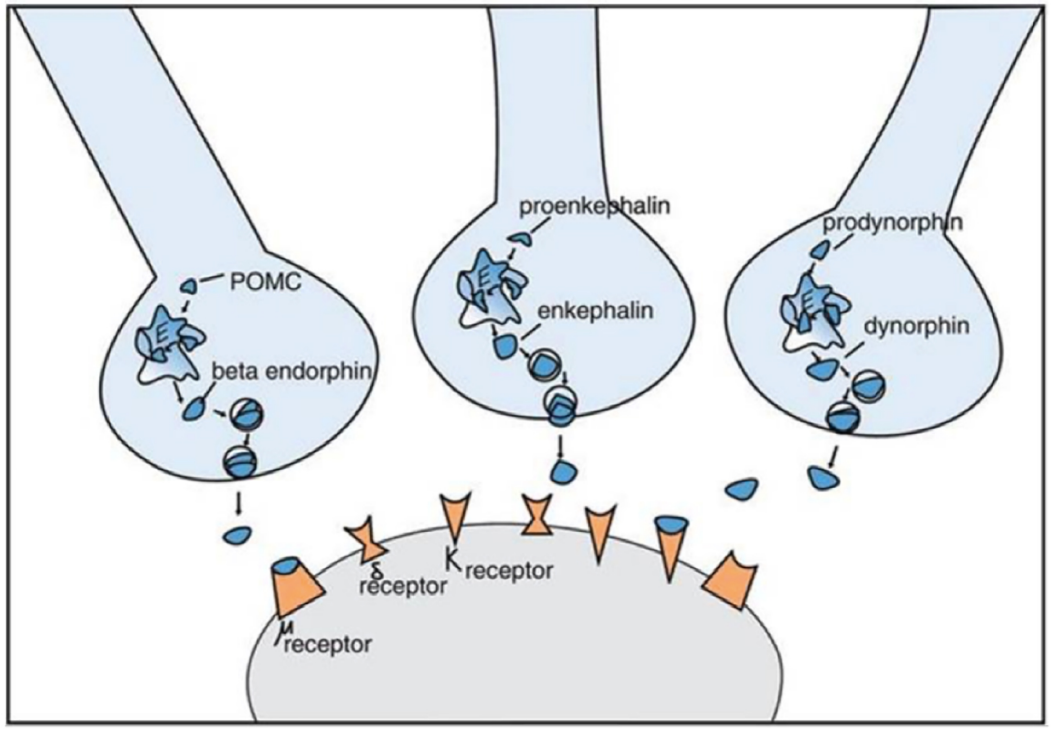
https://www.lecturio.com/concepts/physiology-of-pain/

Mechanisms of Action of Endogenous Opioid

- Activation of mu, kappa, delta opioid receptors
  - << pre-synaptic Ca influx
  - << release of Glutamate and Substance P
- >> Potassium conductance in dorsal horn neurons

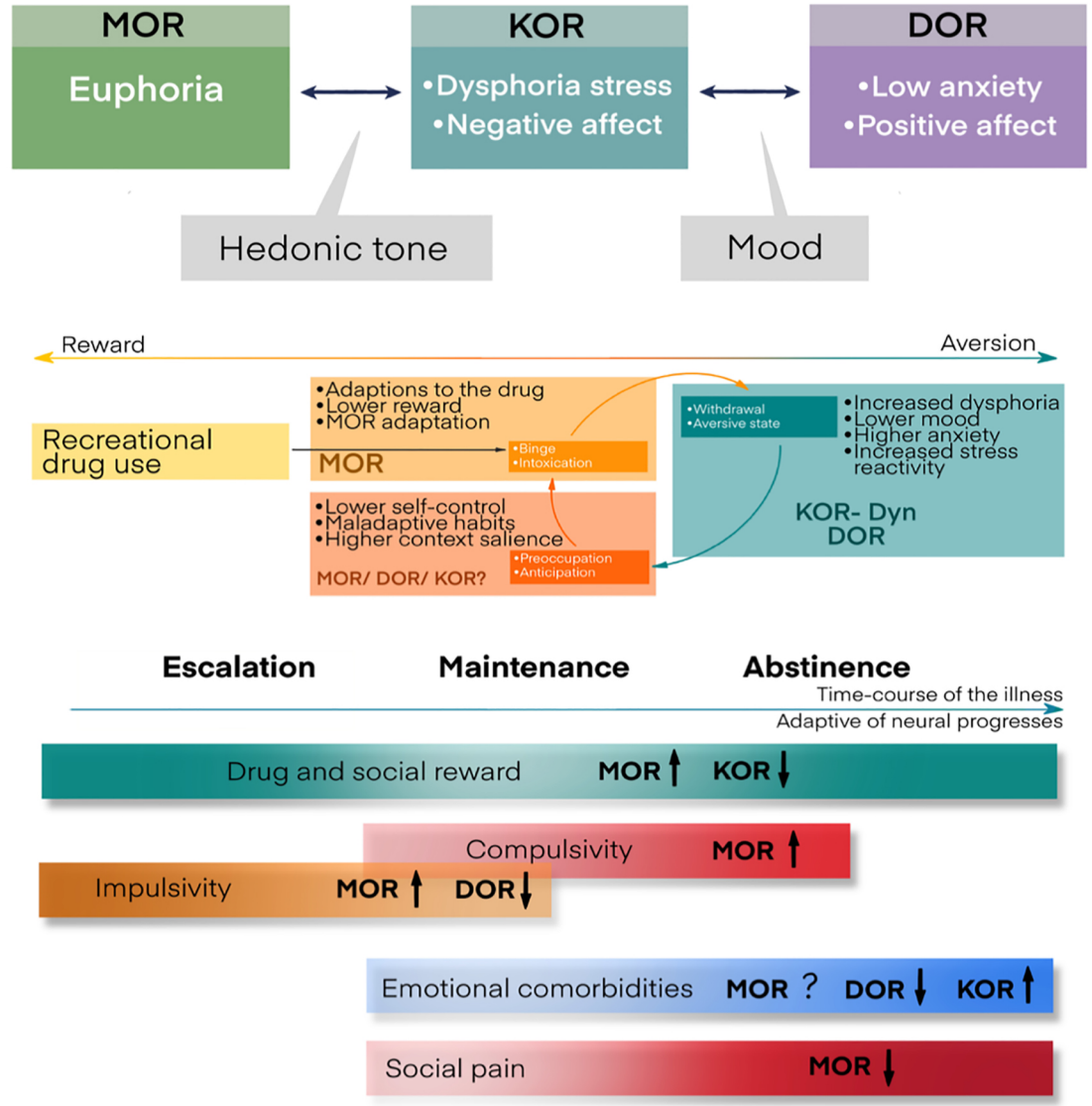
https://www.lecturio.com/concepts/physiology-of-pain/

Endogenous Opioid Neurotransmitters



Genes encoding opioid-related peptides	Main peptide	Receptor	Effects
POMC	beta-endorphin	Mu	Euphoria Constipation Miosis
	met-enkephalin		Analgesia Respiratory depression
Prepro-enkephalin (PENK)	met-enkephalin leu-enkephalin	Delta	Euphoria Analgesia
Prepro-dynorphin (PDYN)	dynorphin A or B neoendorphin	Kappa	Dysphoria Analgesia

Opioid system physiology



Valbrun LP et al. J of Clin Med Res. Vol 12, No 2, Feb 2020, pg 41-63.
https://www.jocmr.org/index.php/JOCMR/article/view/4066/25893058

Acute VS Chronic Pain

Acute Pain	Sub-acute Pain	Chronic Pain
• Begins suddenly • Usually sharp • As a warning of disease or injury • Usually disappears when underlying causes are treated	• Lasts from 6-12 weeks	• Persists longer (months, years) • Psychological factors (anxiety, depression), may affect sleep • Difficult to treat

Acute VS Chronic Pain

- Over the time of injured nerves lead to changes in CNS
- Unseparated somatic factors and psychological factors in maintaining pain
  - Stress and anxiety >> muscle contraction and sympathetic outflow → expected to exacerbate any ongoing pain and problem

Institute of Medicine (US) Committee on Pain, Disability, and Chronic Illness Behavior; Osterweis M, Kleinman A, Mechanic D, editors. Washington (DC): National Academies Press (US); 1987. https://www.ncbi.nlm.nih.gov/books/NBK219252/

Characterization and Consequences of Pain Variability in Individuals with Fibromyalgia

- N=125, Randomized to receive Placebo VS Minalcipran (Dual serotonin / norepinephrine reuptake inhibitor)
- Palm pilot computer to input the pain symptoms and capturing real-world setting of pain
- The study revealed that there were great variability of pain response in Fibromyalgia patients
- Subjects who have more pain have more response to placebo intervention

Harris et al. Arthritis and Rheumatism. 2005 Nov;52(11):3670-4.

Opioid Therapy – SPACE Trial

- Effect of Opioid vs Non-opioid Medications on Pain-Related Function in Patients With Chronic Back Pain or Hip or Knee Osteoarthritis Pain
- 12-month RCT (N=240)
- In the opioid group, the first step was immediate-release morphine, oxycodone, or hydrocodone/acetaminophen
- For the non-opioid group, the first step was acetaminophen (paracetamol) or NSAID
- Outcome meaurement: Pain-related function using using Brief Pain Inventory (BPI) scale over 12 months

Krebs et al. JAMA. 2018. 319 (9):872-882.

Outcome	Opioid Group, Mean (SD) (n = 119)	Nonopioid Group, Mean (SD) (n = 119)	Between-Group Difference (95% CI)[a]	Overall *P* Value[b]
Pain-Related Function (Primary Outcome)				
BPI interference scale (range, 0-10; higher score = worse)[c]				
Baseline	5.4 (1.8)	5.5 (2.0)	−0.1 (−0.6 to 0.4)	
3 mo	3.7 (2.1)	3.7 (2.2)	0.0 (−0.6 to 0.6)	.58
6 mo	3.4 (2.1)	3.6 (2.4)	−0.2 (−0.8 to 0.4)	
9 mo	3.6 (2.2)	3.3 (2.4)	0.4 (−0.2 to 1.0)	
12 mo	3.4 (2.5)	3.3 (2.6)	0.1 (−0.5 to 0.7)	

Opioid Therapy does not provide effective improvement in pain function or intensity over non-opioid group

Krebs et al. JAMA. 2018. 319 (9):872-882.

Adverse Outcomes and Measures of Potential Misuse Among Patients With Chronic Back Pain or Hip or Knee Osteoarthritis Pain Randomized to Opioid vs Nonopioid Medication

Outcome	Opioid Group	Nonopioid Group	Between-Group Difference (95% CI)[a]	*P* Value
Primary Adverse Outcome				
Medication-related symptom checklist (0-19; higher score = worse), mean (SD)[b]				
Baseline	1.2 (1.9)	1.2 (1.9)	0.0 (−0.5 to 0.5)	
3 mo	2.3 (2.5)	1.3 (1.8)	1.0 (0.5 to 1.6)	.03[c]
6 mo	2.1 (2.7)	1.3 (2.3)	0.7 (0.1 to 1.4)	
9 mo	1.9 (2.8)	0.9 (1.9)	1.0 (0.4 to 1.6)	
12 mo	1.8 (2.6)	0.9 (1.8)	0.9 (0.3 to 1.5)	
Secondary Adverse Outcomes				
All-cause hospitalization, No.(%)[d]				
0	99 (83)	99 (83)	0 (−10 to 10)	.94[c]
1	15 (13)	16 (13)	1 (−9 to 8)	
≥2	6 (5)	5 (4)	1 (−5 to 6)	
All-cause ED visit, No.(%)[d]				
0	60 (50)	73 (61)	−11 (−24 to 2)	.18[c]
1	34 (28)	30 (25)	3 (−8 to 15)	
≥2	26 (22)	17 (14)	8 (−2 to 17)	
Number of falls in 12 mo after enrollment, No.(%)[f]				
0	63 (53)	63 (53)	0 (−13 to 13)	.19[c]
1	26 (22)	17 (14)	8 (−2 to 17)	
≥2	29 (25)	39 (33)	−8 (−20 to 3)	

Adverse medication-related symptoms were significantly more common in the opioid group over 12 months

Krebs et al. JAMA. 2018. 319 (9):872-882.

Acetamenophen Study - PACE Trial

- Effects of Acetamenophen (Paracetamol) for LBP
- 235 primary care centers → screened consecutive patients for low back pain (N=1649)
- Randomized to the following:
  - Daily scheduled treatment 3 times daily, daily dose 0f 3990 mg
  - As needed, max of 4000 mg daily
  - Placebo
- Outcome was recovery (0-1 pain intensity for 7 days)
- Result:
  - No difference between treatment groups for time to recovery (adjusted p=0·79)
  - Regular or as-needed dosing with paracetamol does not affect recovery time compared with placebo in low-back pain
  - Questioning the universal endorsement of paracetamol

Williams et al. Lancet. 2014. 384:1586-1596.

Quantitative estimation of rare adverse events which follow a biological progression: a new model applied to chronic NSAID use

- To estimate risk of death from bleeding or perforated gastroduodenal ulcers with chronic use of NSAIDs
- Systematic search for any report of chronic (>/=2 months) use of NSAIDs with gastroduodenal ulcer, bleed or perforation, death due to these complications, or progression from one level of harm to the next
  - 15 RCT (N=19364)
  - 3 Cohort studies (N=215076)
  - 6 Case-control studies (2957 cases)
  - 20 Case series (7406 cases)
  - 4447 case reports
- 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
- This extrapolates to about 2000 deaths each year in the UK

Tramer MR et al. Pain. 2000 Mar;85(1-2):169-82.

Science Press

Journal homepage:
www.jcimjournal.com/jim
www.elsevier.com/locate/issn/20954964
Available also online at www.sciencedirect.com.

• Global Views

Acupuncture's Role in Solving the Opioid Epidemic: Evidence, Cost–Effectiveness, and Care Availability for Acupuncture as a Primary, Non–Pharmacologic Method for Pain Relief and Management—White Paper 2017

Arthur Yin Fan[1], David W. Miller[2,3,4], Bonnie Bolash[3], Matthew Bauer[3,5], John McDonald[3,6], Sarah Faggert[2,7], Hongjian He[2,8,9], Yong Ming Li[10], Amy Matecki[9,11], Lindy Camardella[2,3], Mel Hopper Koppelman[3,6], Jennifer A.M. Stone[2,12], Lindsay Meade[2,3], John Pang[13]

Box 1 Acupuncture for the Use of Numerous Conditions Including Pain Conditions: the Acupuncture Evidence Project (Mar 2013–Sept 2016)

Evidence of positive effect

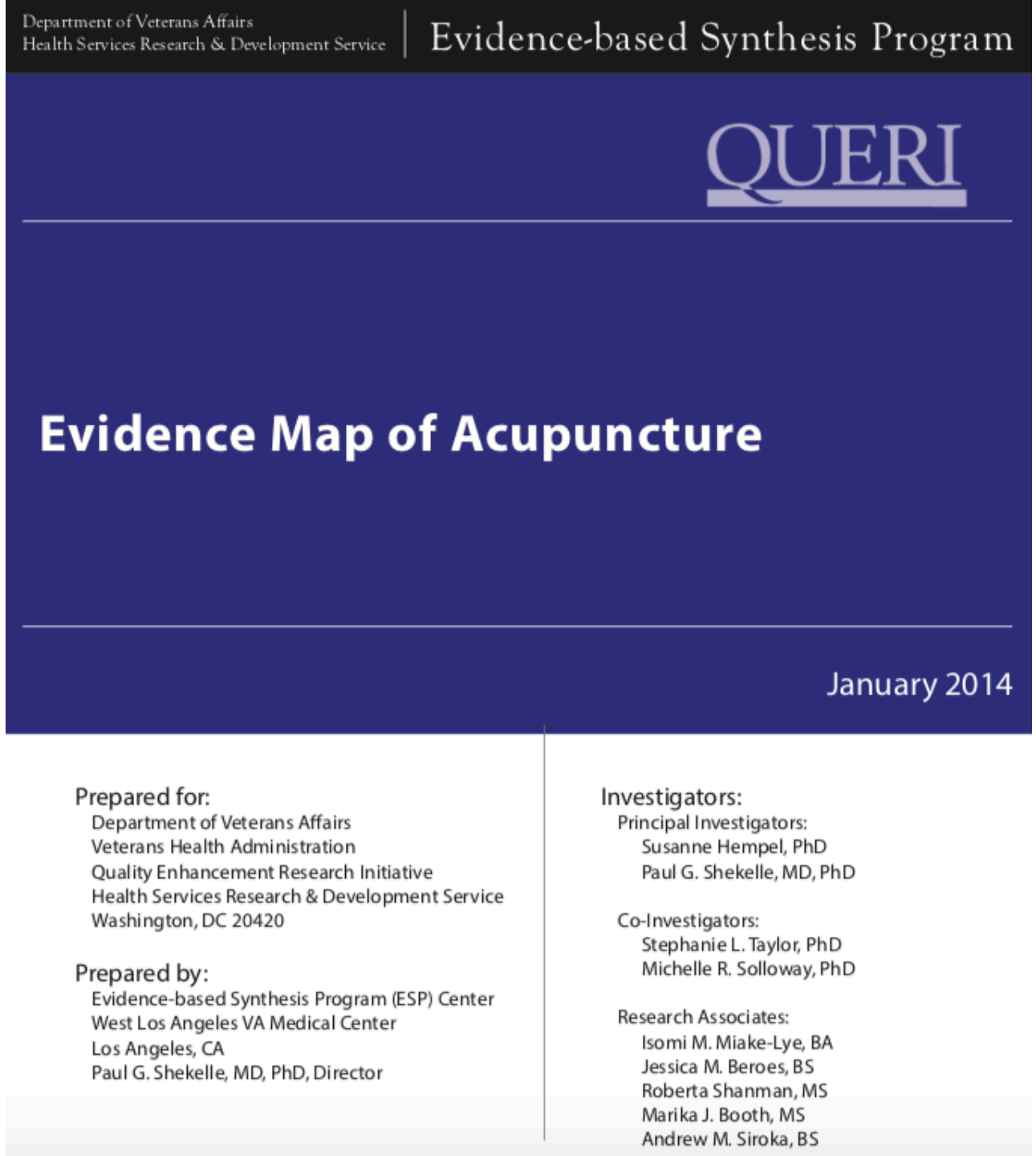
- Allergic rhinitis (perennial & seasonal)
- Chemotherapy-induced nausea and vomiting (with anti-emetics)
- Chronic low-back pain
- Headache (tension-type and chronic)
- Knee osteoarthritis
- Migraine prophylaxis
- Post-operative nausea & vomiting
- Post-operative pain

Evidence of potential positive effect

- Acute low-back pain
- Acute stroke
- Ambulatory anaesthesia
- Anxiety
- Aromatase inhibitor-induced arthralgia
- Asthma in adults
- Back or pelvic pain during pregnancy
- Cancer pain
- Cancer-related fatigue
- Constipation
- Craniotomy anaesthesia
- Depression (with antidepressants)
- Dry eye
- Hypertension (with medication)
- Insomnia
- Irritable bowel syndrome
- Labor pain
- Lateral elbow pain
- Menopausal hot flashes
- Modulating sensory perception thresholds
- Neck pain (some types/non-whiplash)
- Obesity
- Peri-menopausal & post-menopausal insomnia
- Plantar heel pain
- Post-stroke insomnia
- Post-stroke shoulder pain
- Post-stroke spasticity
- Post-traumatic stress disorder
- Prostatitis pain/chronic pelvic pain syndrome
- Recovery after colorectal cancer resection
- Restless leg syndrome
- Schizophrenia (with antipsychotics)
- Sciatica
- Shoulder impingement syndrome (early stage) (with exercise)
- Shoulder pain
- Smoking cessation (up to 3 months)
- Stroke rehabilitation
- Temporomandibular joint disorder

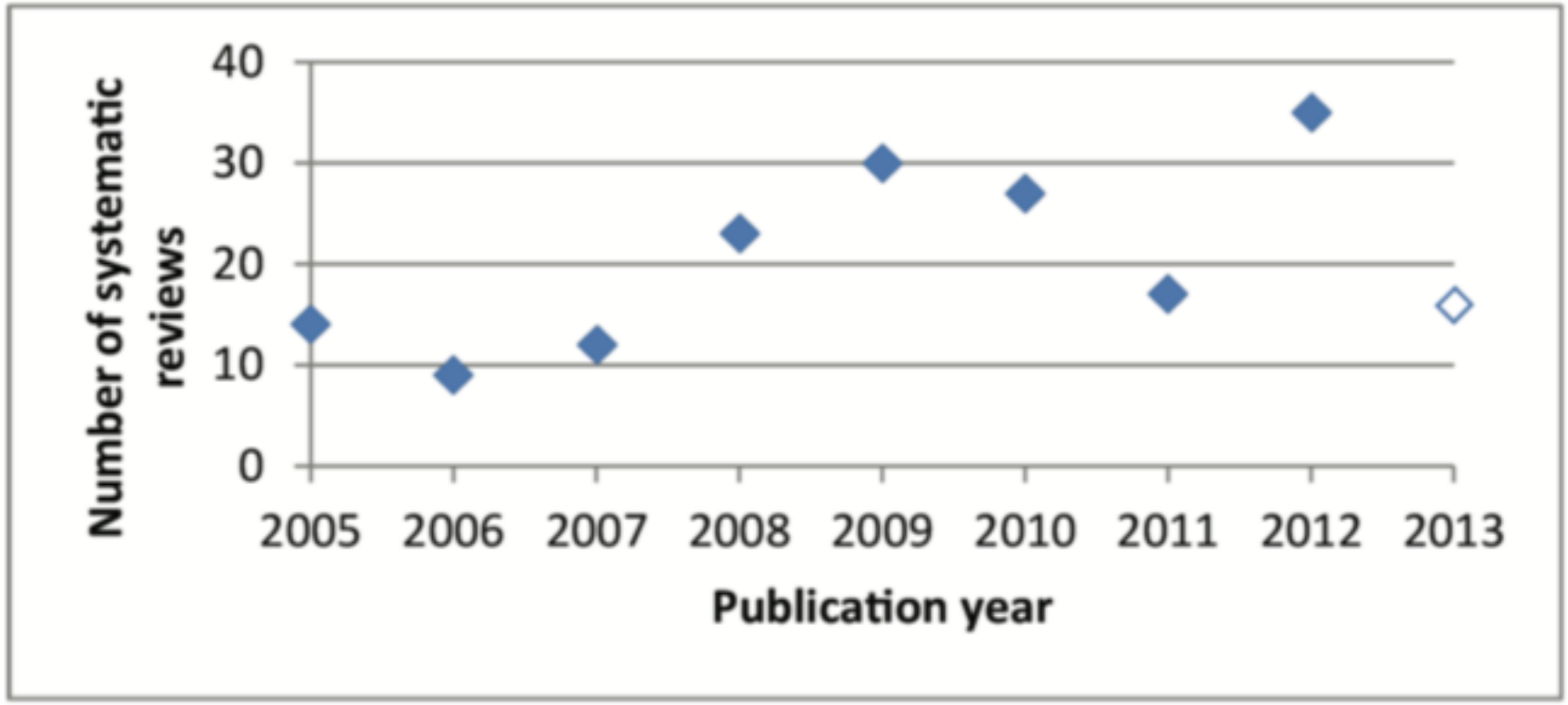
Box 2 Conditions with Demonstrated Evidence of Cost-Effectiveness

- Allergic rhinitis
- Low-back pain
- Ambulatory anaesthesia
- Migraine
- Chronic pain: neck pain (plus usual medical care)
- Depression
- Osteoarthritis
- Dysmenorrhoea
- Post-operative nausea and vomiting
- Headache



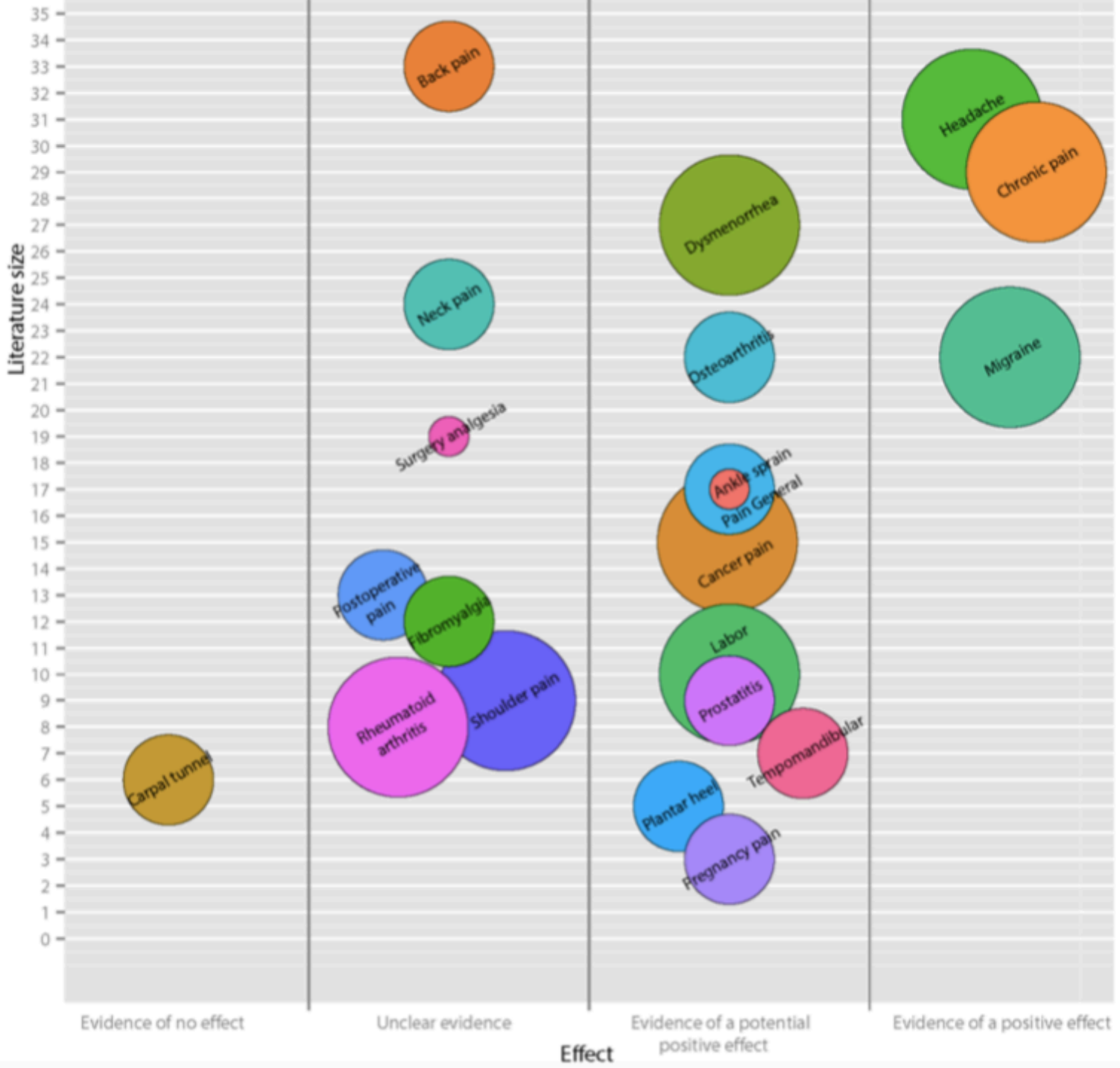
https://www.ncbi.nlm.nih.gov/books/NBK185072/

Systematic reviews on acupuncture published January 2005 to March 2013



https://www.ncbi.nlm.nih.gov/books/NBK185072/

EVIDENCE MAP OF ACUPUNCTURE FOR PAIN



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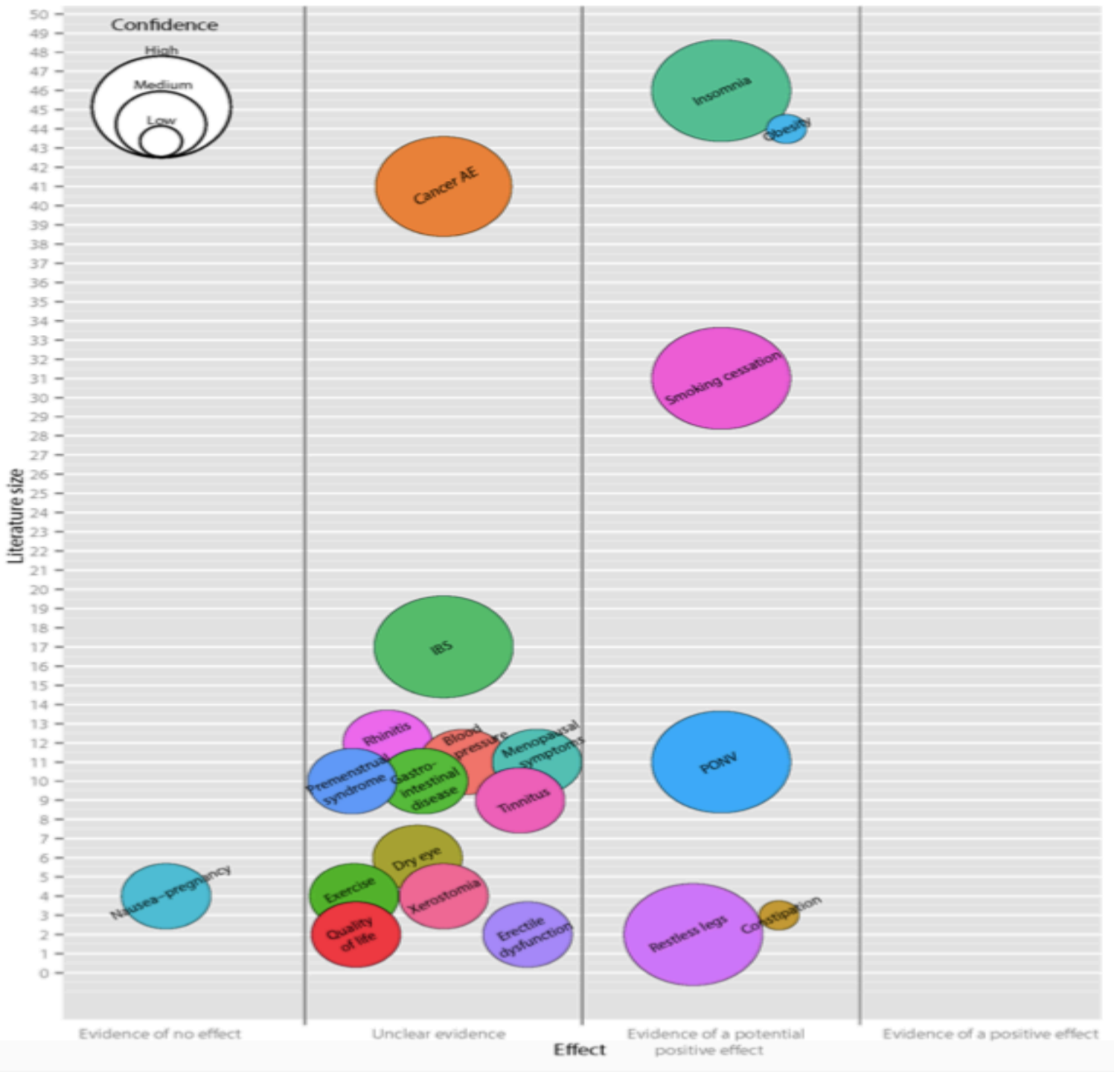
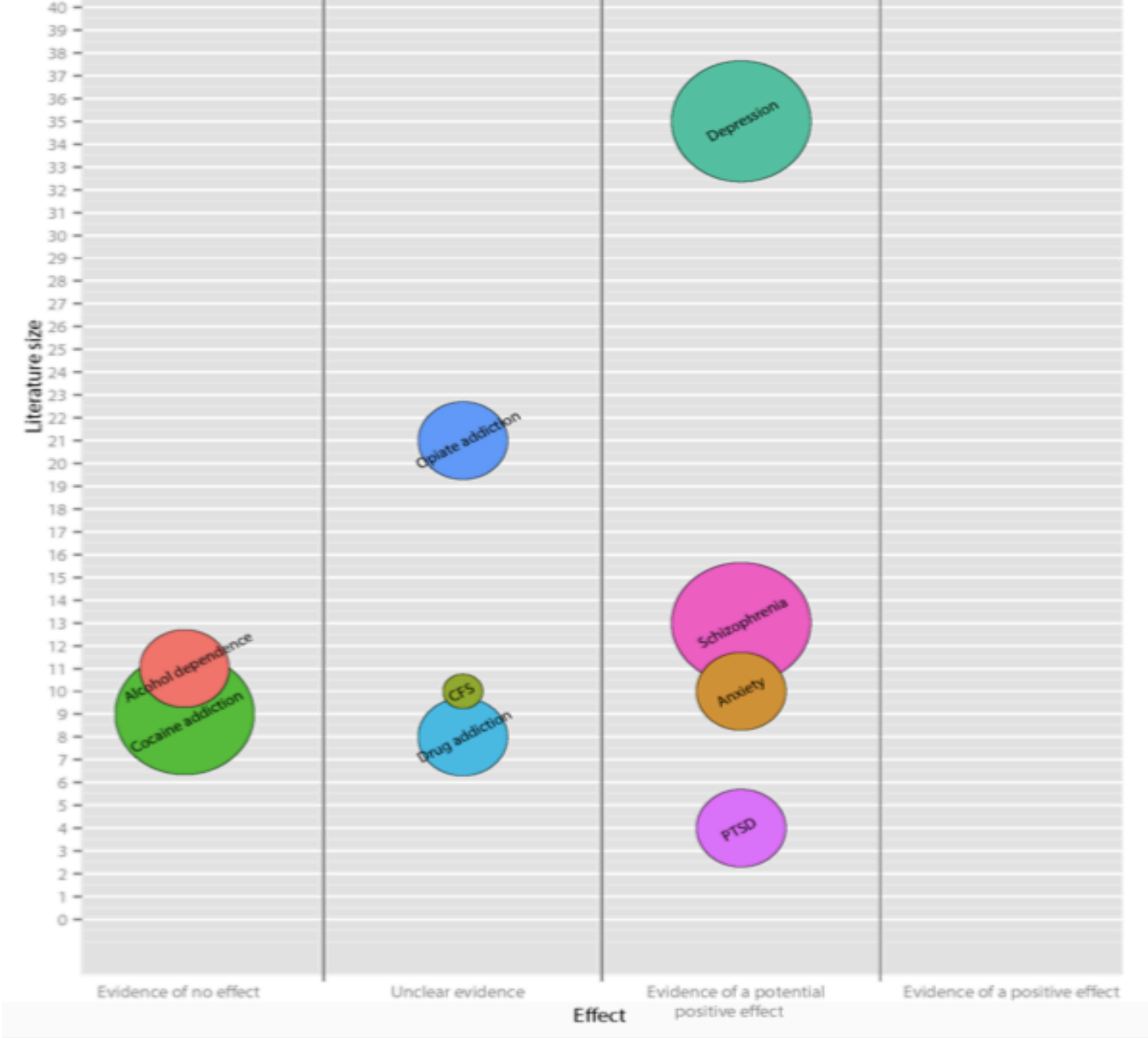
EVIDENCE MAP OF ACUPUNCTURE FOR WELLNESS



https://www.ncbi.nlm.nih.gov/books/NBK185072/

EVIDENCE MAP OF ACUPUNCTURE FOR MENTAL HEALTH



https://www.ncbi.nlm.nih.gov/books/NBK185072/

The Acupuncture Evidence Project

A Comparative Literature Review

John McDonald
Stephen Janz

January 2017
(Revised Edition)

Commissioned by
Australian Acupuncture and Chinese Medicine Association Ltd

AACMA
AUSTRALIAN ACUPUNCTURE & CHINESE MEDICINE ASSOCIATION LTD

Table 2. Statistical summary of findings of this review			
Evidence Level	**Number of Conditions**	**Changes in Level of Evidence**	**Number of Conditions**
Evidence of Positive effect	8	Increase to positive effect	5
Evidence of Potential positive effect	38	Increase to potential positive effect	18
Unclear/insufficient evidence	71	Increase to unclear/insufficient evidence	1
No evidence of effect	5	Decreased evidence level	2
Total conditions with some evidence of effect (any level)	117	_____	____
Total conditions reviewed	122	Total increases in evidence level since prior reviews	24

- Migraine Prophylaxis
- Headache (chronic tension-type and chronic episodic)
- Low back pain [Chronic – positive effect; acute – potential positive effect]
- Knee osteoarthritis pain
- Allergic rhinitis (seasonal and perennial/persistent)
- Chemotherapy-induced nausea and vomiting
- Post-operative nausea and vomiting
- Post-operative Pain

Acupuncture Mechanisms for Pain Reduction

- Peripheral Level
- Segmental Level
- Central Level

Acupuncture Mechanisms for Pain Reduction

- Peripheral Level → Connective tissue activities
  - When a needle is pulled from the skin, it was noticed that there is an activity in the connective tissue (Fibroblast)
  - Fibroblast model:
    - 2 Main Proteins:
      - Rho → at the center; pulled the fibroblast body towards to the nucleus
      - Rac → at the peripheral; pulled the fibroblast body towards the lateral
  - Stretched part of the body produced stretching image of the fibroblast compared to non-stretched part
  - Similar stretching activity of the fibroblast was seen when the acupuncture manipulation is given
  - Acupuncture induces the fibroblast stretching by increasing the production of ATP
  - ATP released effect is recorded to have the highest increased at 30 minutes before degrading

Langevin et al. FASEB Journal. Vol 15, Oct 2001, pg 2275-2282
Langevin HM et al. J Cell Physiol. 2006 Jun;207(3):767-74.
Langevin HM et al. J Cell Physiol 2011
Goldman et al. J Nat Neurosci. 2010 July; 13(7): 883–888.
Langevin HM et al. J Cell Physiol. 2013 September; 228(9): 1-12.
Abbott et al. J Cell Physiol. 2013 Jan; 228(1): 50–57.

Acupuncture Mechanisms for Pain Reduction

- Segmental Level → Diffuse noxious inhibitory control
  - Concept of neurogenic inflammation → Inflammation evoked by afferent fibers particularly C and A-delta fibers
  - Signal carried by the A-delta fiber cause input disruption in the dorsal horn of spinal cord carried by C-fiber
  - Influences on the spinal segment similarly caused the diffuse neuron response that inhibits the pain signal carried by the C-fiber to the upper level
  - The nociceptive transmission (ie: the pain signal from the local inflamed tissue) from the afferent fibers is transmitted to the dorsal horn of spinal cord.
  - During this process, other transmission carried from the afferent fibers that came from different input of origin (ie: the signal from the acupuncture stimulation) interact with the nociceptive transmission carried by the fibers from the injured tissue.
  - This interaction activity caused a wind-up phenomenon → leading to diffuse pain sensitivity occurred in the dorsal horn → generating inhibitory transmission to the nociceptive signal carried by the afferent fibers of injured tissue.
  - The signal from the acupuncture induced fibers will be transmitted instead into the upper level to reach the cerebral region

Woolf, CJ Ann Int Med, 2004, 140:441-451
Shah JP et al. J Appl Physiol. 2005;99(5):1977-84.

Acupuncture Mechanisms for Pain Reduction

- Central Level → Affects state of emotion, hormones, neuropeptides on limbic forebrain and hypothalamus; induces production of endogenous opioid due to influence at Periaqueductal Gray (PAG)
  - Study using fMRI, specific *deqi* response evoked a deactivation response to the limbic structure
  - Evidence of brain activation in resting state produced higher activity compared when a motor task is given --- Default Mode Network (DMN)
  - DMN had greater intrinsic connectivity within its component including posterior cingulate cortex, inferior parietal lobule, insula and sensorimotor regions
  - Intrinsic brain connectivity is altered in fibromyalgia patients
  - The DMN connectivity to right insula is also correlated with clinical pain
  - The insula integrates subcortical hemostatic information such as arising from pain state, into a higher-order cognitive and affective conscious state of awareness
  - Following the treatment result from acupuncture, DMN connectivity to Insula is decreased
  - Reduction of DMN connectivity to Insula is significant with the pain reduction
  - Acupuncture increases spatial extent of resting connectivity between DMN and periaqueductal gray which is associated with the limbic pain and anti-nociceptive

Hui et al. NeuroImage 27 (2005) 479 – 496; *Biswal et al. MRM 34.537541 (1995).*
Napadow et al. Arthritis Rheum. 2010 August ; 62(8): 2545–2555.
Dhond et al. Pain. 2008 June ; 136(3): 407–418
Napadow et al. Arthritis Rheum. 2012 July ; 64(7): 2398–2403.

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Acupuncture for chronic pain: individual patient data meta-analysis

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Abstract

Background—Although acupuncture is widely used for chronic pain, there remains considerable controversy as to its value. We aimed to determine the effect size of acupuncture for four chronic pain conditions: back and neck pain, osteoarthritis, chronic headache, and shoulder pain.

Methods—We conducted a systematic review to identify randomized trials of acupuncture for chronic pain where allocation concealment was determined unambiguously to be adequate. Individual patient data meta-analyses were conducted using data from 29 of 31 eligible trials, with a total of 17,922 patients analyzed.

Results—In the primary analysis including all eligible trials, acupuncture was superior to both sham and no acupuncture control for each pain condition (all $p<0.001$). After exclusion of an outlying set of trials that strongly favored acupuncture, the effect sizes were similar across pain conditions. Patients receiving acupuncture had less pain, with scores 0.23 (95% C.I. 0.13, 0.33), 0.16 (95% C.I. 0.07, 0.25) and 0.15 (95% C.I. 0.07, 0.24) standard deviations lower than sham controls for back and neck pain, osteoarthritis, and chronic headache respectively; the effect sizes in comparison to no acupuncture controls were 0.55 (95% C.I. 0.51, 0.58), 0.57 (95% C.I. 0.50, 0.64) and 0.42 (95% C.I. 0.37, 0.46). These results were robust to a variety of sensitivity analyses, including those related to publication bias.

Conclusions—Acupuncture is effective for the treatment of chronic pain and is therefore a reasonable referral option. Significant differences between true and sham acupuncture indicate that acupuncture is more than a placebo. However, these differences are relatively modest, suggesting that factors in addition to the specific effects of needling are important contributors to the therapeutic effects of acupuncture.

Vickers et al. JAMA. Arch Int Med. 2012. 172 (19):1444-1453

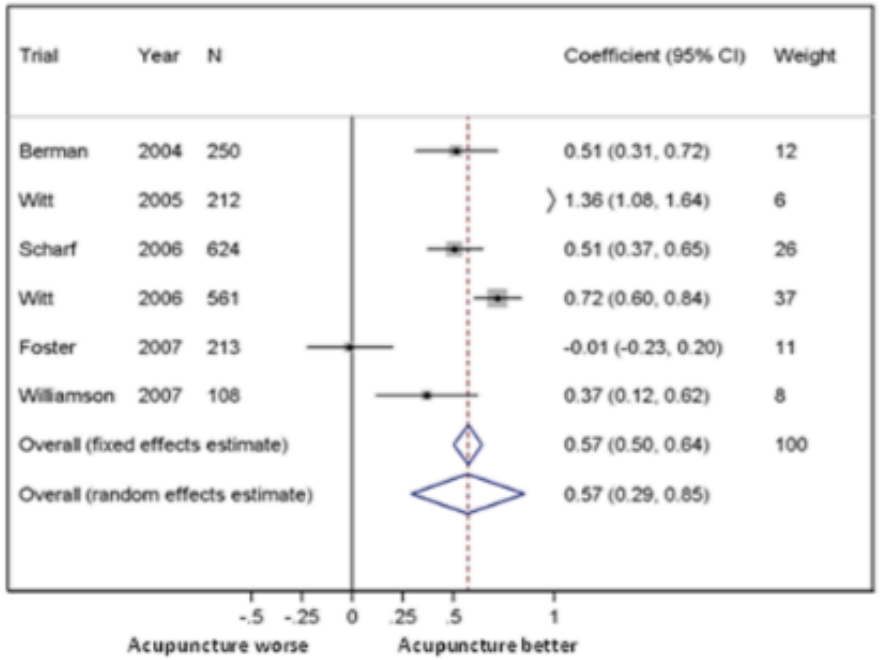
Table 1. Characteristics of Included Studies[a]

Indication (n = 35 Studies)	Pain Type	Control Group	Primary Outcome Measure	Time Point
Chronic headache (n=7)	Migraine (n=2)[13,18]; tension-type headache (n=3)[14,16,29]; both (n=2)[21,33]	Sham control (n=4)[13,14,16,18] No-acupuncture control (n=6); ancillary care (n=1)[29b]; usual care (n=4)[16,18,21,33c]; guidelined care (n=1)[13d]	Severity score (n=2)[29,33]; days with headache (n=1)[14]; days with migraine (n=3)[13,16,21]; days with moderate-to-severe pain (n=1)[18]	1 mo (n=1)[29] 3 mo (n=3)[16,18,21] 6 mo (n=2)[13,14] 12 mo (n=1)[33]
Nonspecific musculoskeletal pain (back and neck) (n=15)	Back (n=10)[e]; neck (n=5)[20,26,27,36,37]	Sham control (n=10)[f] No-acupuncture control (n=9); ancillary care (n=135)[b]; usual care (n=6)[15,19,20,23,36,94b]; nonspecific advice (n=1)[35g]; guidelined care (n=1)[12d]	VAS (n=7)[15,26,27,30-32,37]; Roland Morris Disability Questionnaire (n=3)[34,35,94]; Neck Pain and Disability (n=1)[20]; Hannover Functional Questionnaire (n=1)[19]; Northwick Park Neck Pain Questionnaire (n=1)[36]; Von Korff pain score (n=1)[12]; SF-36 Bodily pain (n=1)[23]	1 mo (n=4)[26,27,31,37] 2 mo (n=3)[15,35,94] 3 mo (n=5)[19,20,30,34,36,95,96] 6 mo (n=2)[12,32] 24 mo (n=1)[23]
Osteoarthritis (n=9)		Sham control (n=6)[11,17,24,28,38,95] No-acupuncture control (n=8); ancillary care (n=2)[11,24,95b]; usual care (n=4)[17,22,96c]; nonspecific advice (n=2)[28,39g]	Oxford Knee score questionnaire (n=1)[79]; WOMAC (n=2)[17,22]; WOMAC Pain subscore (n=6)[11,24,28,38,95,96]	2 mo (n=2)[17,39] 3 mo (n=4)[22,38,95,96] 6 mo (n=3)[11,24,28]
Shoulder pain (n=4)		Sham control (n=4)[25,40,41,97] No-acupuncture control (n=1); usual care (n=1)[97c]	Constant-Murley score (n=2)[25,41]; VAS (n=2)[40,97]	1 mo (n=2)[25,41] 6 mo (n=2)[40,97]

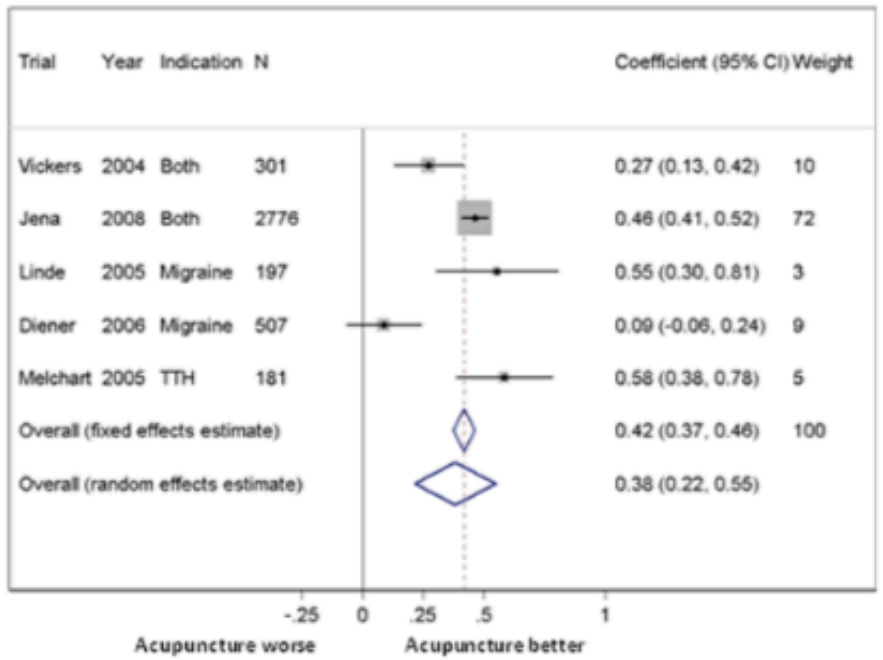
Acupuncture VS No Acupuncture Control

Vickers et al. JAMA. Arch Int Med. 2012. 172 (19):1444-1453

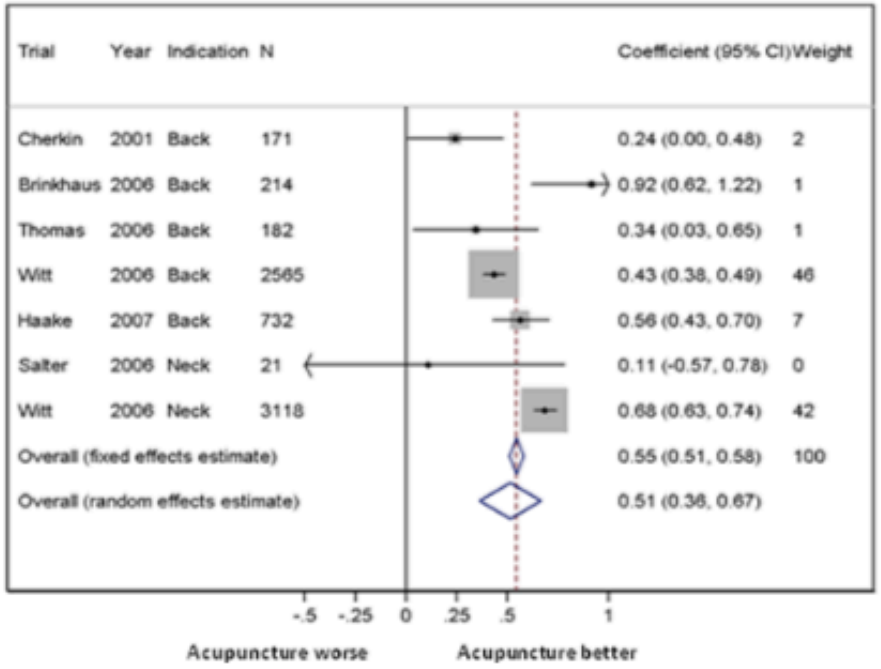
A. Osteoarthritis



B. Chronic Headache



C. Musculoskeletal Pain

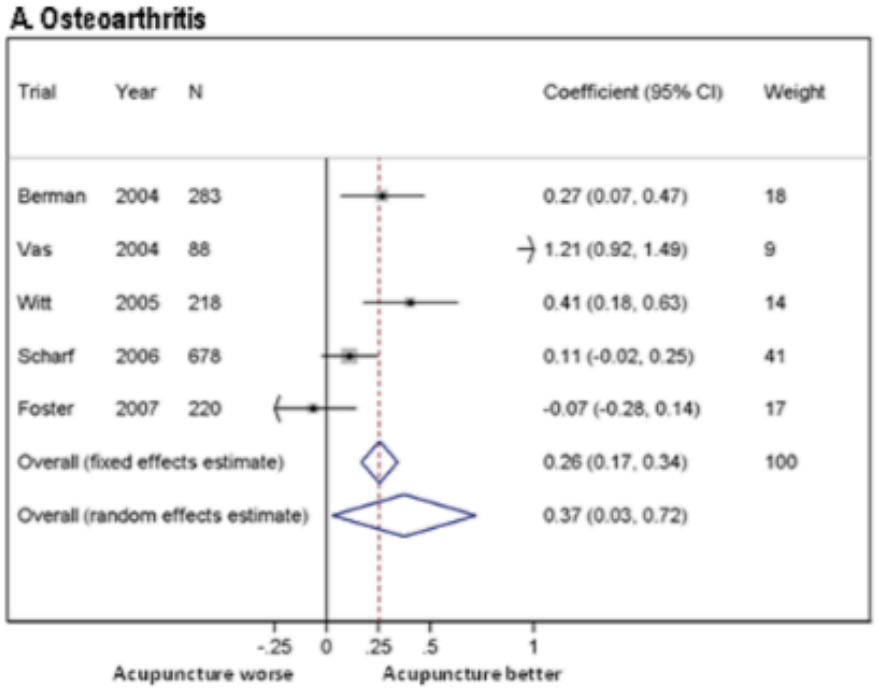


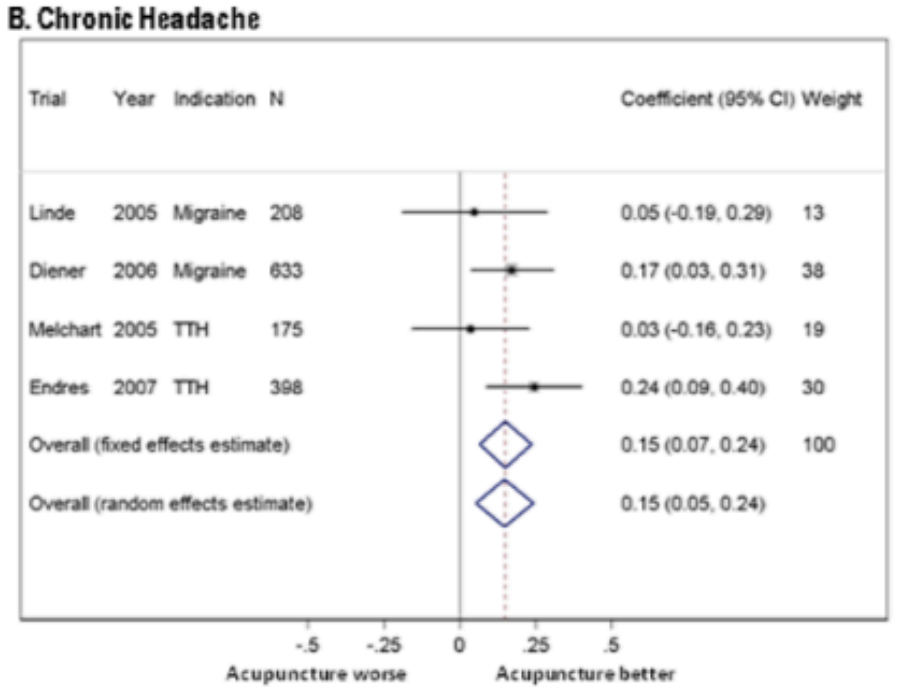
D. Shoulder Pain

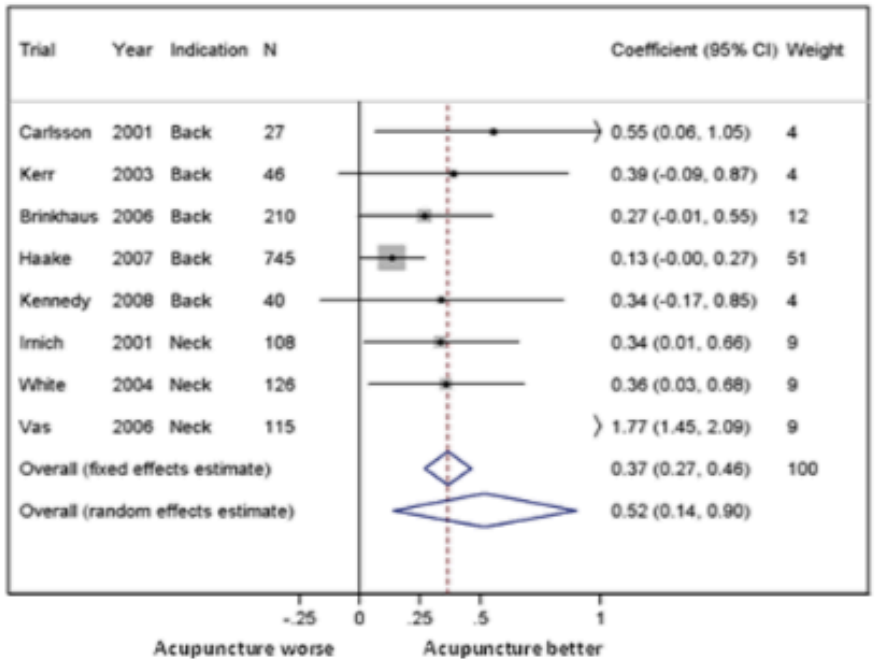
Fewer than 3 trials – no meta analysis performed

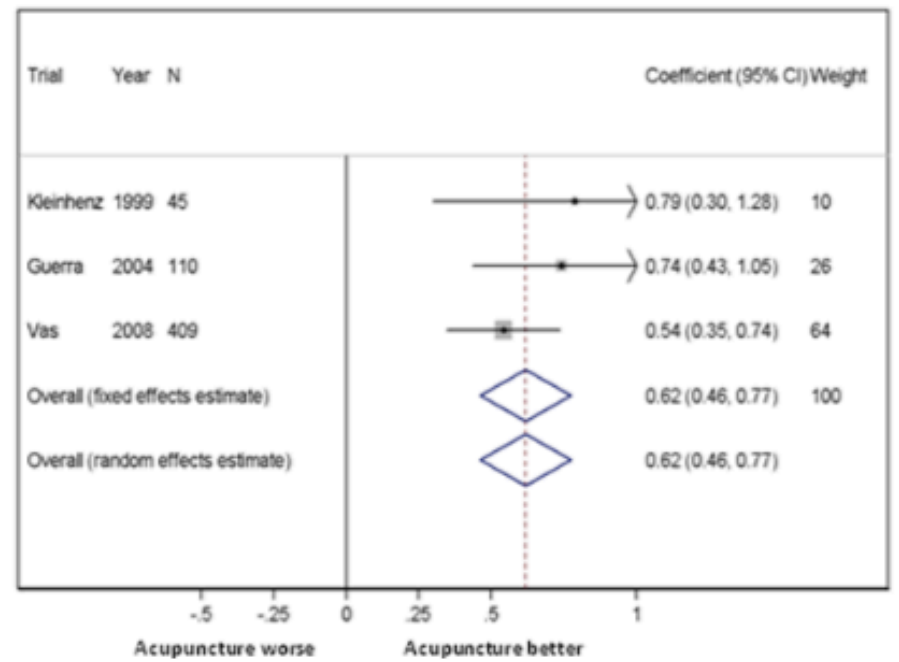
True Acupuncture VS Sham Acupuncture

Vickers et al. JAMA. Arch Int Med. 2012. 172 (19):1444-1453









Result: Primary Analysis Outcome

Table 2. Primary Analyses[a]

Indication	Studies, No.	Acupuncture vs Sham Acupuncture			Acupuncture vs No-Acupuncture Control			
		FE (95% CI)	Heterogeneity: *P* Value	RE (95% CI)	No.	FE (95% CI)	Heterogeneity: *P* Value	RE (95% CI)
Nonspecific musculoskeletal pain (back and neck)	8	0.37 (0.27-0.46)	<.001	0.52 (0.14-0.90)	7	0.55 (0.51-0.58)	<.001	0.51 (0.36-0.67)
Osteoarthritis	5	0.26 (0.17-0.34)	<.001	0.37 (0.03-0.72)	6	0.57 (0.50-0.64)	<.001	0.57 (0.29-0.85)
Chronic headache	4	0.15 (0.07-0.24)	.31	0.15 (0.05-0.24)	5	0.42 (0.37-0.46)	<.001	0.38 (0.22-0.55)
Shoulder pain	3	0.62 (0.46-0.77)	.44	0.62 (0.46-0.77)	0	No trials		

- Significant differences between true and sham acupuncture indicate that acupuncture is superior than a placebo
- Acupuncture is effective for the treatment of chronic pain

Vickers et al. JAMA. Arch Int Med. 2012. 172 (19):1444-1453

Result: Primary Analysis Outcome

Table 2. Primary Analyses[a]

Indication	Studies, No.	Acupuncture vs Sham Acupuncture			Acupuncture vs No-Acupuncture Control			
		FE (95% CI)	Heterogeneity: *P* Value	RE (95% CI)	No.	FE (95% CI)	Heterogeneity: *P* Value	RE (95% CI)
Nonspecific musculoskeletal pain (back and neck)	8	0.37 (0.27-0.46)	<.001	0.52 (0.14-0.90)	7	0.55 (0.51-0.58)	<.001	0.51 (0.36-0.67)
Osteoarthritis	5	0.26 (0.17-0.34)	<.001	0.37 (0.03-0.72)	6	0.57 (0.50-0.64)	<.001	0.57 (0.29-0.85)
Chronic headache	4	0.15 (0.07-0.24)	.31	0.15 (0.05-0.24)	5	0.42 (0.37-0.46)	<.001	0.38 (0.22-0.55)
Shoulder pain	3	0.62 (0.46-0.77)	.44	0.62 (0.46-0.77)	0	No trials		

- Effect Size Small

Vickers et al. JAMA. Arch Int Med. 2012. 172 (19):1444-1453

Influence of Control Group on Effect Size in Trials of Acupuncture for Chronic Pain: A Secondary Analysis of an Individual Patient Data Meta-Analysis

Table 5. Difference in effect sizes between types of sham control. Estimates obtained using meta-regression.

	Main Analysis			Excluding Vas et al. trials [12] [13] [14]		
	No. of Trials*	Change in Effect Size	p value	No. of Trials*	Change in Effect Size	p value
Needle vs. Non-needle sham	16 vs. 4	0.02 (−0.49, 0.53)	0.9	13 vs. 4	−0.17 (−0.43, 0.09)	0.2
Non-penetrating needle vs. Non-needle sham	7 vs. 4	0.35 (−0.28, 0.99)	0.3	4 vs. 4	0.01 (−0.45, 0.47)	1
Penetrating needle vs. Non-penetrating needle	9 vs. 7	−0.57 (−0.96, −0.18)	0.004	9 vs. 4	−0.19 (−0.47, 0.08)	0.2
Penetrating needle vs. Non-needle sham	9 vs. 4	−0.21 (−0.41, −0.01)	0.036	9 vs. 4	−0.21 (−0.41, −0.01)	0.036
Penetrating needle vs. Non-needle or Non-penetrating needle	9 vs. 11	−0.45 (−0.78, −0.12)	0.007	9 vs. 8	−0.19 (−0.39, 0.01)	0.058

- Trials that used penetrating needles for sham control → Acupuncture had smaller effect sizes
- Trials with non-penetrating sham or sham control without needles → Higher effect sizes
- Acupuncture was significantly superior to all categories of control group
- Penetrating needles have important physiologic activity
- Recommended this type of sham to be avoided

MacPherson et al. PLOS One. 2014. 9(4):1-8

STRICTA

Table 1. STRICTA 2010 checklist of information to include when reporting interventions in a clinical trial of acupuncture.

Item		Detail
1.	**Acupuncture rationale**	1a) Style of acupuncture (e.g. Traditional Chinese Medicine, Japanese, Korean, Western medical, Five Element, ear acupuncture, etc)
		1b) Reasoning for treatment provided, based on historical context, literature sources, and/or consensus methods, with references where appropriate
		1c) Extent to which treatment was varied
2.	**Details of needling**	2a) Number of needle insertions per subject per session (mean and range where relevant)
		2b) Names (or location if no standard name) of points used (uni/bilateral)
		2c) Depth of insertion, based on a specified unit of measurement, or on a particular tissue level
		2d) Response sought (e.g. *de qi* or muscle twitch response)
		2e) Needle stimulation (e.g. manual, electrical)
		2f) Needle retention time
		2g) Needle type (diameter, length, and manufacturer or material)
3.	**Treatment regimen**	3a) Number of treatment sessions
		3b) Frequency and duration of treatment sessions
4.	**Other components of treatment**	4a) Details of other interventions administered to the acupuncture group (e.g. moxibustion, cupping, herbs, exercises, lifestyle advice)
		4b) Setting and context of treatment, including instructions to practitioners, and information and explanations to patients
5.	**Practitioner background**	5) Description of participating acupuncturists (qualification or professional affiliation, years in acupuncture practice, other relevant experience)
6.	**Control or comparator interventions**	6a) Rationale for the control or comparator in the context of the research question, with sources that justify this choice
		6b) Precise description of the control or comparator. If sham acupuncture or any other type of acupuncture-like control is used, provide details as for Items 1 to 3 above.

Note: This checklist, which should be read in conjunction with the explanations of the STRICTA items provided in the main text, is designed to replace CONSORT 2010's item 5 when reporting an acupuncture trial.

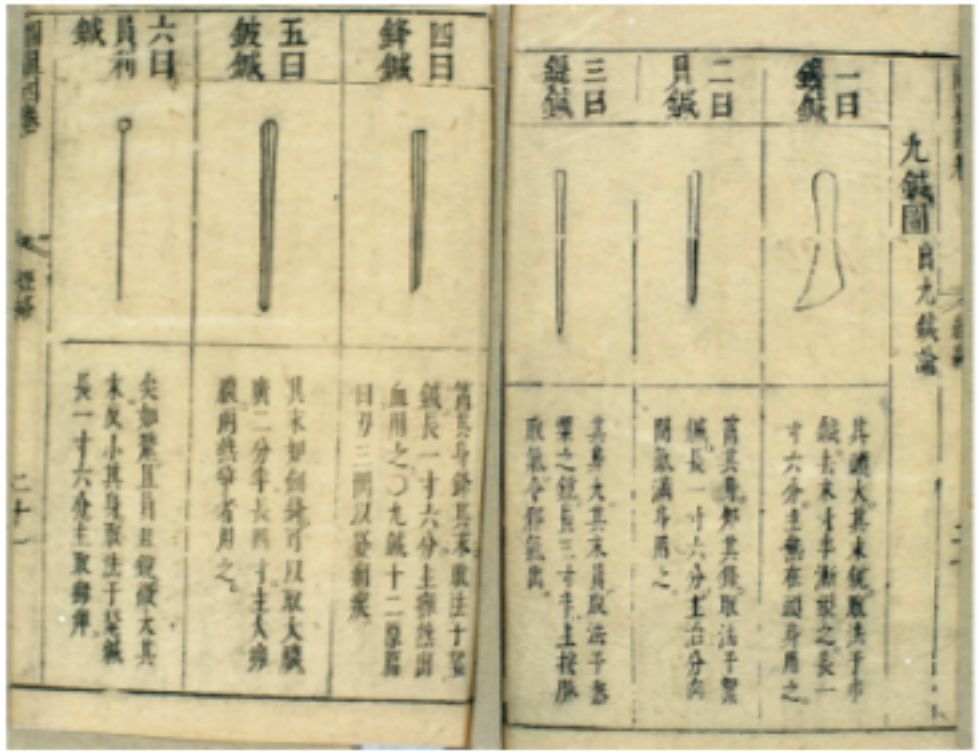
doi:10.1371/journal.pmed.1000261.t001

MacPherson et al. 2010. PLoS Medicine.

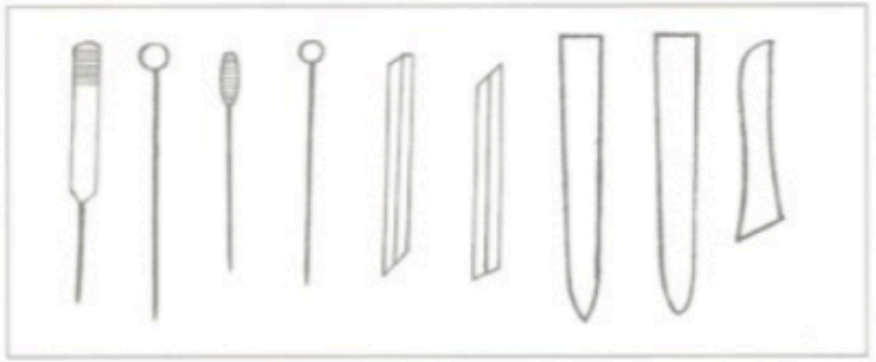
Basic in Treatment ?

- Historical references
- Anatomical precise, tissue based
- Pattern of Disharmony
- Evidence based

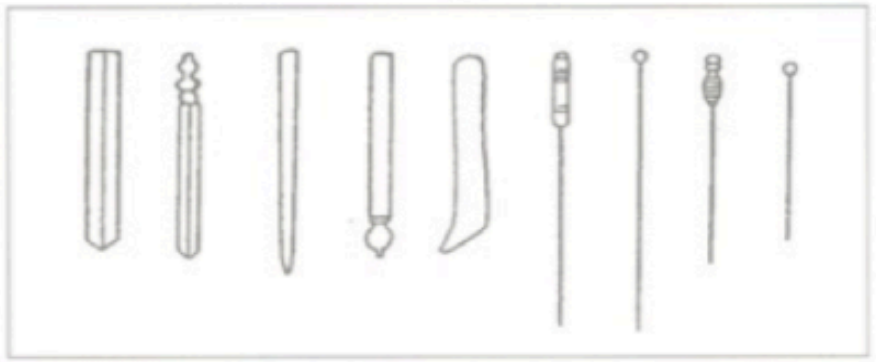
- Zhen Jiu Da Cheng (1601)
- Sugiyama Ryu Sambusho (1700)
- Shinkyu Cho Hoki (1726)



The Nine Needles from the *Zhen Jiu Da Cheng*



The Nine Needles from *Sugiyama Ryū Sambusho*.



The Nine Needles from *Shinkyū Chō Hoki*.

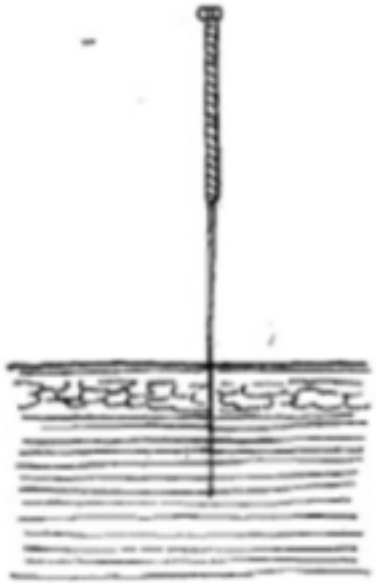


图3-5 分刺

Fig. 3-5 Muscular needling

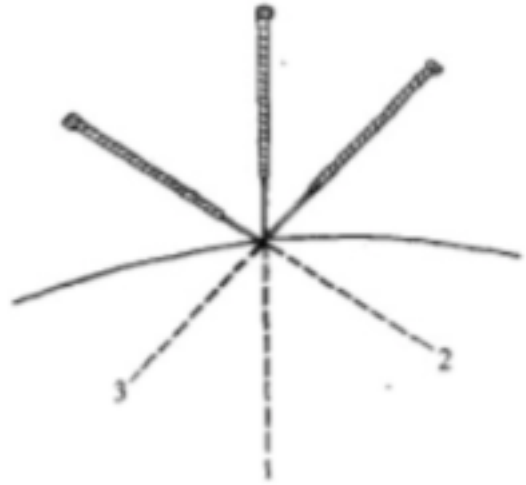
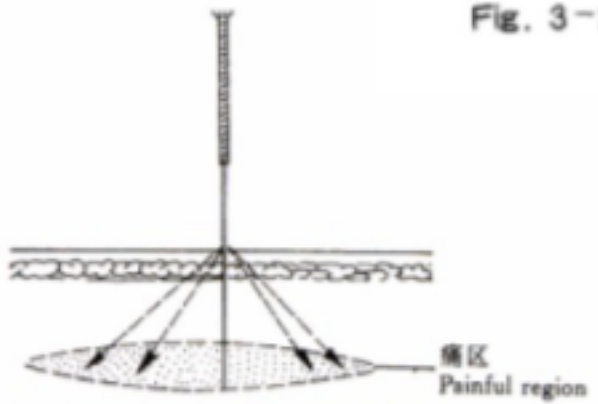


图3-29 合谷刺

Fig. 3-29 Hegu needling



恢刺

Rehabilitating needling

图3-28 关刺

Fig. 3-28 Joint needling

Comparing the Clinical Effect of 5 Varying Locations of LI4 (Hegu)

- There were 5 various location of LI4 with its identification of the acupoint location
- Comparing effect to:
  - Relief headache > toothache
  - Relief toothache > headache
  - Relief both headache and toothache
  - No relief headache or toothache
- Various location of LI4 produced different effects depending on a location where inserted needle takes place
- BDORT method found to have the highest therapeutic effect
  - BDORT ~ varies with individuals but within millimeters from traditional method of locating

Dominic Lu et al. Acupuncture and Electro-therapeutics Res. Int. J. Vol 33 pp 135-143, 2008.

Treatment

- Different diagnosis (pattern)
- Different treatment strategies, point selection
- Different insertion and manipulation (approach, technique, skill, modalities)

RESEARCH IN ACUPUNCTURE

Studies with no efficacy in acupuncture → Placebo-controlled RCT → Pharmaceutical

- Most acupuncture researches were done by “conventional” researchers
- Research focus for Acupuncture study → All aspects of the treatment approach

CONSORT 1996 → CONSORT Extension 2008 → STRICTA → CONSORT 2010

Begg et al 1996, Sabapathy et al 2006, Fonnebo et al 2007, Ritenbauch et al 2003, MacPherson et al 2010

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J Pain. 2018 May ; 19(5): 455–474. doi:10.1016/j.jpain.2017.11.005.

Acupuncture for chronic pain: update of an individual patient data meta-analysis

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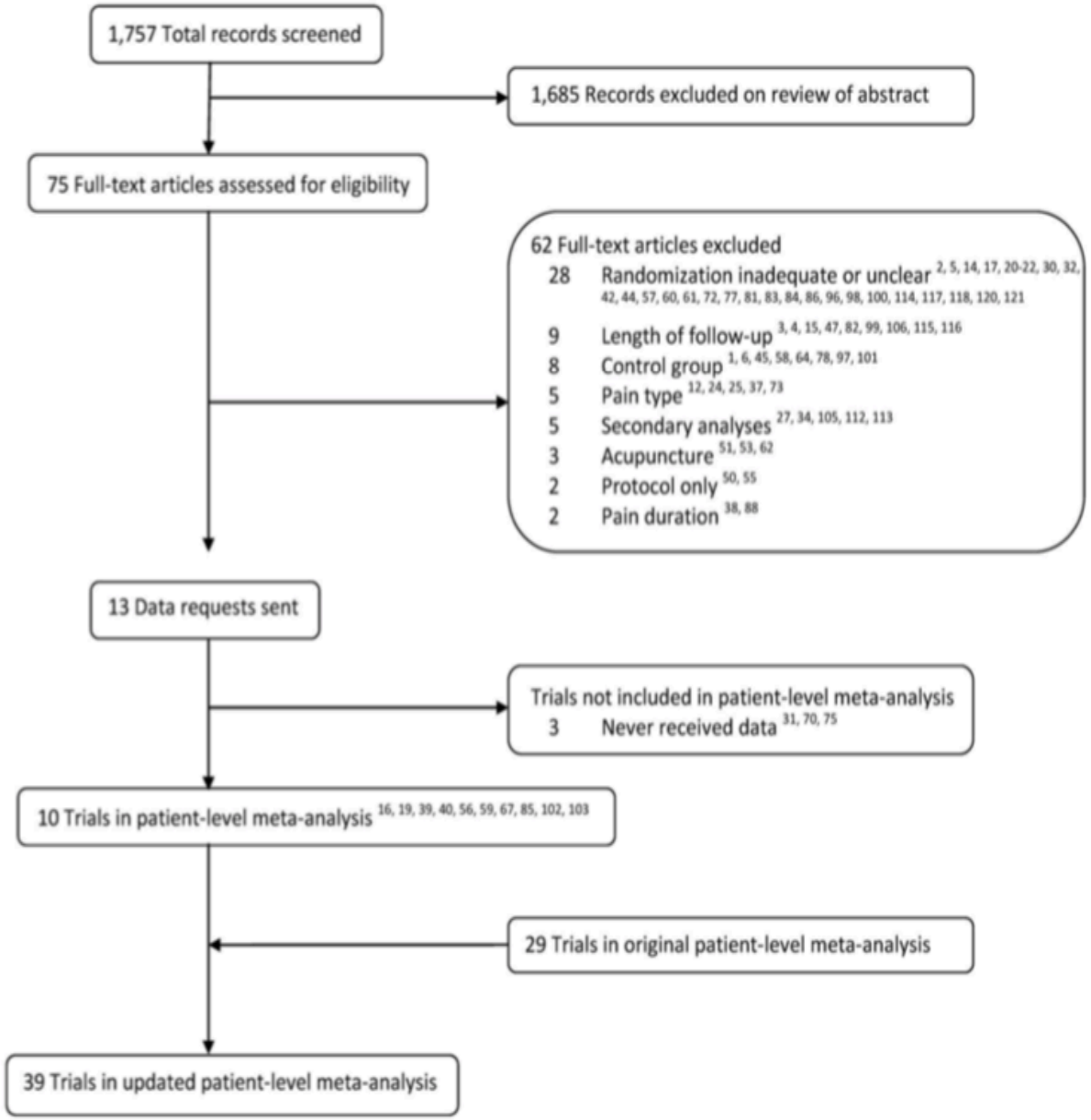
Klaus Linde, MD
Technical University Munich, Germany

on behalf of the Acupuncture Trialists' Collaboration

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram

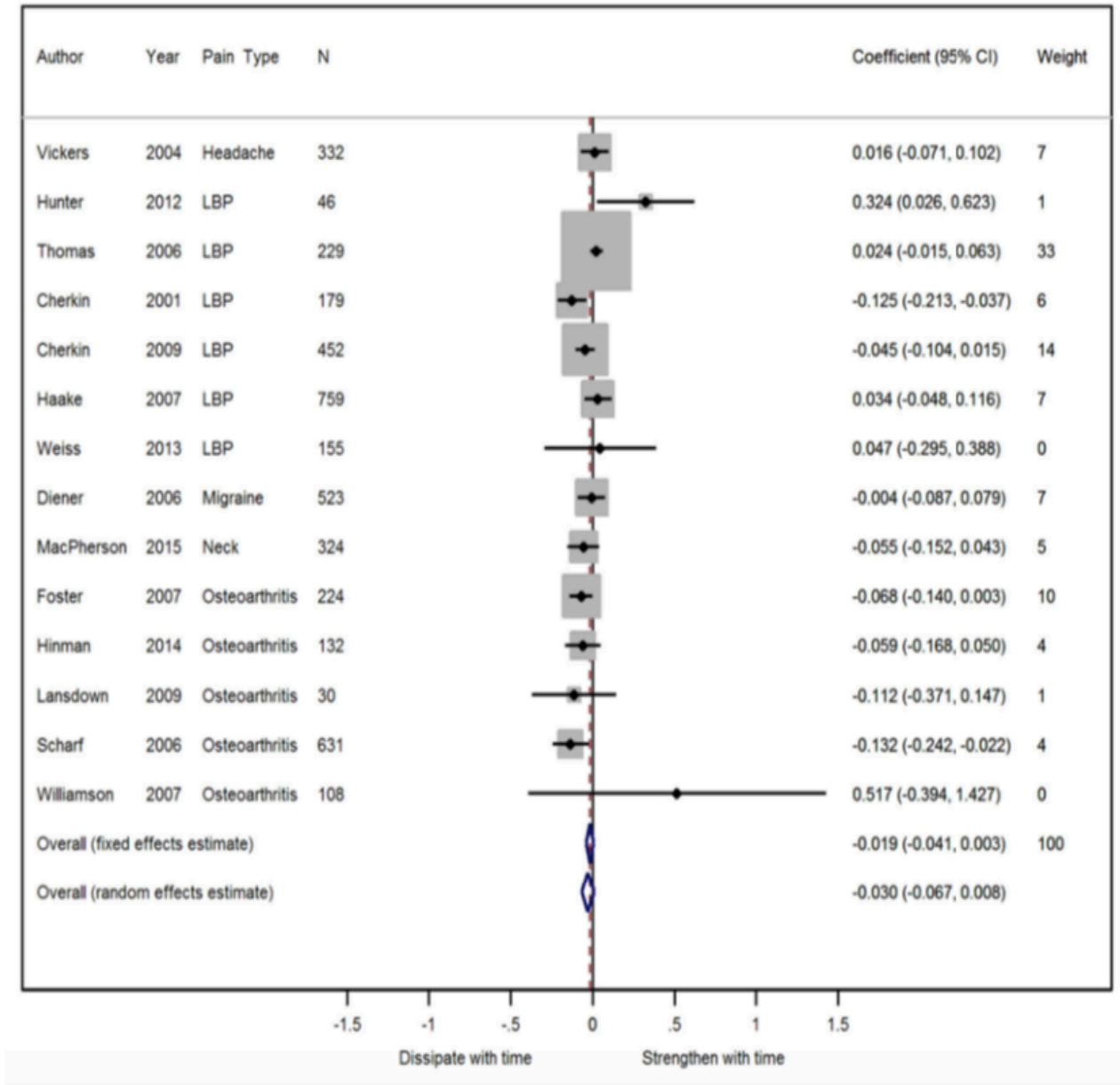


Vickers et al. J Pain. 2018 May ; 19(5): 455–474. doi:10.1016/j.jpain.2017.11.005.

Despite wide use in clinical practice, acupuncture remains a controversial treatment for chronic pain. Our objective was to update an individual patient data meta-analysis to determine the effect size of acupuncture for four chronic pain conditions. We searched MEDLINE and the Cochrane Central Registry of Controlled Trials randomized trials published up until December 31, 2015. We included randomized trials of acupuncture needling versus either sham acupuncture or no acupuncture control for non-specific musculoskeletal pain, osteoarthritis, chronic headache, or shoulder pain. Trials were only included if allocation concealment was unambiguously determined to be adequate. Raw data were obtained from study authors and entered into an individual patient data meta-analysis. The main outcome measures were pain and function. An additional 13 trials were identified, with data received for a total of 20,827 patients from 39 trials. Acupuncture was superior to both sham and no acupuncture control for each pain condition (all $p<0.001$) with differences between groups close to 0.5 standard deviations (SD) for comparison with no acupuncture control and close to 0.2 SDs in comparison with sham. We also found clear evidence that the effects of acupuncture persist over time with only a small decrease, approximately 15%, in treatment effect at one year. In secondary analyses, we found no obvious association between trial outcome and characteristics of acupuncture treatment, but effect sizes of acupuncture were associated with the type of control group, with smaller effects sizes for sham controlled trials that used a penetrating needle for sham, and for trials that had high intensity of intervention in the control arm. We conclude that acupuncture is effective for the treatment of chronic pain, with treatment effects persisting over time. While factors in addition to the specific effects of needling at correct acupuncture point locations are important contributors to the treatment effect, decreases in pain following acupuncture cannot be explained solely in terms of placebo effects. Variations in the effect size of acupuncture in different trials are driven predominately by differences in treatments received by the control group rather than by differences in the characteristics of acupuncture treatment.

Vickers et al. J Pain. 2018 May ; 19(5): 455–474. doi:10.1016/j.jpain.2017.11.005.

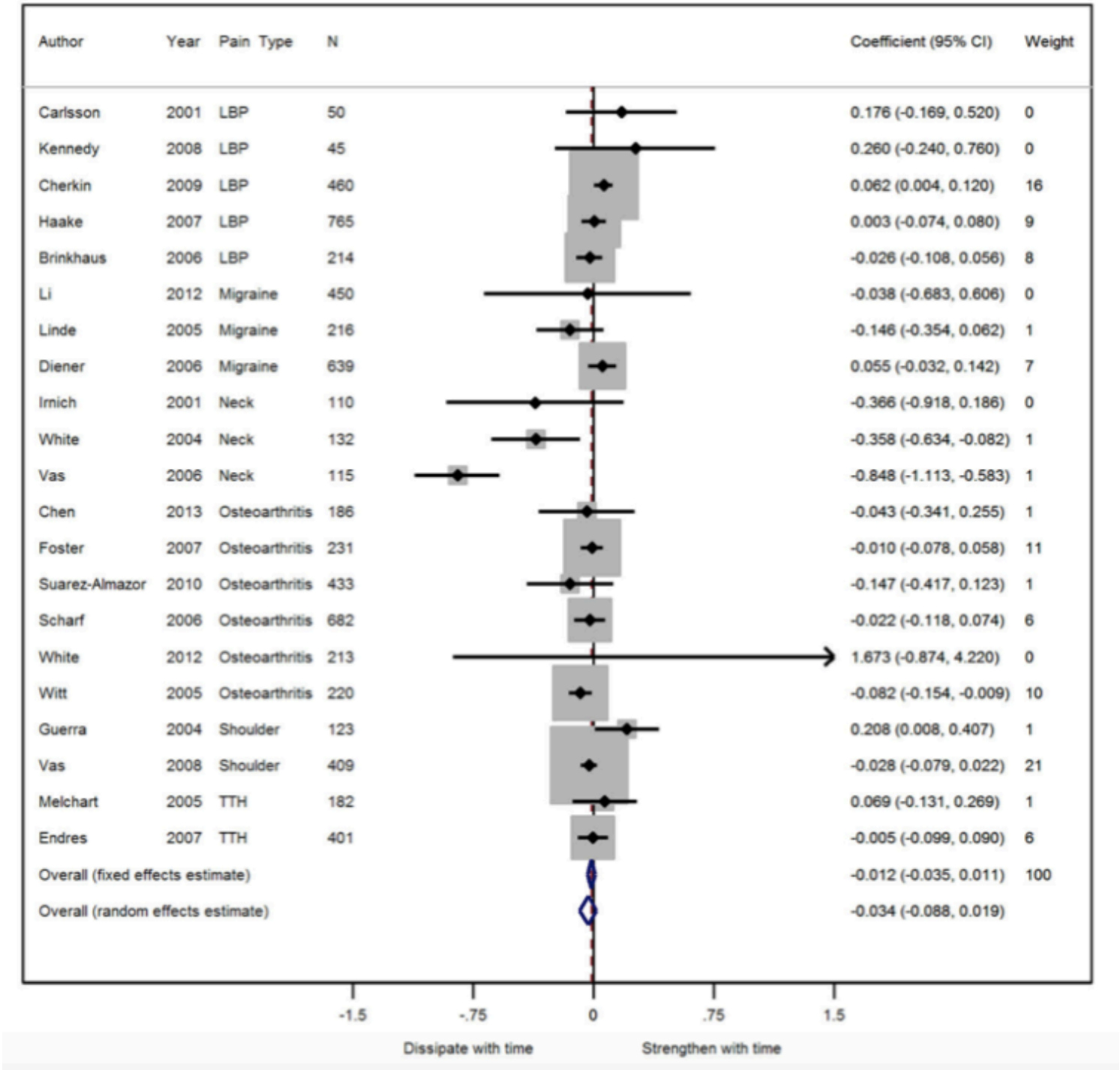
Acupuncture
VS
No Acupuncture



Vickers et al. J Pain. 2018 May ; 19(5): 455–474. doi:10.1016/j.jpain.2017.11.005.

Acupuncture VS Sham Acupuncture

Vickers et al. J Pain. 2018 May ; 19(5): 455–474. doi:10.1016/j.jpain.2017.11.005.



Main Analysis

Vickers et al. J Pain. 2018 May ; 19(5): 455–474. doi:10.1016/j.jpain.2017.11.005.

Primary Analyses, N=44 trials. Acupuncture is superior to control at p<0.001 except where indicated

		Sham				No acupuncture control			
Analysis	**Indication**	**No. of studies**	**FE (95% CI)**	**Heterogeneity p-value**	**RE (95% CI)**	**No. of studies**	**FE (95% CI)**	**Heterogeneity p-value**	**RE (95% CI)**
Main Analysis	Non-specific musculoskeletal pain	10	0.30 (0.21, 0.38)	p<0.001	0.49 (0.16, 0.81)	12	0.54 (0.50, 0.57)	p<0.001	0.50 (0.38, 0.63)
	Osteoarthritis	9	0.24 (0.17, 0.31)	p<0.001	0.45 (0.15, 0.75)	10	0.63 (0.56, 0.69)	p<0.001	0.74 (0.46, 1.01)
	Chronic headache	5	0.16 (0.08, 0.25)	p=0.4	0.16 (0.08, 0.25)	7	0.44 (0.39, 0.48)	p<0.001	0.56 (0.35, 0.76)
	Shoulder	4	0.57 (0.44, 0.69)	p=0.4	0.57 (0.44, 0.69)	0	No trials		

Sensitivity analyses including only pain endpoints measured between 2 and 3 months after randomization.

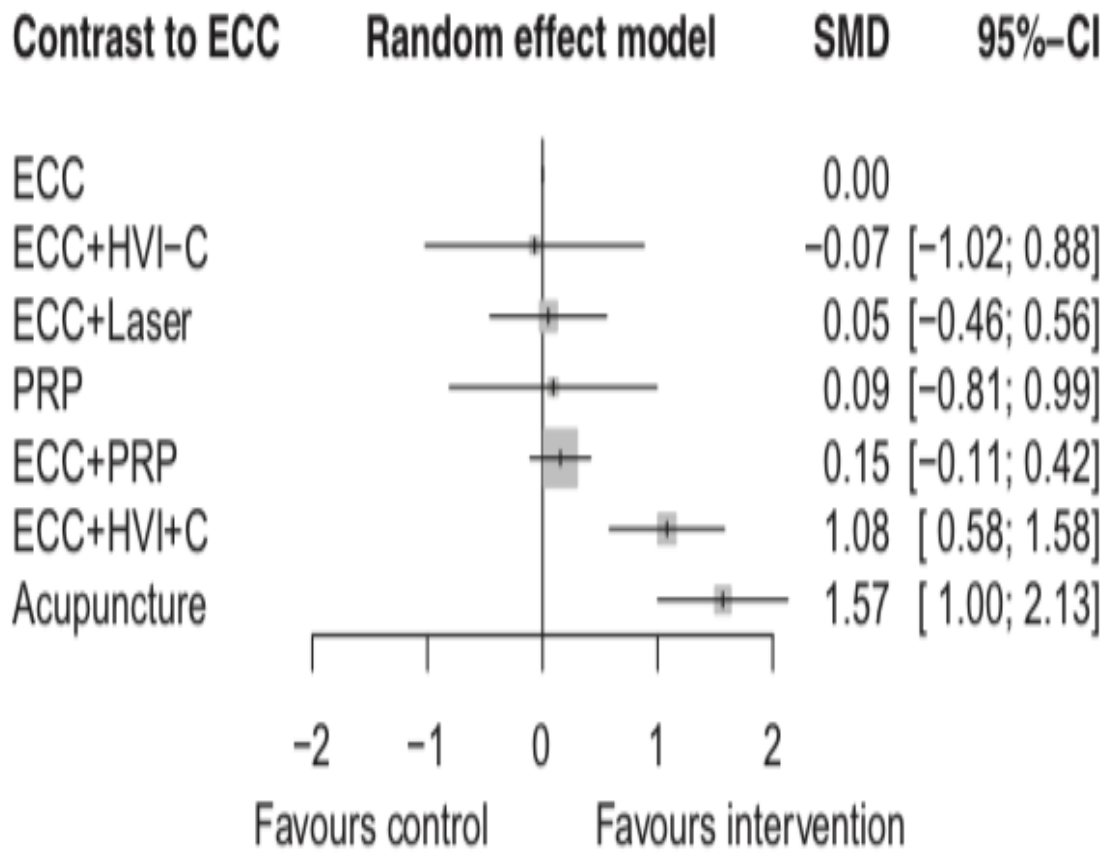
		Sham				No acupuncture control			
Analysis	**Indication**	**No. of studies**	**FE (95% CI)**	**Heterogeneity p-value**	**RE (95% CI)**	**No. of studies**	**FE (95% CI)**	**Heterogeneity p-value**	**RE (95% CI)**
Main Analysis	Non-specific musculoskeletal pain	5	0.13 (0.01, 0.25)	p=0.005	0.23 (−0.03, 0.49)	9	0.60 (0.56, 0.64)	p<0.0001	0.47 (0.34, 0.61)
	Osteoarthritis	7	0.31 (0.23, 0.39)	p<0.0001	0.69 (0.24, 1.14)	9	0.73 (0.66, 0.80)	p<0.0001	0.88 (0.61, 1.15)
	Chronic headache	5	0.14 (0.06, 0.22)	p=0.4	0.14 (0.06, 0.22)	7	0.43 (0.38, 0.47)	p<0.0001	0.45 (0.27, 0.63)
	Shoulder	2	No meta-analysis						

Comparative Efficacy and Tolerability of Nonsurgical Therapies for the Treatment of Midportion Achilles Tendinopathy

A Systematic Review With Network Meta-analysis

Hye Chang Rhim,* MD, Min Seo Kim,† MD, Seungil Choi,‡ BS, and Adam S. Tenforde,§|| MD
Investigation performed at Korea University College of Medicine, Seoul, Republic of Korea

Compared with ECC, acupuncture showed benefits over both the short term (SMD, 1.57; 95% CI, 1.00-2.13) and longer term (SMD, 1.23; 95% CI, 0.69-1.76)



The Orthopaedic Journal of Sports Medicine, 8(7), 232596712093056 7 DOI: 10.1177/232596712093056 7

Overview of Treatment Guidelines and Clinical Practical Guidelines That Recommend the Use of Acupuncture: A Bibliometric Analysis

Stephen Birch, PhD,[1] Myeong Soo Lee, PhD,[2] Terje Alraek, PhD,[1,3] and Tae-Hun Kim, PhD[4]

Results: A total of 1311 publications were found that recommended using acupuncture published between 1991 and 2017. The number per year reached 50 in 2005 and 100 in 2009. In addition, 2189 positive recommendations were found for the use of acupuncture. Of these, 1486 were related to 107 pain indications and 703 were related to 97 non pain indications. These recommendations were made by a wide range of groups, such as government health institutions, national guideline, and medical specialty groups. The recommendations came from around the world but were especially abundant in North America, Europe, and Australasia.

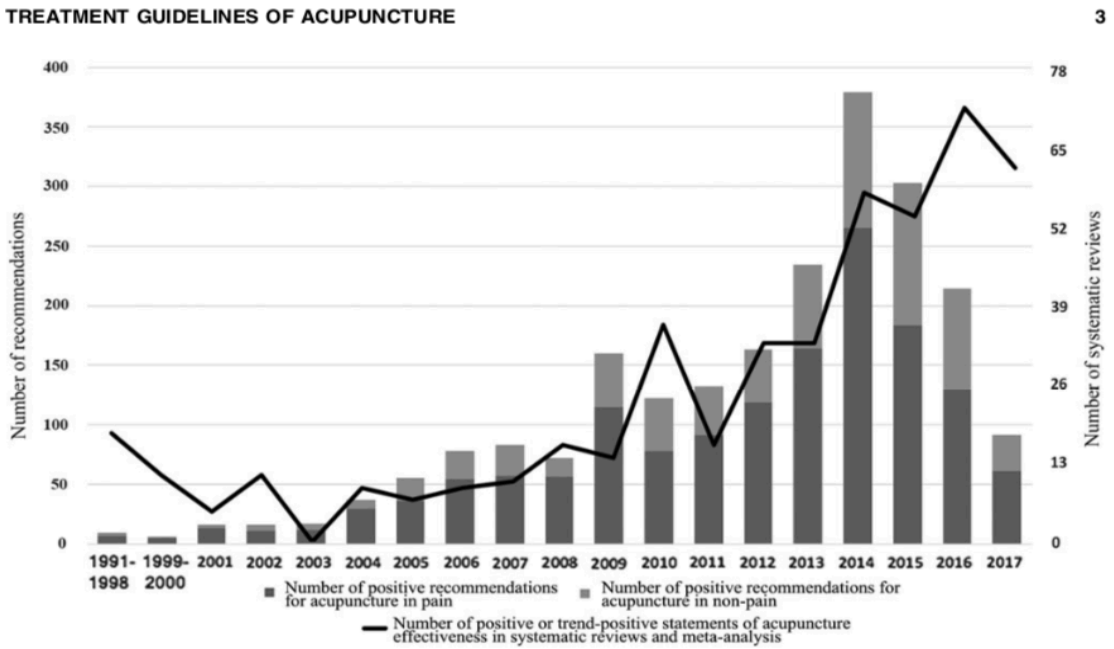


FIG. 1. Number of positive or trend-positive statements in review articles of acupuncture effectiveness as the line graph and number of recommendations by year through August 31, 2017 as the bar graph.

Birch S et al. JACM. Vol. 00, No. 00, 2018. pp. 1-18.

CAM is generally addressed in terms of procedures (modalities or therapies) in research and policy

Herman P et al. RAND 2015 Report.
https://www.rand.org/pubs/research_reports/RR1258.html

Policies Where Profession Versus Procedure Makes a Difference

- Licensure
- Healthcare Coverage
- Workforce
- Regulatory Practice Constraints
- Research

https://www.rand.org/pubs/research_briefs/RB9894.html#:~:text=Complementary%20and%20alternative%20medicine%20%28CAM%29%20practitioners%20such%20as,as%20purveyors%20of%20a%20limited%20set%20of%20procedures.

RESEARCH HIGHLIGHT

Advancing Complementary and Alternative Medicine Professions

Practitioners Face Many Policy Hurdles to Finding Their Place in Mainstream Medicine

Key findings:

- In policy and research, practitioners of complementary and alternative medicine (CAM) are often treated as purveyors of a limited set of procedures, even though they are legally recognized as health care professionals capable of providing a broad range of primary care.
- This situation reduces patient access to care.
- The focus on procedures presents a number of barriers to the full incorporation of CAM professionals into integrative patient care teams.
- To advance the CAM professions and include them in integrative care, a number of policy changes are required to remove the barriers and improve patient outcomes.

https://www.rand.org/pubs/research_briefs/RB9894.html#:~:text=Complementary%20and%20alternative%20medicine%20%28CAM%29%20practitioners%20such%20as,as%20purveyors%20of%20a%20limited%20set%20of%20procedures.

CA Board Occupational Analysis 2021

FIGURE 6 – PRIMARY PRACTICE SETTING

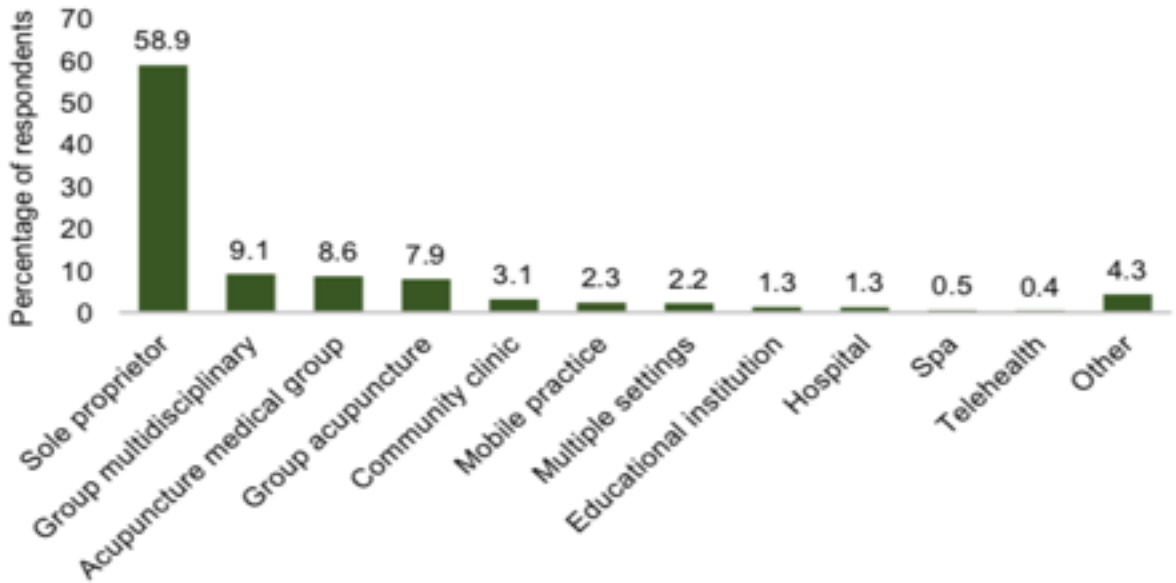
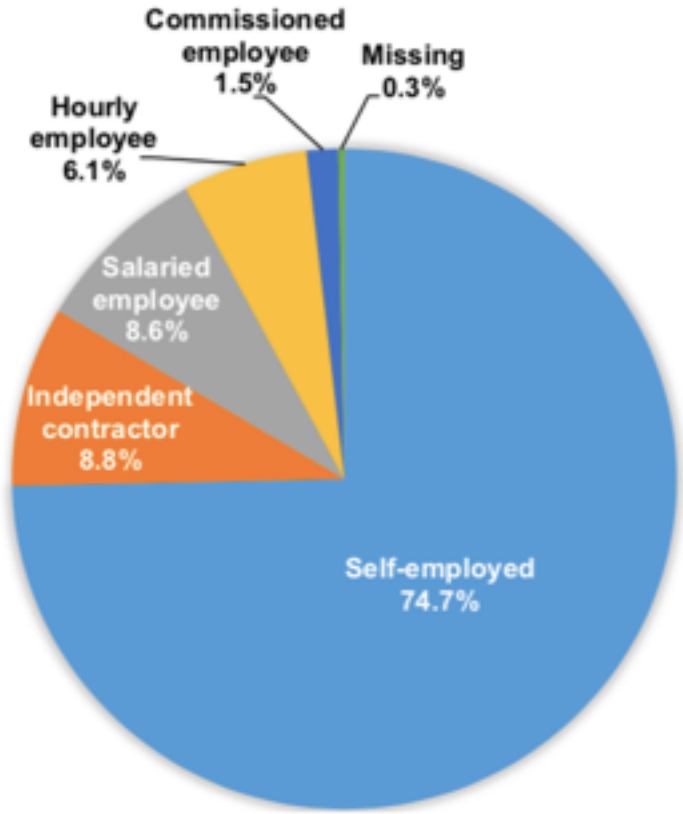
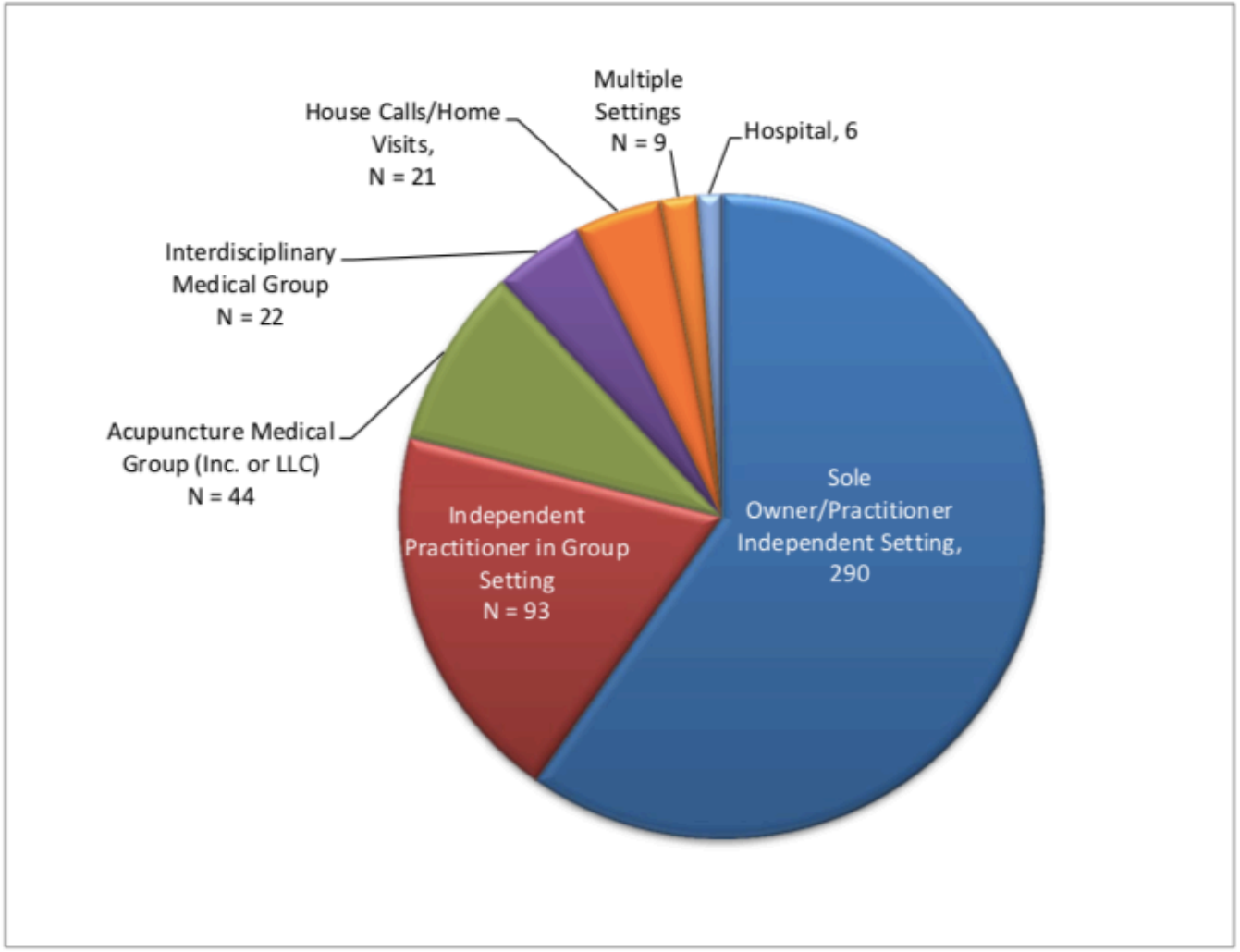


FIGURE 7 – EMPLOYMENT STATUS



https://acupuncture.ca.gov/about_us/materials/2021_occanalysis.pdf

PRIMARY PRACTICE SETTING – CAB 2015 OA



https://acupuncture.ca.gov/pubs_forms/other_pubs.shtml

CA Board Occupational Analysis 2021

FIGURE 20 – CHANGE IN RESPONDENTS' INCOME DUE TO THE COVID-19 PANDEMIC

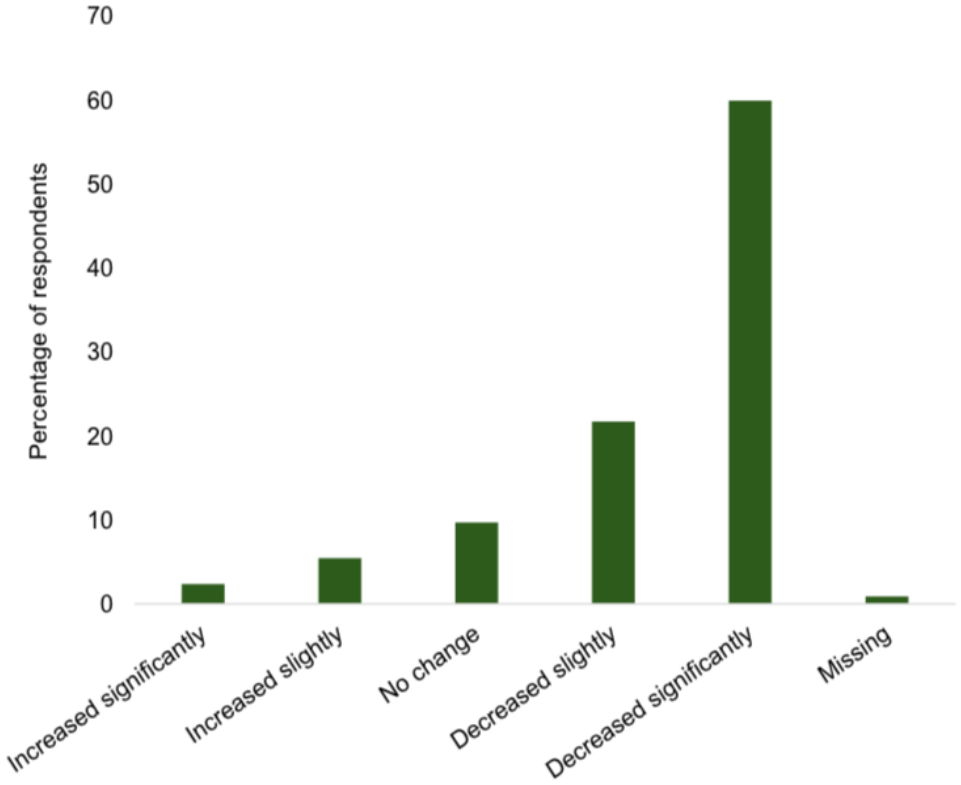
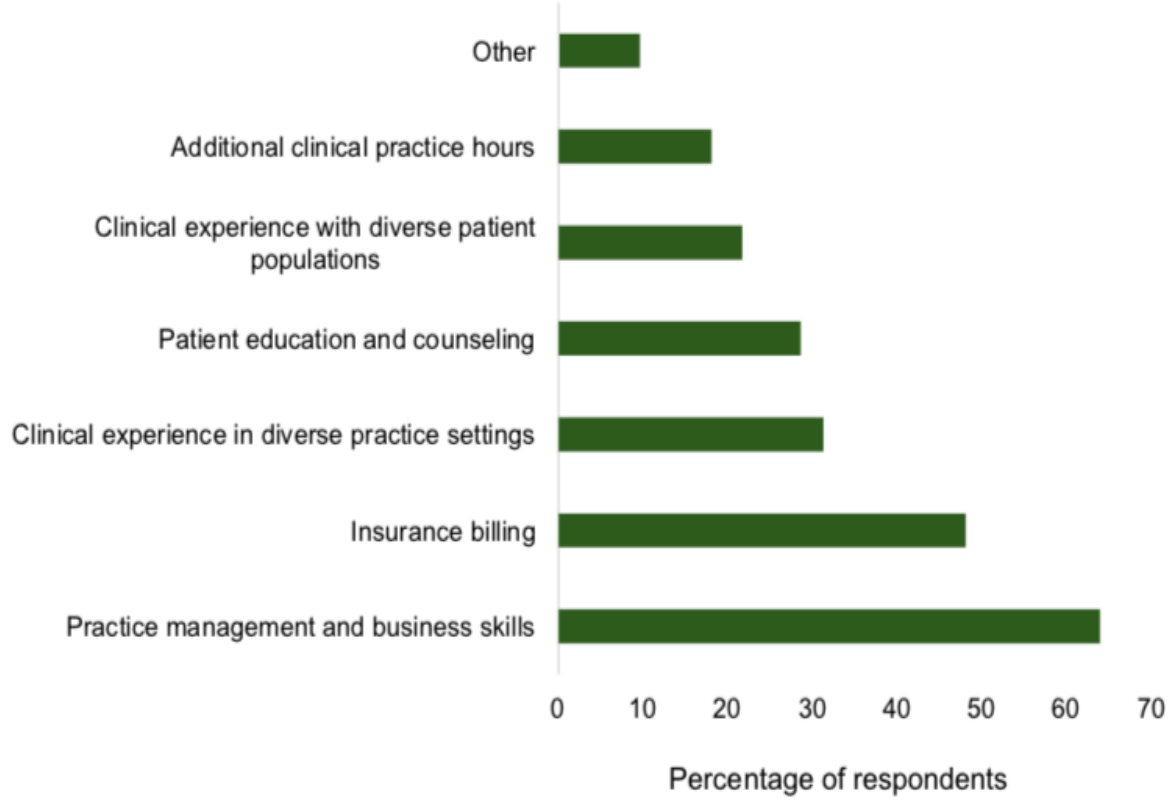


FIGURE 22 – SUBJECTS THAT WOULD HAVE BEEN BENEFICIAL FOR ADEQUATE PREPARATION FOR FIRST YEAR IN PRACTICE

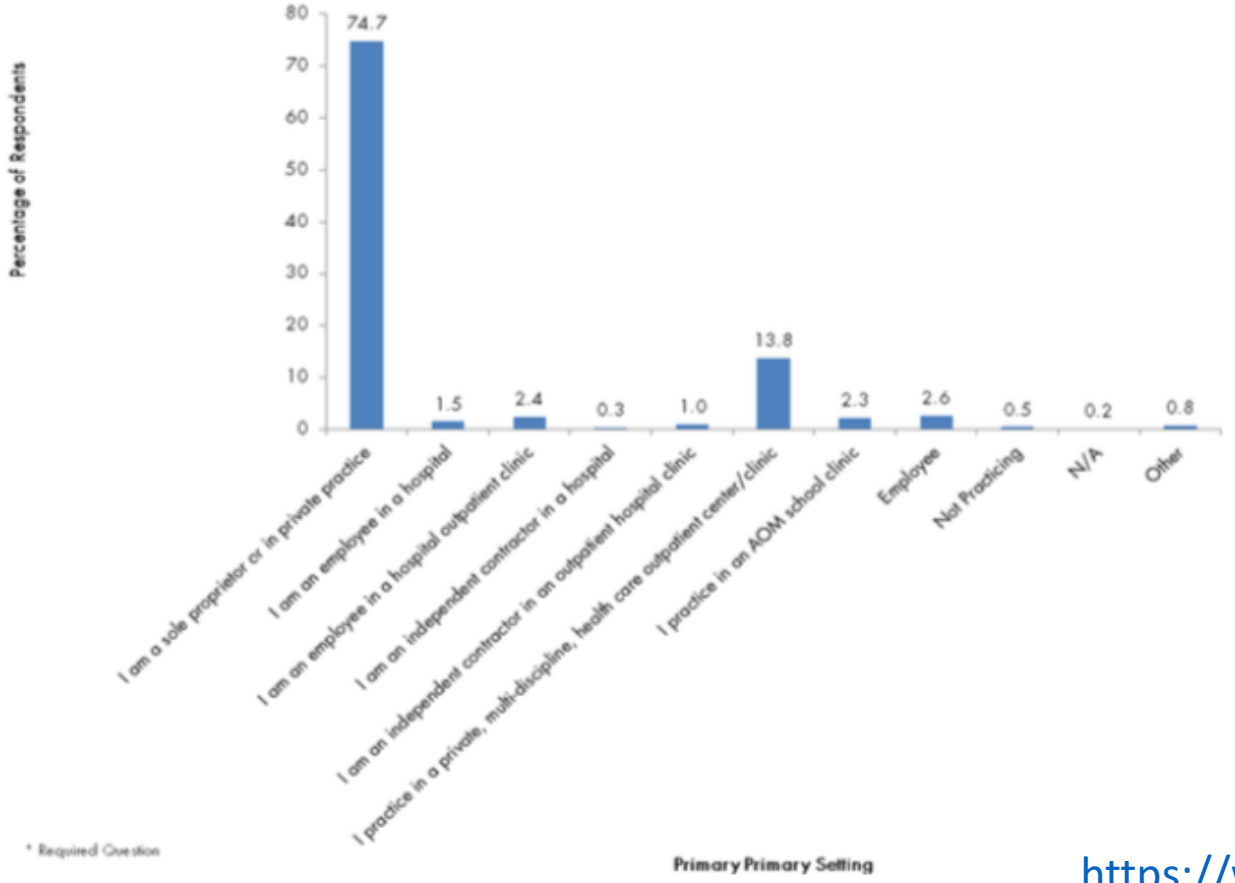


https://acupuncture.ca.gov/about_us/materials/2021_occanalysis.pdf

NCCAOM Job Task Analysis 2017

Graph 12: Primary Practice Setting

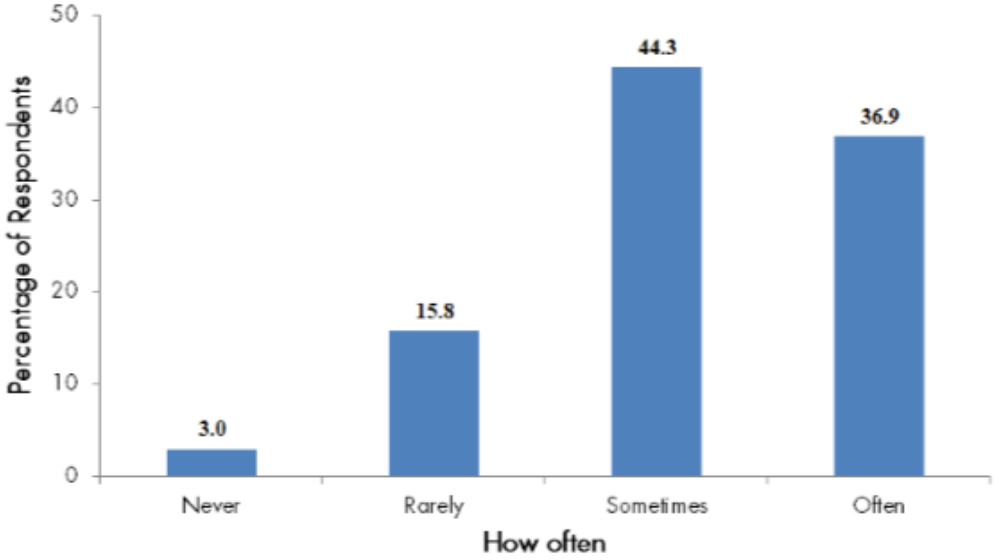
If you are providing direct patient care, which of the following do you consider your primary practice setting?



* Required Question

Graph 15: Use of Evidence-based Research to Inform Practice

How often do you use evidence-based research to inform your practice? (e.g., journal articles, textbooks, PubMed)



*Key: Never, Rarely, Often, Very Often

https://www.nccaom.org/certification/jasurvey/

Digesting for Solutions

- Professional Identity Formation
- Standard of competency
- Agenda for educational alignment plan in curriculum framework
- Structure for professional engagement

What is Traditional Medicine?

- Chinese [Traditional] medicine is a coherent and independent system of thought and practice that has been developed over two millennia.
- Based on ancient texts, it is the result of a continuous process of critical thinking, as well as extensive clinical observation and testing.

--Ted Kaptchuk, *The Web That Has No Weaver*

Stomach Pain – Biomedicine filter

- 6 patients, stomach pain
- Upper GI x-rays or endoscopy (fiberscope)
- Stomach pain due to peptic ulcer disease

- *The Web that Has No Weaver, Ted Kaptchuk, 2000, pp 4-7*
- *Clinical Observations of Trad Chin Med Approaches to 65 cases of ulcers, JTCM, June 1959, pp 30-33*
- *Typing of Peptic Ulcer Disease according to Trad Chin Med and Preliminary Exploration of its Pathological Basis, JTCM, Feb 1980, pp 17-21*
- *The Research Report "Analysis of Effectiveness of TCM in treating 126 cases of gastrointestinal ulcers, JTCM, Feb 1960*

1st Patient – Traditional Medicine filter

- Stomach pain
- Pain >> at touch (palpation) but << with cold compression
- Robust constitution, broad shoulders, reddish complexion, full, deep voice
- Assertive, even aggressive, seems to challenge doctor
- Constipated, dark yellow urine
- Yellow greasy tongue coating
- Pulse is full and wiry
- **Damp heat affecting spleen**

- *The Web that Has No Weaver, Ted Kaptchuk, 2000, pp 4-7*
- *Clinical Observations of Trad Chin Med Approaches to 65 cases of ulcers, JTCM, June 1959, pp 30-33*
- *Typing of Peptic Ulcer Disease according to Trad Chin Med and Preliminary Exploration of its Pathological Basis, JTCM, Feb 1980, pp 17-21*
- *The Research Report "Analysis of Effectiveness of TCM in treating 126 cases of gastrointestinal ulcers, JTCM, Feb 1960*

2nd Patient – Traditional Medicine filter

- Stomach pain
- Patient is thin, complexion is ashen, ruddy cheeks
- Constantly thirsty, sweaty palms, tendency toward constipation, insomnia
- Nervous, fidgety, unable to relax, complains of feeling pressured, constantly on the go and has been unable to be in stable relationship
- Tongue is dry, slightly red, no moss
- Pulse is thin, a bit fast
- **Deficiency yin affecting stomach**

- *The Web that Has No Weaver, Ted Kaptchuk, 2000, pp 4-7*
- *Clinical Observations of Trad Chin Med Approaches to 65 cases of ulcers, JTCM, June 1959, pp 30-33*
- *Typing of Peptic Ulcer Disease according to Trad Chin Med and Preliminary Exploration of its Pathological Basis, JTCM, Feb 1980, pp 17-21*
- *The Research Report "Analysis of Effectiveness of TCM in treating 126 cases of gastrointestinal ulcers, JTCM, Feb 1960*

3rd Patient – Traditional Medicine filter

- Stomach pain
- Massage and heat somewhat alleviate his pain, experienced as a minor but persistent discomfort, temporarily relieved by eating
- Dislikes cold weather, wants to sleep a lot
- Clear, frequent urination
- Pale face, timid, shy, almost afraid, seems unable to look physician in the eye, head seems to hang in despair
- Tongue is moist, pale
- Empty pulse
- **Exhausted fire of Middle Burner**

- *The Web that Has No Weaver, Ted Kaptchuk, 2000, pp 4-7*
- *Clinical Observations of Trad Chin Med Approaches to 65 cases of ulcers, JTCM, June 1959, pp 30-33*
- *Typing of Peptic Ulcer Disease according to Trad Chin Med and Preliminary Exploration of its Pathological Basis, JTCM, Feb 1980, pp 17-21*
- *The Research Report "Analysis of Effectiveness of TCM in treating 126 cases of gastrointestinal ulcers, JTCM, Feb 1960*

4th Patient – Traditional Medicine filter

- Stomach pain
- Very severe cramping pain
- Movement and affect is ponderous and heavy
- Hot-water bottles relieve pain, but massaging the abdomen makes it worse
- Tendency towards loose stools
- Bright white face
- 40 yrs old and came to appointment with his mother with whom he still lives, his passion is world class stamp collection which he constantly study and want to talk about
- Tongue has thick, white, moist coating
- Pulse is tight, slippery
- **Excess cold dampness affecting SP/ST**

- *The Web that Has No Weaver, Ted Kaptchuk, 2000, pp 4-7*
- *Clinical Observations of Trad Chin Med Approaches to 65 cases of ulcers, JTCM, June 1959, pp 30-33*
- *Typing of Peptic Ulcer Disease according to Trad Chin Med and Preliminary Exploration of its Pathological Basis, JTCM, Feb 1980, pp 17-21*
- *The Research Report "Analysis of Effectiveness of TCM in treating 126 cases of gastrointestinal ulcers, JTCM, Feb 1960*

5th Patient – Traditional Medicine filter

- Stomach pain
- Sharp pain, although massaging abdomen makes it diminish, heat and cold have no effect
- Sour belching and has headaches
- Very moody, emotional distress, esp anger, seems to precipitate attacks pain
- Frustrated, stuck in many of her life activities, during discussion she says her husband is distant and detached, strangely enough
- Normal tongue
- Wiry pulse
- **Disharmony of Liver invading spleen**

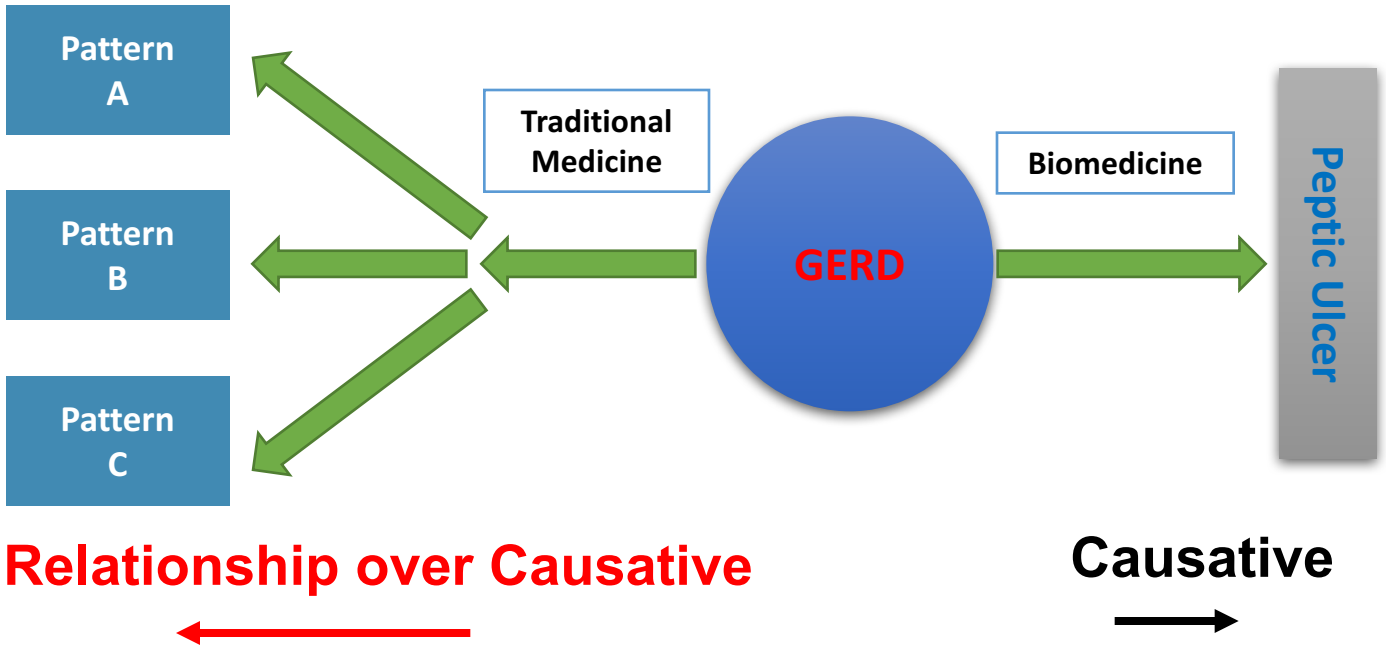
- *The Web that Has No Weaver, Ted Kaptchuk, 2000, pp 4-7*
- *Clinical Observations of Trad Chin Med Approaches to 65 cases of ulcers, JTCM, June 1959, pp 30-33*
- *Typing of Peptic Ulcer Disease according to Trad Chin Med and Preliminary Exploration of its Pathological Basis, JTCM, Feb 1980, pp 17-21*
- *The Research Report "Analysis of Effectiveness of TCM in treating 126 cases of gastrointestinal ulcers, JTCM, Feb 1960*

6th Patient – Traditional Medicine filter

- Stomach pain
- Extreme stabbing pain in the stomach that sometimes goes around to his back, pain much worse after eating, aggravated by touch
- Has had episodes of vomiting blood, produces blackish stools
- Very thin and has rather dark complexion
- His eyes furtively and suspiciously dart around the room, as if to detect a hidden threat
- Has been physically abused as a political prisoner
- Tongue is dark purple, has markedly red eruptions on the sides
- Pulse is choppy
- **Disharmony of congealed blood in the stomach**

- *The Web that Has No Weaver, Ted Kaptchuk, 2000, pp 4-7*
- *Clinical Observations of Trad Chin Med Approaches to 65 cases of ulcers, JTCM, June 1959, pp 30-33*
- *Typing of Peptic Ulcer Disease according to Trad Chin Med and Preliminary Exploration of its Pathological Basis, JTCM, Feb 1980, pp 17-21*
- *The Research Report "Analysis of Effectiveness of TCM in treating 126 cases of gastrointestinal ulcers, JTCM, Feb 1960*

Traditional Medicine vs Biomedicine



Traditional Medicine

- Considers important aspects of the human body and personality that are not significant to Western Medicine
- Uses terminology that is strange to Western ear (ie: Refer to certain diseases being generated by dampness, heat, wind)

--Ted Kaptchuk, *The Web That Has No Weaver*

Traditional Medicine vs Biomedicine

Traditional Medicine

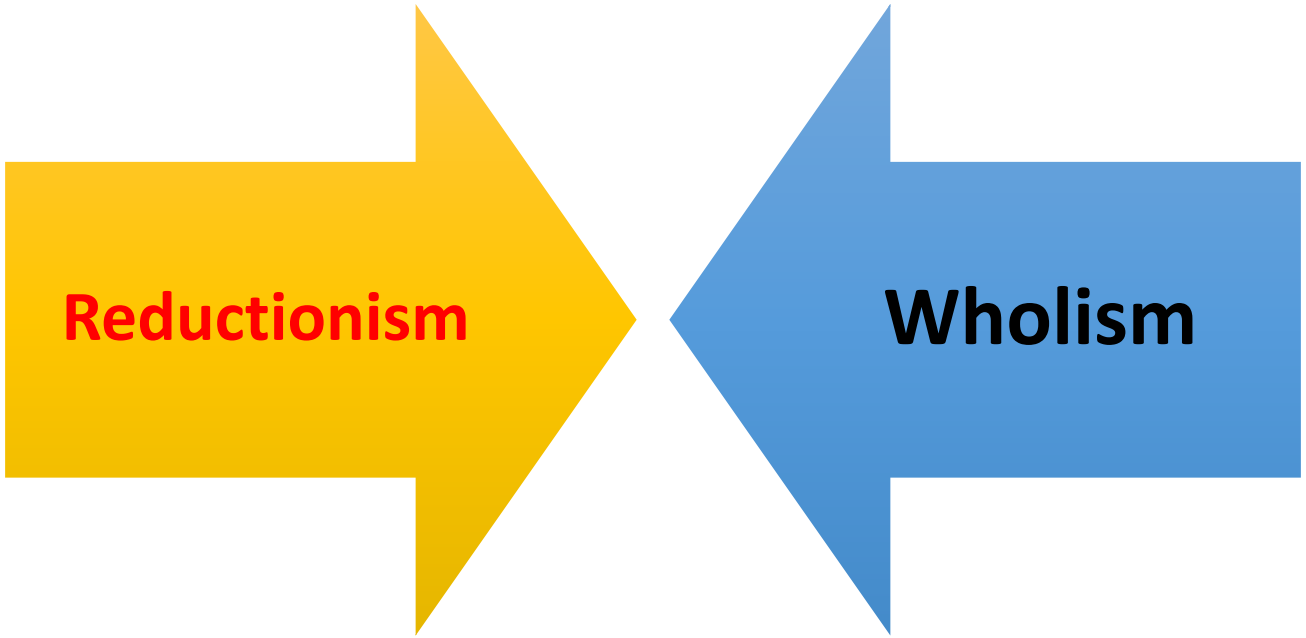
- What is the relationship between X and Y ?
- All relevant information, including symptom as well as patient's other general characteristics are gathered and woven together
- Pattern of disharmony (describing situation of imbalance in patient's body)

Biomedicine

- What X is causing Y ?
- Primary concern in isolable disease categories or agents of disease, which is zeroes in on, isolates, and tries to change, control, destroy
- Symptoms – Precise cause – specific disease

--Ted Kaptchuk, *The Web That Has No Weaver*

What is the problem found in these 2 Diagnosis System ?



Biomedicine

- Newtonian view ~ reductionism
- Eliminates distraction of all confusing interactions at macroscopic level, dissect the component parts, to reach the truth
- Understanding all parts of human system, understand the whole
- Unable to provide a three-dimensional model

What is water ?

- Temperature influences our interpretation of a ”water”
  - > 212 F ~ steam
  - 32 – 212 F ~ water
  - < 32 F ~ ice

https://medicalxpress.com/news/2018-09-theory-phantom-limb-pain-effective.html

https://www.uniteprofessionals.co.uk/guide-phantom-limb-pain-amputees/

Stress Response and Development of Allostatic Load

- Factor from the Individual differences (genes, development, experiences)
- Perceived stress (threat, helplessness, vigilance), environmental stressors, major life events, trauma, abuse
- Affect the behavioral responses (personal behavior, fight, flight)
- Influences physiologic responses to the stress (adaptation from the allostatic load)

McEwen BS. Protective and damaging effects of stress mediators. N Engl J Med 338: 171-9

Patient-Centered Care

https://catalyst.nejm.org/doi/full/10.1056/CAT.17.0559

A Scoping Review on Models of Integrative Medicine: What Is Known from the Existing Literature?

Eun Jin Lim, MPH,[1] Janette L. Vardy, PhD, MD,[1,2]
Byeong Sang Oh, PhD,[3] and Haryana M. Dhillon, PhD[4]

Lim et al. JACM. Volume 00, Number 0, 2016, pp. 1–10. DOI: 10.1089/acm.2016.0263

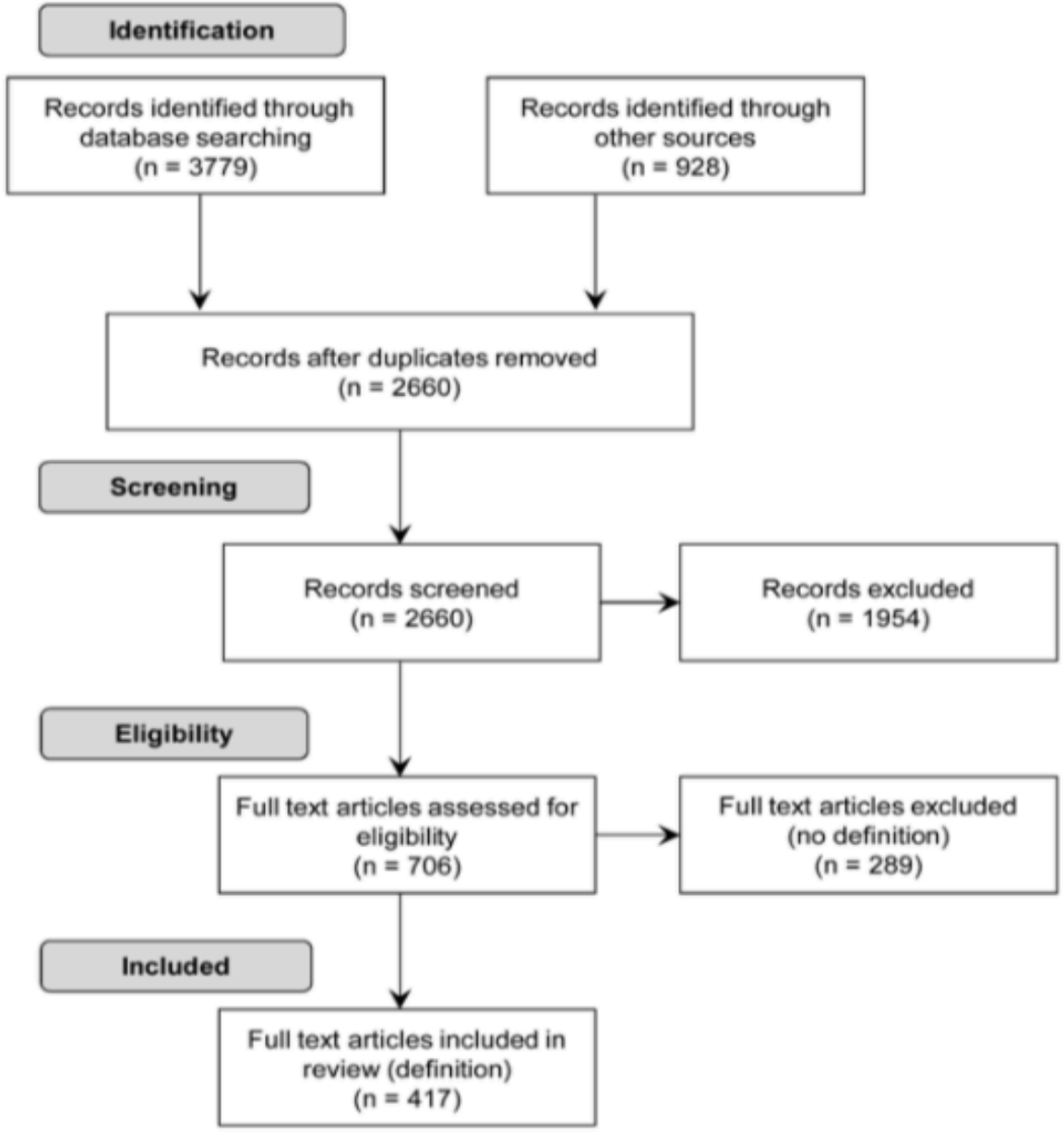
Models of Integrative Medicine

- To evaluate IM models in the extant literature
- Understanding core requirements needed to develop models of integrative medicine best meet the needs of patients
- 1374 articles identified, 45 studies were included
- The philosophy of CAM is recognized in the patient-centered care model
- Requiring collaboration between medical disciplines based on the needs from patient
- Integrative Medicine model is focused on the patient, instead of providers, with independent and integrative systems

Lim et al. JACM. Volume 00, Number 0, 2016, pp. 1–10. DOI: 10.1089/acm.2016.0263

Existing models of patient-centeredness reveal a lack of conceptual clarity

- To identify the different dimensions of patient-centeredness
- To propose an integrative model of patient-centeredness



Scholl et al. PLoS ONE 9(9): e107828.

15 Dimensions in patient-centeredness

1. Essential characteristics of the clinician
2. Clinician-patient relationship
3. Clinician-patient communication
4. Patient as a unique person
5. Biopsychosocial perspective
6. Patient information
7. Patient involvement in care
8. Involvement of family and friends
9. Patient empowerment
10. Physical support
11. Emotional support
12. Access to care
13. Integration of medical and non-medical care
14. Coordination and continuity of care
15. Teamwork and teambuilding

Scholl et al. PLoS ONE 9(9): e107828.

Validation and Prioritization of 15 Dimensions in Patient-centeredness

- 2-round web-based Delphi study
- 297 international experts
- Round 1:
  - Give an individual rating on a nine-point- scale on relevance and clarity of the dimensions
  - Add missing dimensions
  - Prioritize the dimensions
- Round 2:
  - Experts received feedback about the results of round one and were asked to reflect and re-rate their own results
- The cut-off for the validation of a dimension was a median < 7 on one of the criteria

Zill JM et al. PLoS ONE 10(11): e0141978.

5 Dimensions rated as the most important

- Patient as a unique person
- Patient involvement in care
- Patient information
- Clinician-patient communication
- Patient empowerment

Zill JM et al. PLoS ONE 10(11): e0141978.

What Can We Learn? Primary Focus

- Competency in ”Patient care" and ”Professional practice"
- Pain should receive center attention in the core competency of the knowledge and skills application of patient care in the acupuncture curriculum
- The ability to analyze and perform the effective treatment within scope of practice that integrate with the system and collaboration should become a primary model adopted in the curriculum
- The education model that focus on ‘Integrative Medicine’ in alignment with ‘Patient-centered care’
- The focus of the education in the acupuncture field should also be put into the setting of private practice

Challenge to Medical Education

- 20th Century → Flexnerian Revolution
- Exposure of poor educational content and processes in the early 1900s captured public attention and concern
- Accountability and responsibility to the public for the competency of practicing physicians have become a driving force

Flexner A. Medical Education in the United States and Canada. A Report to the Carnegie Foundation for the Advancement of Teaching. Bulletin No. 4. Boston, MA: Updyke, 1910

Shifting to Competency Based Medical Education

- Structure- and process-based system
  - Training experience by exposure to specific contents for specified periods of time (e.g., one month of adolescent medicine)

- Competency-based system
  - The desired outcome of training, the outcome driving the educational process (e.g., competence in the care of adolescent patients)

CARRACCIO ET AL. ACADEMIC MEDICINE, VOL. 77, NO. 5 / MAY 2002

A Comparison of the Elements of Structure- and Process-based Versus Competency-based Educational Programs

Variable	Educational Program	
	Structure- and Process-based	Competency-based
Driving force for curriculum	Content—knowledge acquisition	Outcome—knowledge application
Driving force for process	Teacher	Learner
Path of learning	Hierarchical (teacher ⇒ student)	Non-hierarchical (teacher ⇔ student)
Responsibility for content	Teacher	Student and teacher
Goal of educational encounter	Knowledge acquisition	Knowledge application
Typical assessment tool	Single subjective measure	Multiple objective measures ("evaluation portfolio")
Assessment tool	Proxy	Authentic (mimics real tasks of profession)
Setting for evaluation	Removed (gestalt)	"In the trenches" (direct observation)
Evaluation	Norm-referenced	Criterion-referenced
Timing of assessment	Emphasis on summative	Emphasis on formative
Program completion	Fixed time	Variable time

CARRACCIO ET AL. ACADEMIC MEDICINE, VOL. 77, NO. 5 / MAY 2002

NCCAOM

- 4 Separate Exams:
  - TCM Foundation Modules
  - Acupuncture Modules
  - Herbs Modules
  - Biomedicine Modules

- Structural-Knowledge Based
  - Content (Knowledge) Focus

https://www.nccaom.org/certification/becoming-certified/

CALE

- 1 Exam:
  - Patient Assessment
  - Diagnostic Impression and Treatment Plan
  - Providing Acupuncture Treatment
  - Herbal Therapy
  - Regulations for Public Health and Safety

- Competency Based
  - Real-time Practice (Outcome) Focus

https://www.acupuncture.ca.gov/students/examination.shtml

CA Occupational Analysis 2021

TABLE 24 – RELIABILITY OF TASK FREQUENCY AND IMPORTANCE RATING SCALES BY CONTENT AREA AND OVERALL

CONTENT AREA	NUMBER OF STATEMENTS	α FREQUENCY	α IMPORTANCE
01. Patient assessment	43	.956	.961
02. Diagnosis and treatment planning	25	.921	.934
03. Treatment	71	.953	.962
04. Professional responsibilities	19	.838	.900
Overall*	158	.976	.981

*NOTE: Ratings for all task statements were included in the reliability analysis.

TABLE 25 – RELIABILITY OF KNOWLEDGE IMPORTANCE RATING SCALE BY CONTENT AREA AND OVERALL

CONTENT AREA	NUMBER OF STATEMENTS	α IMPORTANCE
01. Patient assessment	59	.983
02. Diagnosis and treatment planning	28	.974
03. Treatment	93	.984
04. Professional responsibilities	20	.973
Overall*	200	.992

*NOTE: Ratings for all knowledge statements were included in the reliability analysis.

https://acupuncture.ca.gov/about_us/materials/2021_occanalysis.pdf

NCCAOM Job Task Analysis

- Elements Sorted by Mean Importance in:
  - TCM Foundation
  - Acupuncture
  - Chinese Herbology
  - Biomedicine
  - Asian Body Work Therapy

- Structural-Knowledge Based
  - Content (Knowledge) Focus

https://www.nccaom.org/certification/jasurvey/

CA Occupational Analysis

- Task-Knowledge Linked to:
  - Patient Assessment
  - Diagnostic and Treatment Planning
  - Treatment
  - Professional Responsibilities

- Competency Based
  - Real-time Practice (Outcome) Focus

https://acupuncture.ca.gov/about_us/materials/2021_occanalysis.pdf

Challenge to Curriculum Development

- Getting to where we want to be in a competency- based model has all the hallmarks of an adaptive challenge
- Shared language is important in leading adaptive change
  - Communicate more effectively
  - Minimize misunderstandings
  - Gain the sense of being on the same page

Heifetz R, Linsky M, Grashow A. 2009. The practice of adaptive leadership: tools and tactics for changing your organization and the world. Boston: Cambridge Leadership Associates.

Table 1 CanMEDS and ACGME core competencies

CanMEDS	ACGME
• Medical expert	• Medical knowledge
• Communicator	• Communication and interpersonal skills
• Collaborator	• Patient care
• Manager	• System-based practice
• Health advocate	• Practice-based learning and improvement
• Scholar	• Professionalism
• Professionalism	

Abbreviations: CanMEDS, Canadian Medical Education Directives for Specialists; ACGME, Accreditation Council for Graduate Medical Education.

CanMEDS

1. Medical expert
2. Communicator
3. Collaborator
4. Leader
5. Health advocate
6. Scholar
7. Professional

- *Alkhayal et al. Advances in Medical Education and Practice 2012:3. 97-104.*
- *Holmboe et al. The Milestones Guidebook Version 2016. ACGME.*
- *Frank et al. CanMEDS 2015 Physician Competency Framework. Royal College of Physicians and Surgeons of Canada.*
- *https://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e*

Milestone Description: Template				
Level 1	Level 2	Level 3	Level 4	Level 5
What are the expectations for a beginning resident?	What are the milestones for a resident who has advanced over entry, but is performing at a lower level than expected at mid-residency?	What are the key developmental milestones mid-residency? What should they be able to do well in the realm of the specialty at this point?	What does a graduating resident look like? What additional knowledge, skills & attitudes have they obtained? Are they ready for certification?	Stretch Goals – Exceeds expectations
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				

As medical experts, internists are able to reach the milestones outlined in the following table by years 2 and 5 of training.

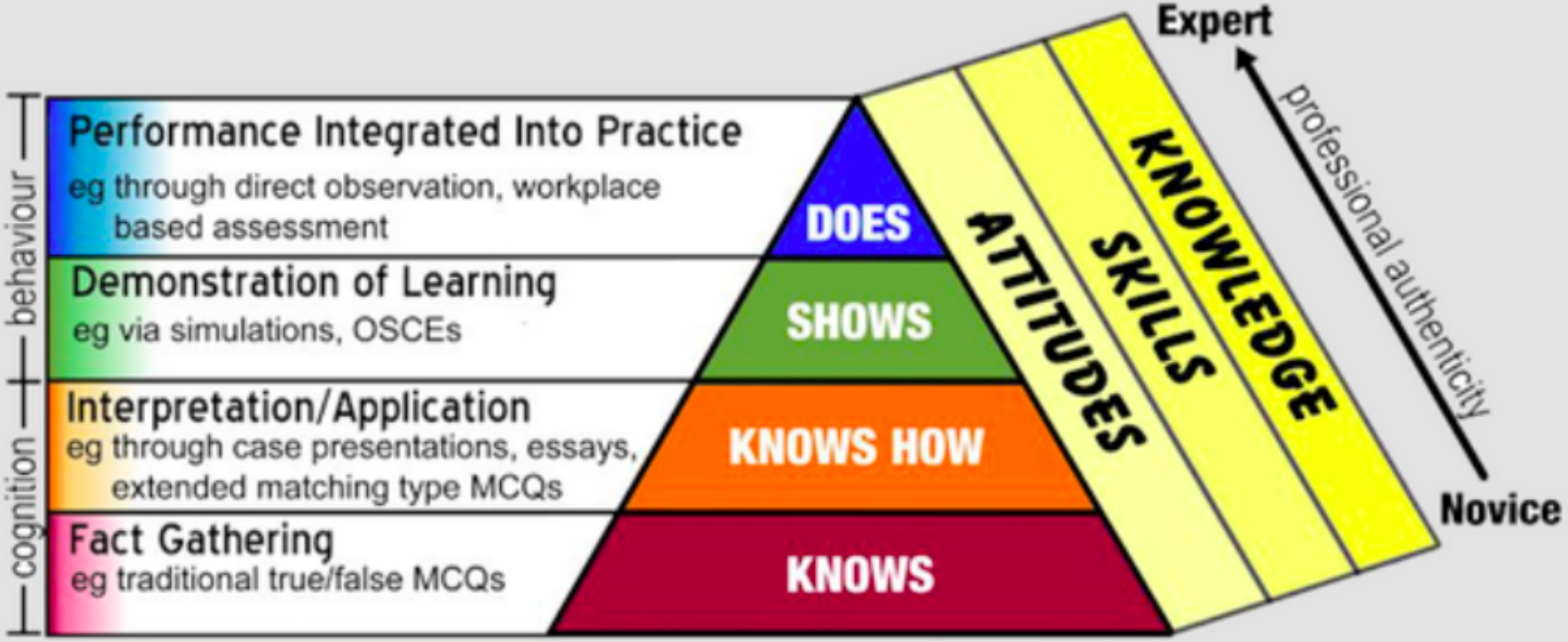
MILESTONES — YEAR 2	MILESTONES — YEAR 5
Obtain a relevant history from the patient in an efficient, compassionate and factual manner	Obtain relevant historical subtleties that inform and prioritise both differential diagnoses and diagnostic plans, including sensitive, complicated and detailed information that often may not be volunteered by the patient
Perform a physical examination that is appropriately targeted to the patient's symptoms. Identify pertinent abnormalities using recognised techniques	Routinely identify subtle or unusual physical findings that may influence clinical decision-making, using advanced techniques where applicable
	Demonstrate and teach how to obtain important physical findings for junior members of the healthcare team
Analyse all available data, including history, physical examination and preliminary laboratory data, to define a patient's presenting complaint	
Seek out and analyse appropriate, verified and prioritised data from secondary sources (e.g. family, records, pharmacy records); obtain a patient's consent	
Prioritise differential diagnoses and develop evidence-based diagnostic and therapeutic care plans for common inpatient and ambulatory conditions	
Accurately monitor important changes in the patient's physical condition through examination over time in outpatient and inpatient settings	
Modify differential diagnoses and care plans based on clinical course and data as appropriate	
Recognise when to seek additional guidance	
Reach agreement with patients and their families regarding priorities for each encounter at the outset	Focus the clinical encounter, performing it in a timely and effective manner, without excluding key elements

Example of EPA report

Area of practice	Rotation title			
Stage of training	Stage		Year 1	Version
The following EPA will be entrusted when your supervisor is confident that you can be trusted to perform the activity described to the required standard with the appropriate level of supervision or no supervision at all. Your supervisor will expect you to know when to ask for additional help; he or she will also trust you to seek assistance as appropriate and in a timely manner.				
Title	Producing discharge summaries and organising appropriate transfer of care			
Description	The trainee can produce succinct and informative discharge summaries and organise appropriate transfer of care. He or she understands the importance of clinical records in transfer of care and discharge and can make the appropriate arrangements for medications and/or other ongoing treatments and liaise with appropriate clinicians, teams, community, organisations and primary care providers. The trainee formulates relapse prevention and recovery plans in collaboration with the patient and provides appropriate and timely handover of written information. The discharge summaries are succinct yet informative and can function as a clinical handover, as well as a historical record of the patient's hospitalisation, treatment and progress, including key points for decision-making.			
Competencies	ME	Sub-competencies #	HA	Sub-competencies #
	COM	Sub-competencies # Sub-competencies #	SCH	Sub-competencies #
	COL	Sub-competencies #	PROF	Sub-competencies #
	LEAD	Sub-competencies #		
Knowledge, skills and attitude required	Competence is demonstrated if the trainee has shown sufficient aspects of the knowledge, skills and attitudes described below			
	Ability to apply an adequate knowledge base • Understands the importance of handover of information, especially during transition of clinical care • Understands the principles of relapse prevention and recovery • Demonstrates knowledge of risks associated with transfer of care, e.g. loss of information or lack of follow-up • Demonstrates knowledge of the range of follow-up and community services **Skills** • Uses effective and timely verbal and written communication, including electronic communication where appropriate • Grasps and formulates the essentials of the case and the treatment plan, including relapse prevention and risk-management plans • Communicates key points of decision-making • Communicates and collaborates effectively with patients and families/carers in organising transfer of care • Uses discretion where required and avoids pejorative language • Appropriately considers confidentiality issues and consent **Attitudes** • Uses appropriate means of communication (e.g. telephone) when required • Exhibits a patient-centred approach to care • Demonstrates willingness to include all appropriate stakeholders in the transfer of care • Demonstrates respect for patients, other members of the multidisciplinary team, and patient advocates and their views			
Assessment method	Continuous assessment during individual and clinical supervision			
Suggested assessment method details	Case-based discussions; multisource feedback			

MILLER'S PRISM OF CLINICAL COMPETENCE (aka Miller's Pyramid)

it is only in the "does" triangle that the doctor truly performs

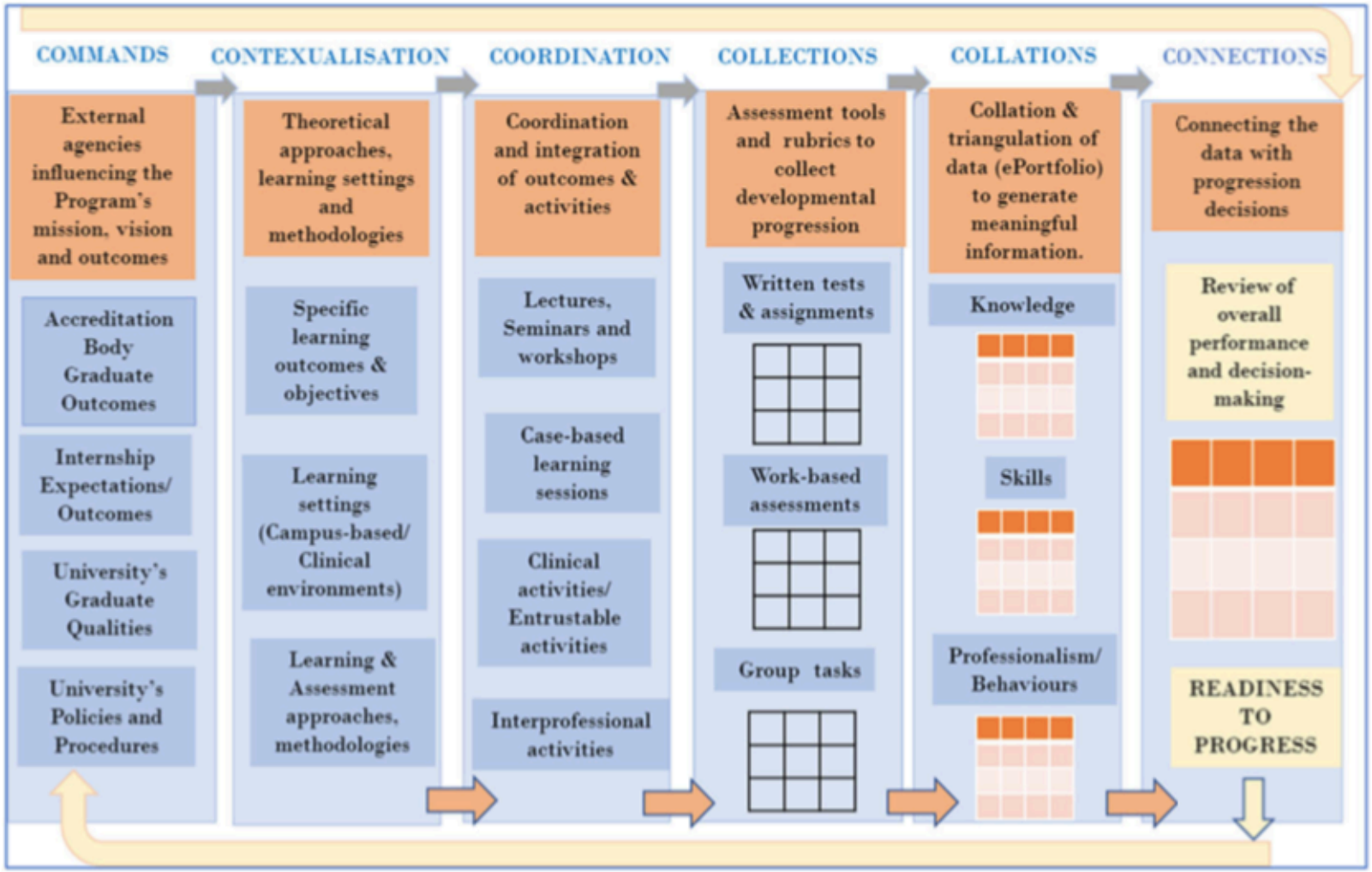


Based on work by Miller GE. The Assessment of Clinical Skills/Competence/Performance; Acad. Med. 1990; 65(9): 63-67
Adapted by Drs. R. Mehay & R. Burns, UK (Jan 2009)

3P-6Cs System Thinking Toolkits

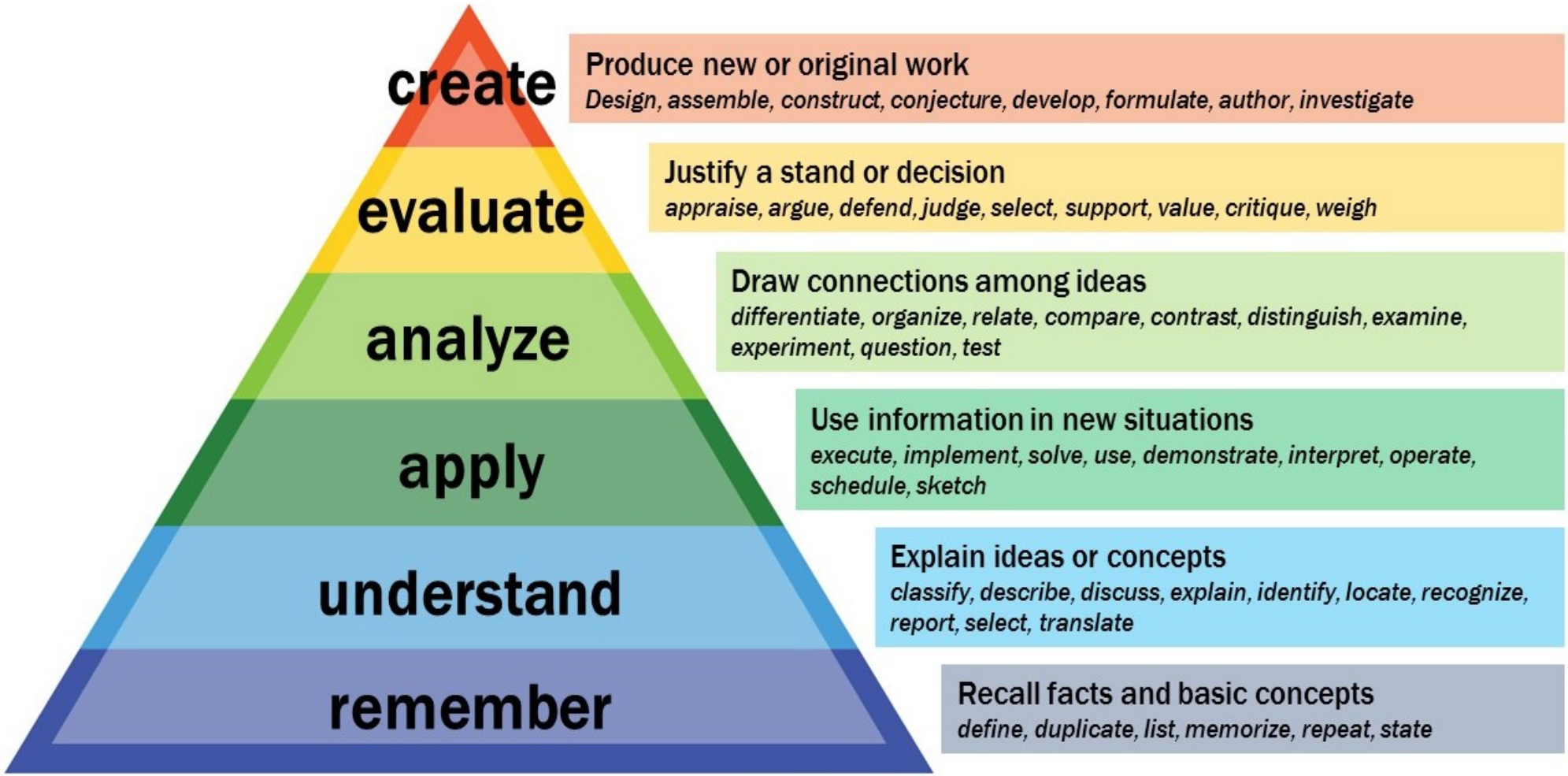
Khanna et al. BMC Medical Education (2021) 21:20

Application of 6Cs to create a coherent and integrated curricular design



Khanna et al. BMC Medical Education (2021) 21:20

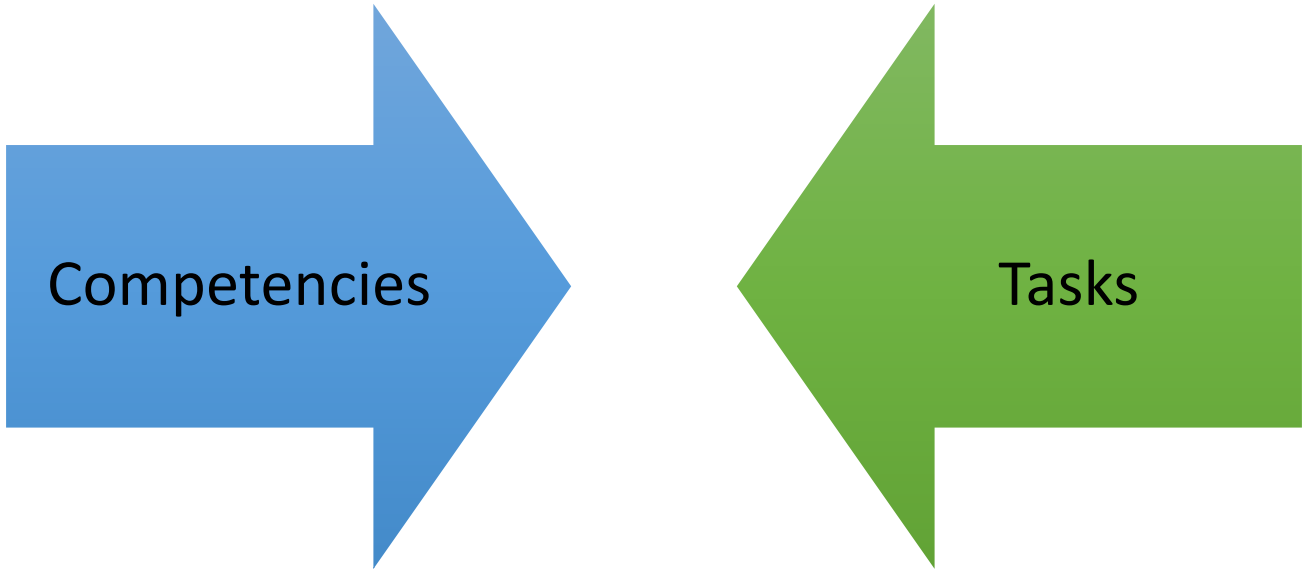
Bloom's Taxonomy



https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

EPA

- Entrustable Professional Activity (EPA) as Effective Clinical Assessment



Ref: Olle Ten Cate, EPA

REVIEW ARTICLE

A primer on entrustable professional activities

Olle ten Cate

Center for Research and Development of Education, University Medical Center Utrecht, Utrecht, The Netherlands

KJME

Entrustable professional activities (EPAs) have become a popular topic within competency-based medical education programs in many countries and hundreds of publications within only a few years. This paper was written to introduce the ins and outs of EPAs. After a brief hist
is explained. Next, ent
presented. For readers
The paper concludes w

Key Words: Clinical

Entrustment as Assessment: Recognizing the Ability, the Right, and the Duty to Act

Olle ten Cate, PhD

The Challenge

Competency- and milestone-based frameworks are des
to improve assessment of learners on broad domains. s

From case-based to entrustment-based discussions

Olle ten Cate[1] and Reinier G Hoff[2]

[1]Centre for Research and Development of Education, University Medical Centre Utrecht, the Netherlands

t, the Netherlands

nd now we are honoured to introduce
ncept 10 years ago. In health profes-
etencies and now we are beginning to
f assessment in relation to the actual
at make up what health professionals
rs can be trusted to carry out clinical
eed to be able to trust their learners,
sks may be assessed. This is a valuable

competencies often only
n their relevance in a
ific clinical context.[3] The
to bridge this gap between

MEDICAL TEACHER
2021, VOL. 43, NO. 10, 1106–1114
https://doi.org/10.1080/0142159X.2020.1838465

MEDICAL TEACHER

Taylor & Francis
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AMEE GUIDE

OPEN ACCESS Check for updates

The recommended description of an entrustable professional activity: AMEE Guide No. 140

Olle ten Cate[a] and David R. Taylor[b]

[a]Center for Research and Development of Education, University Medical Center Utrecht, Utrecht, The Netherlands; [b]Department of Medicine, Queen's University, Kingston, Canada

MEDICAL TEACHER, 2018
https://doi.org/10.1080/0142159X.2018.1435856

MEDICAL TEACHER

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OPEN ACCESS Check for updates

The EPA-based Utrecht undergraduate clinical curriculum: Development and implementation

Olle ten Cate[a], Lysanne Graafmans[a,b], Indra Posthumus[a,c], Lisanne Welink[d] and Marijke van Dijk[e]

[a]Center for Research and Development of Education, University Medical Center, Utrecht, The Netherlands; [b]Department of Medical Education, Education Center, University Medical Center, Utrecht, The Netherlands; [c]Department of Dermatology, Bravis Hospital, Bergen op Zoom, The Netherlands; [d]Department of General Practice, Julius Center for Health Sciences and Primary Care, University Medical Center, Utrecht, The Netherlands; [e]Department of Pathology, University Medical Center, Utrecht, The Netherlands

Med.Sci.Educ. (2016) 26 (Suppl 1):S5–S7
DOI 10.1007/s40670-016-0342-8

CrossMark

KEY NOTE LECTURE

Entrustment Decision-Making in Competency-Based Teaching and Assessment in Health Professions Education

Olle ten Cate[1]

EPA Patient Care – Traditional Medicine

- Perform Hypothesis Driven Question
- Perform Hypothesis Driven Physical Exam
- Provide a Concise Summary of Statement
- Formulate Data Driven Diagnosis Analysis
- Red Flags Identification and Management, including Concept Application in Collaborative Care and Patient Centered Care
- Develop Treatment Strategies and Goals based on Diagnosis Analysis; including awareness in Prognosis
- Perform Acupuncture and its Adjunct Modalities based on Diagnosis Analysis and Treatment Strategies
- Prescribe Herbs and its Modification based on Diagnosis Analysis and Treatment Strategies
- Educate Dietary, Exercises and Lifestyle Modalities based on Diagnosis Analysis and Treatment Strategies
- Recommendation on Suitable Supportive Diagnostic Exam for further Assessment based on Current Differential Diagnosis

EPA Professional Practice – Traditional Medicine

- Demonstrate Effective Communication
- Provide Professional Attitude and Effective Time Management
- Exercise Evidence Based Medicine and Evidence Based Informed Practice

Competencies ?

- Medical Knowledge:
  - Passed Acupuncturist Licensing Exam
- Patient Care:
  - Passed Communication, Clinical Skill and Case Management Exam
- System-based Practice:
  - Clinic staff report of minimum patient safety event
  - High patient satisfactory rate in care management, transition and resources
  - Advocates improvement for the professions
- Professionalism and Development:
  - Somewhat egoistic, but responsible in duties with great lapses prevention management
  - Uses up-to-date knowledge and has feedback seeking behavior
- Communication, Collaborator, Leadership:
  - High patient and family satisfactory rate in consultation
  - Colleagues and staffs report adequate collaboration
  - Clear, concise, timely manner and well-organized patient documentation

Struggle in Residency

- Since 2001, residencies have struggled with teaching and assessing Systems-Based Practice (SBP)
- The competency alone is not sufficient to support assessment
- Systems Thinking as the Missing Foundational Construct underlying SBP

Colbert CY et al. Teaching and Learning in Medicine, 23(2), 179–185

System Thinking ~ Dating back to ‘50s

- Reductionist VS Whole
- The ability to analyze systems as a whole, including the recognition of essential interrelationships within the system and between subsystems, and any changes and patterns that arise out of the networks of relationships and interactions
  - From Multiple Perspective

- Werhane PH. Moral imagination and systems thinking. Journal of Business Ethics 2002;38:33–42
- Aronson D. Intro to ST. Introduction to systems thinking. Available at: http://www.thinking.net/Systems Thinking/Intro to ST/intro to st.html. Accessed July 31, 2008.
- Montuori LA. Organizational longevity. Integrating systems thinking, learn- ing, and conceptual complexity. Journal of Organizational Change Man- agement 2000;13:61–73.

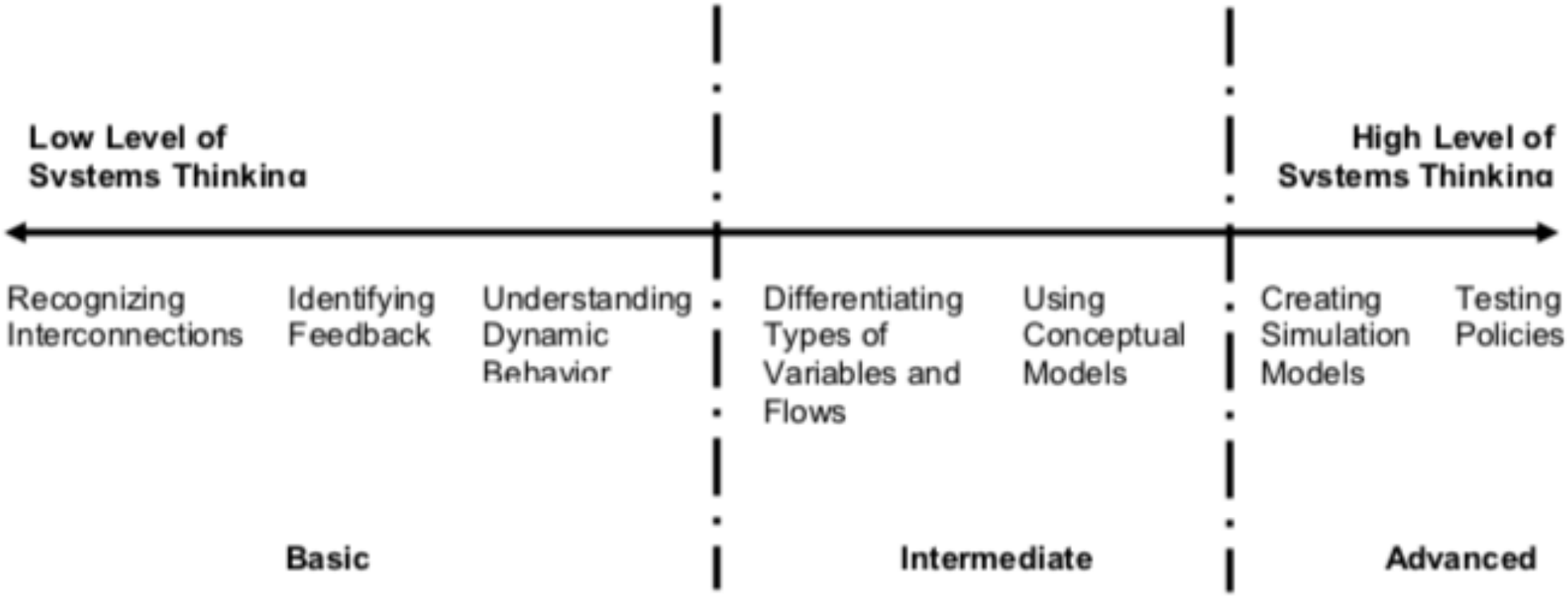
Systemic and Dynamic Way of Thinking

- Power of the systems paradigm to improve the way people operate in the world

- From Operating Tools → Changes the Way of Thinking

Stave K et al. What Constitutes Systems Thinking? A Proposed Taxonomy

System Thinking Continuum



Stave K et al. What Constitutes Systems Thinking? A Proposed Taxonomy

Complex systems approach for sports injuries: moving from risk factor identification to injury pattern recognition—narrative review and new concept

N F N Bittencourt,[1] W H Meeuwisse,[2] L D Mendonça,[3] A Nettel-Aguirre,[4] J M Ocarino,[5] S T Fonseca[5]

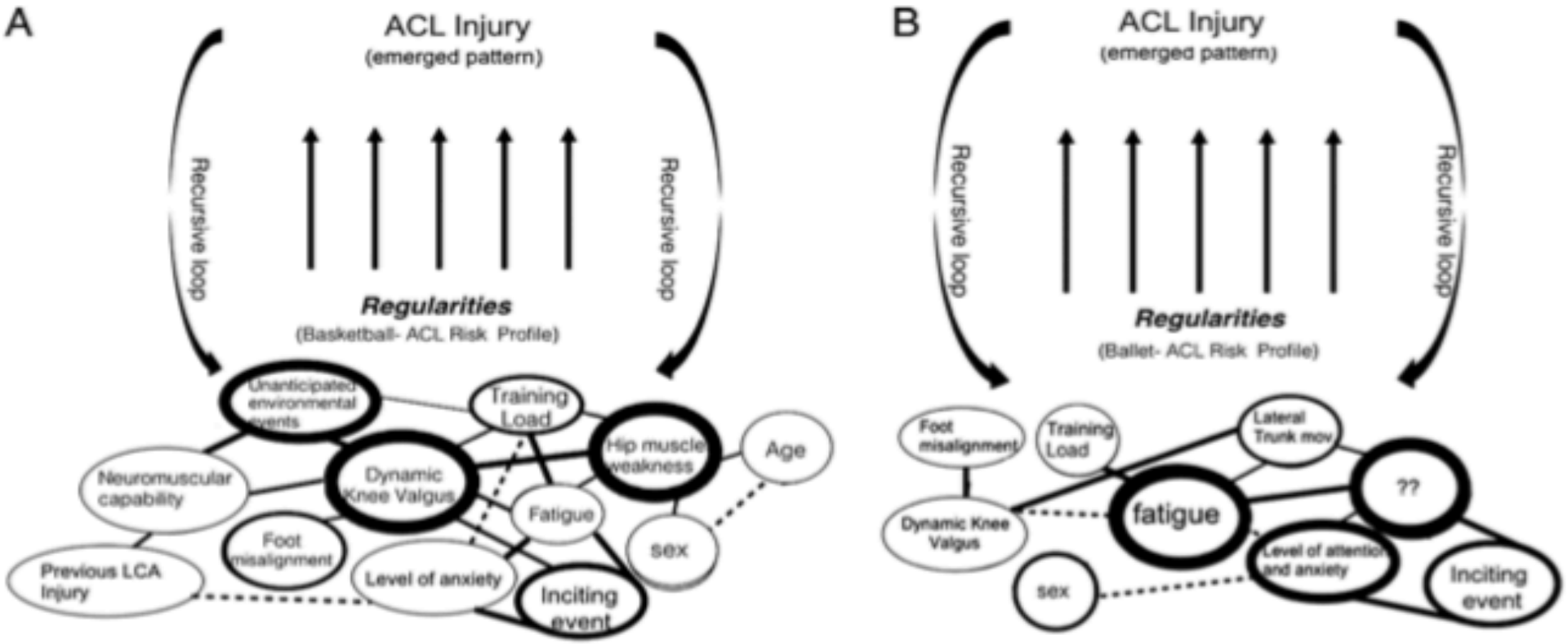
ABSTRACT

Injury prediction is one of the most challenging issues in sports and a key component for injury prevention. Sports injuries aetiology investigations have assumed a reductionist view in which a phenomenon has been simplified into units and analysed as the sum of its basic parts and causality has been seen in a linear and unidirectional way. This reductionist approach relies on correlation and regression analyses and, despite the vast effort to predict sports injuries, it has been limited in its ability to successfully identify predictive factors. The majority of human health conditions are complex. In this sense, the multifactorial complex nature of sports injuries arises not from the linear interaction between isolated and predictive factors, but from the complex interaction among a web of determinants. Thus, the aim of this conceptual paper was to propose a complex system

complex. In this sense, we need a broader approach to better understand the complex relationships between risk factors/predictors and injuries.[2–4 6–8]

To address this issue, Meeuwisse *et al*[9] developed a dynamic, recursive model for risk and causes of sports injuries, considering that the injury has a non-linear behavior. This model brought many advances to the understanding of sports injuries aetiology, because it assumes that there may be recurrent changes in susceptibility to injury along the participation in sports, and the primary risk factors exposure can produce adaptations and continuously change the risk. Despite the recognition of the non-linear and recursive characteristics of sports injuries, the model described by Meeuwisse *et al*[9] was not sufficient to address the complex interactions among several factors.

Web of determinants for an ACL injury in basketball athletes (A) and ballet dancers (B)



Bittencourt NFN, et al. Br J Sports Med 2016;50:1309–1314. doi:10.1136/bjsports-2015-095850

Example ~ Potential System Thinking Objectives

Residents must be able to demonstrate the following systems thinking skills:

- Describe the clinical microsystems in which they work and train, including the mission, functions, stakeholders, and interrelationships;
- Identify critical interfaces within the system where communication and information exchange is essential to maintain optimal system functions;
- Analyze a system problem from multiple perspectives;
- Develop alternative, test-able hypotheses for system improvements;
- Test potential system solutions with targeted interventions in short PDSA cycles (expert level).

Colbert CY et al. Teaching and Learning in Medicine, 23(2), 179–185

Diagnosis Complexity in Traditional Medicine

- Zheng → Syndrome or Pattern → Basic Unit and Key Concept
- Abstraction of a major disharmonious pathogenesis, which is identified from a comprehensive analysis of clinical information from 4 main diagnostic TM methods (Observation, listening, questioning, and pulse analyses)

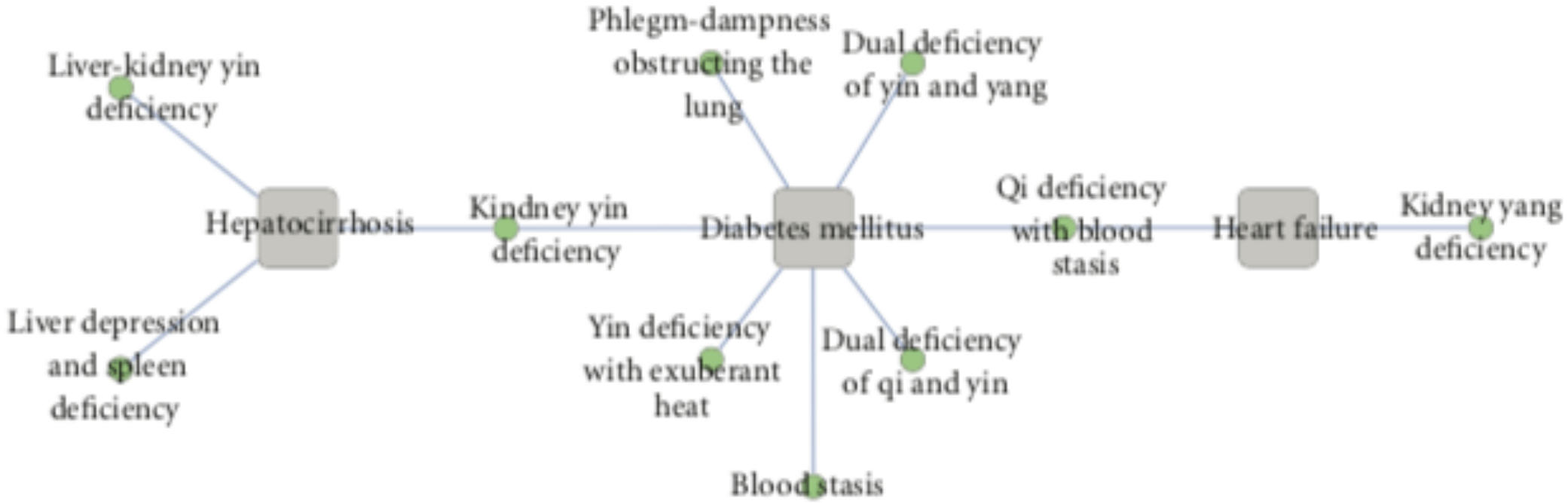
A. Lu et al. Journal of Ethnopharmacology, vol. 141, no. 2, pp. 549–556, 2012.

Top 20 most frequent Disease-Zheng in published studies

No.	Disease	Zheng	Frequency
1	Diabetes mellitus	Dual deficiency of qi and yin	783
2	Diabetes mellitus	Dual deficiency of yin and yang	247
3	Diabetes mellitus	Blood stasis	237
4	Diabetes mellitus	Phlegm- dampness obstructing the lung	184
5	Diabetes mellitus	Kidney yin deficiency	150
6	Diabetes mellitus	Yin deficiency with exuberant heat	128
7	Diabetes mellitus	Qi deficiency with blood stasis	109
8	Gastritis	Liver qi invading the stomach	286
9	Gastritis	Spleen-stomach dampness-heat	250
10	Gastritis	Spleen-stomach deficiency cold	148
11	Gastritis	Stomach deficiency cold	148
12	Gastritis	Dampness-heat	132
13	Gastritis	Liver qi depression	106
14	Heart failure	Qi deficiency with blood stasis	133
15	Heart failure	Kidney yang deficiency	132
16	Hepatocirrhosis	Liver-kidney yin deficiency	126
17	Hepatocirrhosis	Kidney yin deficiency	126
18	Primary hypertension	Ascendant hyperactivity of liver yang	115
19	Primary hypertension	Yin deficiency with yang hyperactivity	115
20	Hepatocirrhosis	Liver depression and spleen deficiency	110

Miao Jiang et al. Evidence-Based Complementary and Alternative Medicine Volume 2012, Article ID 409568, 9 pages doi:10.1155/2012/409568

Overview of the disease-Zheng network



Miao Jiang et al. Evidence-Based Complementary and Alternative Medicine
Volume 2012, Article ID 409568, 9 pages doi:10.1155/2012/409568

System Thinking in Traditional Medicine

- Individualism of Pattern Recognition across problem representation
- Patient-centered Care model application

Methods of Learning in Traditional Medicine follows System Thinking

- Cultural Curriculum and Role Modeling in TM methods of learning
- Doors for Inter-professional collaboration
- Integrative care model of organization
- Leadership and Advocacy

Pharmaceutical Medicine (2019) 33:373–377
https://doi.org/10.1007/s40290-019-00295-y

CURRENT OPINION

ICD-11: Impact on Traditional Chinese Medicine and World Healthcare Systems

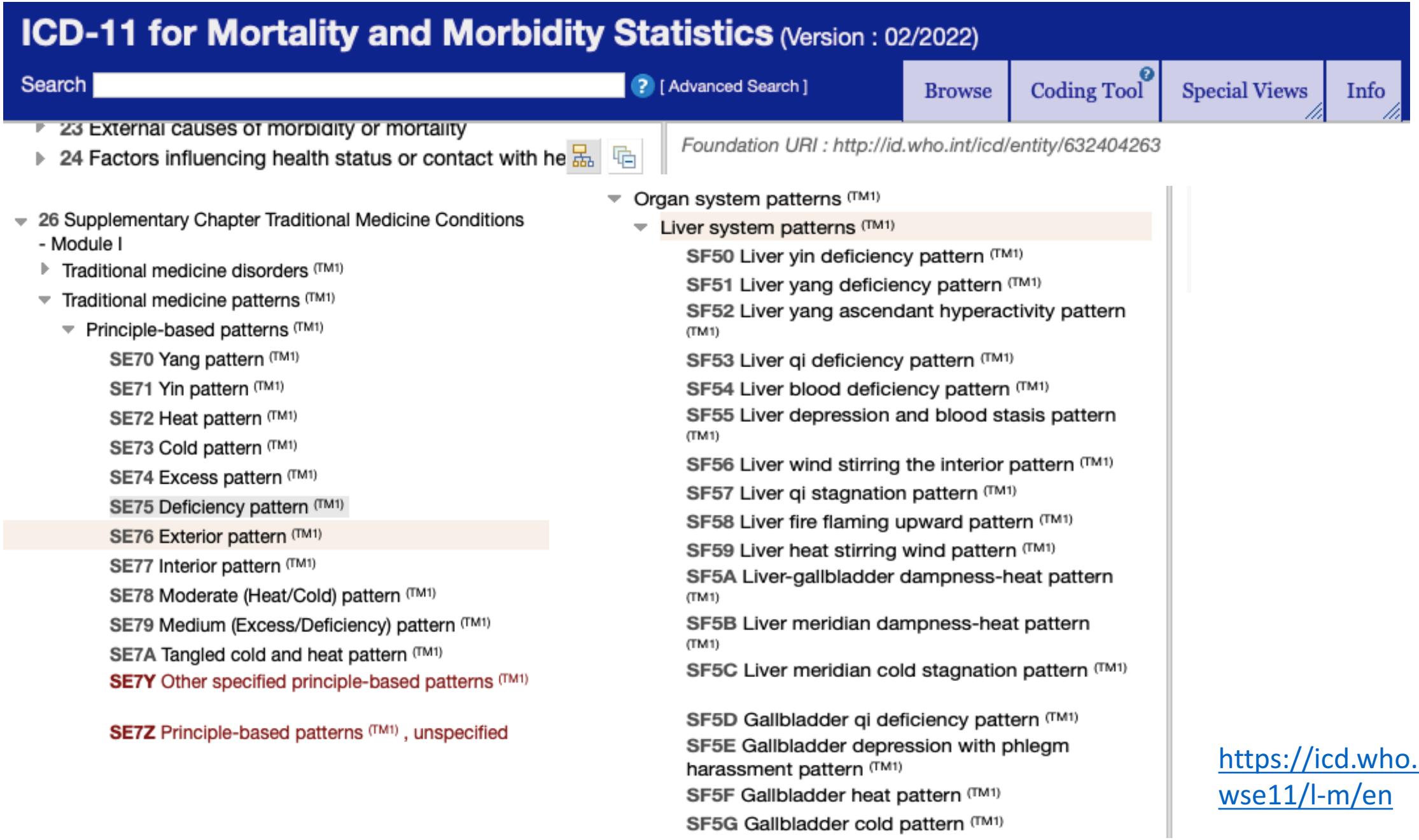
Wai Ching Lam[1] · Aiping Lyu[1] · Zhaoxiang Bian[1]

Key Points

Including traditional Chinese medicine (TCM) in the International Statistical Classification of Diseases and Related Health Problems (ICD) is a landmark for both TCM and ICD.

With this move, the World Health Organization (WHO) acknowledges the value of TCM, responds to member state needs, and advances the integration of TCM with Western medicine.

This initiative will stimulate further research, education, adoption, and recognition of TCM worldwide.



https://icd.who.int/browse11/l-m/en

Clinical Diagnostic Reasoning

- Clinical Diagnostic Reasoning is the critical and most important competence that clinicians need to acquire
- It drives the clinician's ability to diagnose and make decisions

Pelaccia T. Medical Education Online 2011, 16: 5890

- From initial approach to information gathering and testing, formulating a diagnosis to solve the problem and provide solution
- Knowledge application

Practitioner – Patient – System

- Clinical Diagnostic Reasoning → Knowledge, Skills, Consistency, Attitudes
- Evidence Based Medicine and Evidence Based Informed Practice
- Patient shared decision making

- Above all → Patient-centered care ~ Links ”Patient Care” with “System Based Practice”

Student's Aspect with Clinical Diagnostic Reasoning

- Underlying questions:
  - "What explains this patient's concerns?"
  - "What are the findings, problems and diagnoses?"

Case #1

- Patient's story:
  - My knee hurt me so much last night, I woke up from sleep. It was fine when I went to bed. Now it's swollen. It's the worst pain I've ever had. I've had problems like this before in the same knee, once 9 months ago and once 2 years ago. It doesn't bother me between times.

  - Case Presentation ?

Bowen J. NEJM. 2006. 355;21

Case #1 ~ Biomedicine

- **#1 Learner's Case Presentation to Instructor:**
  - My next patient is a 54-year-old white man with knee pain. It started last night. He does not report any trauma. On examination, his vital signs are normal. His knee is swollen, red, and tender to touch. It hurts him a lot when I test his range of motion. He's had this problem twice before.
  - **Instructor's inquiry:** What do you think is causing this patient's knee pain?
  - It could be an infection. It could be a new onset of rheumatoid arthritis. It could be Lyme disease. Since he doesn't recall falling, I doubt it's an injury. I don't know whether osteoarthritis ever presents like this, but he does have a history of knee pain.

Bowen J. NEJM. 2006. 355;21

Case #1 ~ Biomedicine

- **#2 Learner's Case Presentation to Instructor:**
  - My next patient is a 54-year-old white man with a sudden onset of pain in his right knee that awakened him from sleep. He does not report any trauma and was essentially asymptomatic when he went to bed. His history is remarkable for two episodes of similar, severe pain 9 months and 2 years ago. He is pain-free between episodes. He is afebrile today. His knee is swollen, tender to touch, and erythematous.

  - **Instructor's inquiry:** What do you think is causing this patient's knee pain?

  - The patient has acute gout. He has had multiple discrete episodes with abrupt onset of extremely severe pain involving a single joint with evidence of inflammation on examination. Before all his episodes, he is asymptomatic. I would have expected gout to affect the first metatarsophalangeal joint, but it can present in the knee. Nothing suggests any ongoing, chronic problem in the knee. I don't see any portal of entry to suggest acute infectious arthritis and he looks quite well for that. His other joints are normal on examination. I doubt that he has a flare-up of osteoarthritis with pseudogout or a systemic, inflammatory arthritis such as rheumatoid arthritis.

Bowen J. NEJM. 2006. 355;21

Case #2 ~ Traditional Medicine

- Patient's story:
  - I usually have trouble with breathing like it is hard for me to catch a breath. I easily feels dizzy lately. It's the worst feeling that I've ever had. I've had this same problem back when I'm still in school and on/off. For the last 2 years it has been troublesome. I had this checked up with my primary physician, the tests and chest imaging were normal and my physician concluded that it was due to the chronic asthma that I have had for years ever since when I'm young.

  - Case Presentation ?

Case #2 ~ Traditional Medicine

- **#1 Learner's Case Presentation to Instructor:**
  - I have a patient, 45 years old, male, with shortness of breath. He also had dizzy. He had this problem with breathing for 2 years. He mentioned he had this since he's young when he's still in school. His energy level is weak. His primary physician diagnosed him with chronic asthma. His tongue looks pale and pulse is deep and weak.

- **Instructor's inquiry:** What do you think is causing this patient's breathing problem ? What is his diagnosis pattern of disharmony?

  - It could be Lung qi deficiency. It is a breathing problem and energy level is weak and pulse is weak. I'm not sure what other patterns, maybe Spleen, since Spleen produces qi and blood.

Case #2 ~ Traditional Medicine

- **#2 Learner's Case Presentation to Instructor:**
  - I have a patient, 45 years old, male, with shortness of breath. Problem with breathing noticed mostly trouble during inhalation. It is a chronic problem since childhood, exacerbated since 2 years ago. Diagnosed as chronic asthma from his primary physician. He does not have cough, no shivering or feeling of cold, no fever, no runny nose, no palpitation or chest pain, no tinnitus, no urinary related symptoms or signs, no problem with stools (constipation or loose stools), no complaint with abdomen like pain or distension, appetite is good. He easily feels dizzy particularly since 2 years ago too. He easily feels tired, spontaneous sweat mostly on forehead, neck, palms and feet. On exertion (after running), triggers severe sweating, dizziness and shortness of breath. Physical exam founds pale complexion, pale lip, wheezing on bilateral chest, soreness of lumbar region that is better with acupressure or massage. His tongue looks pale and tender, dry coating and pulse is deep and weak.
- **Instructor's inquiry :** What do you think is causing this patient's breathing problem ? What is his diagnosis pattern of disharmony?
  - It is Kidney fails to receive Qi. Several features fit to the Kidney features: chronic childhood problem, difficulty in inhaling, soreness of lumbar region. Features that fit with the deficiency condition: dizziness, exertion worsens the condition, spontaneous sweat, soreness is better with pressure or massage. Pale tongue, weak pulse. It does not fit to Lung qi deficiency since no cough and a lot of themes of Kidney pattern related. It is also not solely Kidney qi deficiency since it involves asthma as major complaint and no urination related complaint. Spleen qi deficiency is not solely fit since appetite is good and no complain on abdomen and stools. Heart qi deficiency also not fit since no palpitation or related complaint like chest pain.

Clinical Diagnostic Reasoning in Traditional Medicine

- The clinical reasoning in Traditional Medicine is heavily knowledge dependent
- ICD-11 code for TM patterns brings the door to the lens in TM competencies
- Diagnostic Reasoning is the critical competencies that defines the TM professions, beyond the modalities

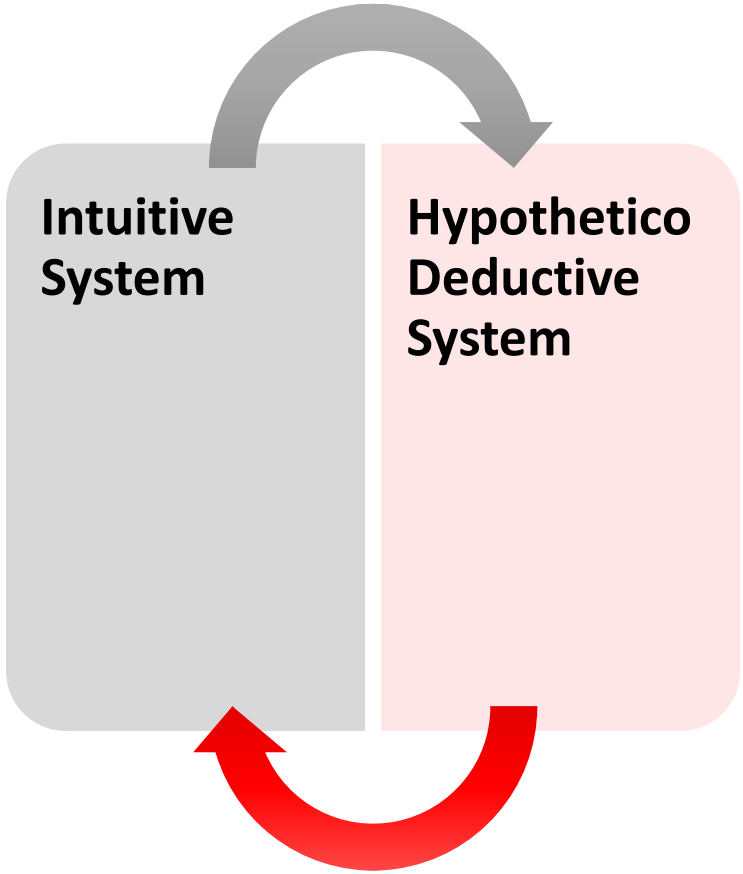
Focus Question

- Unravelling the obstacle in building clinical diagnostic reasoning competencies
- What are the structure component of thinking / guideline step in clinical diagnostic reasoning ?

2 Different System of Thinking in Diagnostic Reasoning

Dual Processing Theory

~ when clinician establishes diagnosis



Bates Chp 5, 13th Edition, 2021

Schaye V et al. Medical Teacher, 2019, vol 41, no 10, pp 1192-1199.

Intuitive System VS Hypothetico-deductive System

Intuitive Thinking

- It evolves as the brain learns more patterns
- Does not need to be taught

Hypothetico Deductive System

- Must be developed by the learners designed to support specific thinking skills
- Can solve and explain cases characterized by issues that never encountered before

Jeremy R et al. Teaching Clinical Reasoning and Critical Thinking: From Cognitive Theory to Practical Application. Chest. 2020.

Hypothetico Deductive System

- Best represented by inductive reasoning
- The creation of hypotheses rooted in understanding of foundational principles or concepts

Jeremy R et al. Teaching Clinical Reasoning and Critical Thinking: From Cognitive Theory to Practical Application. Chest. 2020.

Intuitive Thinking

- **Experienced** clinicians usually **spend little effort and quickly** formulate their thinking and arrive with the diagnosis

Pinnock R et al. Identifying developmental features in students' clinical reasoning to inform teaching. Medical Teacher. 2019. vol 41, no 3, pp 297-302.

- Heuristics → Subconscious reflexes that influence conclusions
- Heuristics contribute to many errors associated with intuitive thinking
- Most people are not aware they are engaging in heuristics (cognitive biases most of time)

Jeremy R et al. Teaching Clinical Reasoning and Critical Thinking: From Cognitive Theory to Practical Application. Chest. 2020.

Pattern Recognition Development Process

- According to this “structural paradigm,” medical knowledge is organized and stored in memory as mental representations of diseases
- Such representations are organized in categories, each containing a collection of medical information such as symptoms, signs, etc
- Repeated experience facilitates exposure to similar patients and eventually consolidates the storing of contextual information in memory under the corresponding category

Charlin B, Boshuizen HP, Custers EJ, Feltovich PJ. Scripts and clinical reasoning. Med Educ. 2007;41(12):1178-1184.

Pattern Recognition Development Process

- When the physician thus encounters a new patient, certain clinical features are recognized
- These features act as cues in the sense that they activate memory-recall of the corresponding category containing certain or all of these features

Charlin B, Boshuizen HP, Custers EJ, Feltovich PJ. Scripts and clinical reasoning. Med Educ. 2007;41(12):1178-1184.

Pattern Recognition Development Process

- Generating a diagnostic hypothesis becomes an act of categorization
- A diagnosis is not reached by deliberately forming and testing workable hypotheses as in the hypothetico-deductive model but instead recognized intuitively
- This phenomenon is widely known as pattern recognition or non-analytic reasoning

Norman G, Brooks L. The non- analytical basis of clinical reasoning. Theory Pract. 1997;2(2):173-184.

Eva KW. What every teacher needs to know about clinical reasoning. Med Educ. 2005;39(1):98-106.

Clinical Faculty VS Practitioner ?

- Differs in fundamental way
- Clinical teachers must diagnose both the patient's clinical problem and the learner’s ability and skill

Bowen J. NEJM. 2006. 355;21

- How to properly assess the outcome of student’s in clinical training that they actually achieved the competency ?
  - Workplace-based educational intervention can promote transfer of clinical reasoning skills to the clinical context

Schaye V et al. Medical Teacher, 2019, vol 41, no 10, pp 1192-1199.

Clinical Teaching Techniques

- Instructor must help learners develop analytical reasoning skills and habits of life-long self-directed learning → Fostering clinical reasoning and critical thinking
- Prioritizing questions that begin with ‘why’ or ‘how’
- Memorization and recall of material have been prioritized but not clinical reasoning

Jeremy R et al. Teaching Clinical Reasoning and Critical Thinking: From Cognitive Theory to Practical Application. Chest. 2020.

One-minute Preceptor

Microskills of Clinical Teaching	Learner Performance	Instructor's Action
Step 1: Get a commitment	Early in discussion with instructor, learner commit to diagnosis, workup and plan	What do you think is going on? What would you like to accomplish with this patient?
Step 2: Probe for supporting evidence	Learner reflect on how they arrived at that decision ~ Identify what know / not know	Where are the pertinent positives that led to your diagnosis? What else did you consider in evaluating this patient?
Step 3: Teach general rules	Gaps in knowledge / understanding can be addressed at this stage	Teach to specifically identified deficits in learner's knowledge, reasoning by providing "general rules"
Step 4: Reinforce was done right	What went well during the encounter and/or their evaluation of patient?	Commit to 1 specific behaviors that learner able to repeat consciously and intentionally
Step 5: Correct mistakes	What could have gone better during the encounter and/or their evaluation of patient?	Constructive feedback, esp when learners are unable independently identify errors with their reasoning

Jeremy R et al. Teaching Clinical Reasoning and Critical Thinking: From Cognitive Theory to Practical Application. Chest. 2020.

Pre-requisites for learning clinical reasoning

- Preparing students to act in clinical rotations and become involved in clinical reasoning and decision-making in practice is done in medical schools in very different ways

- Traditionally, medical schools require students to participate in introductory courses designed to teach clinical skills, such as communicating with patients, medical interview, physical exam, and clinical reasoning

- Most common approach involves a longitudinal series of small groups using problem-based learning methods and simulated clinical cases

Judith Bowen and Olle ten Cate in “Pre-requisites for learning clinical reasoning” Ch.4

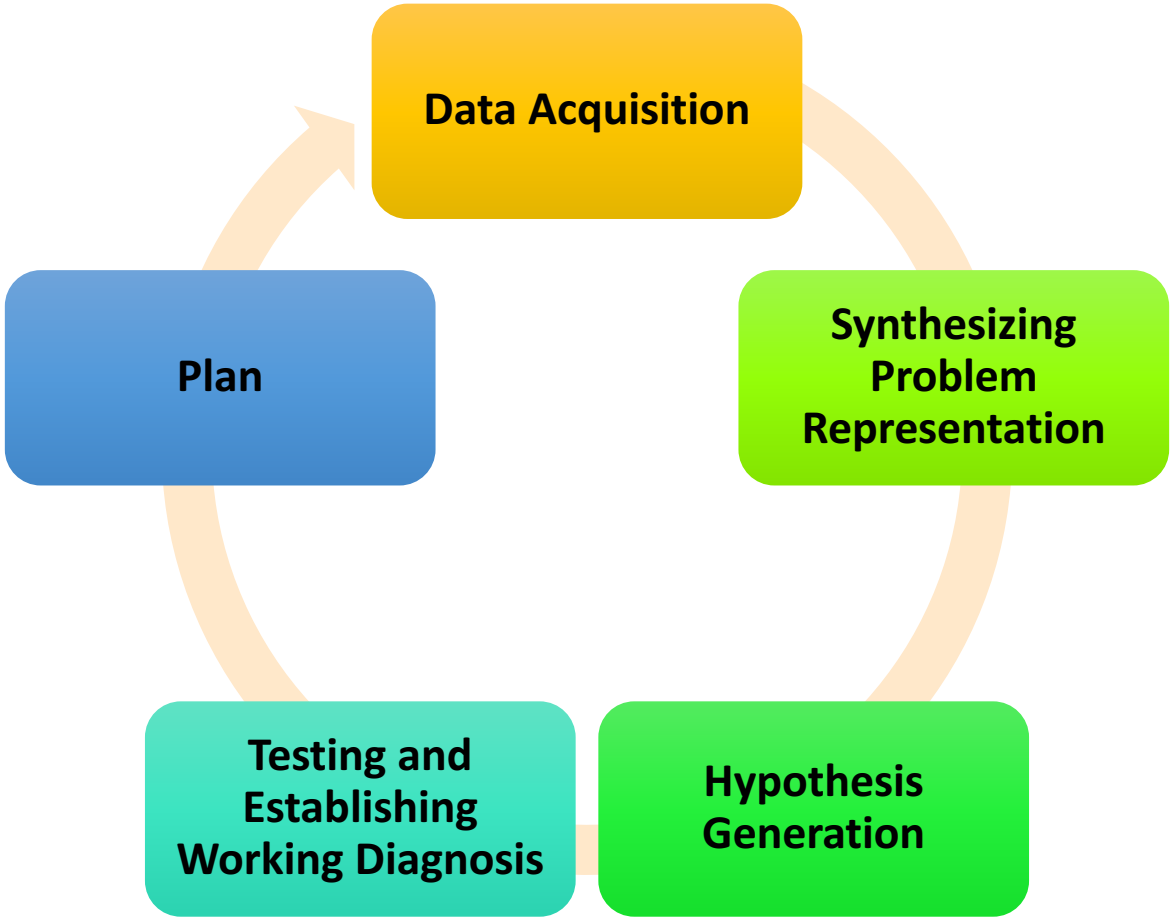
Pre-requisites for learning clinical reasoning

- To be able to adequately contribute to the reasoning process --- Students must be prepared with:
  - Clinical vocabulary
  - Ability to create clinical problem representation
  - Foundational illness script mental library
  - Habits of contrastive learning
  - Hypothesis-driven inquiry
  - Diagnostic verification

Judith Bowen and Olle ten Cate in “Pre-requisites for learning clinical reasoning” Ch.4

Guideline for Learners and Instructor

Structure and Process: Clinical Diagnostic Reasoning



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STEP #1: Data Acquisition

Identify Patient Information	Source of Reliability	Chief Complaint	HPI
Past Medical History	Family History	Personal and Social History	ROS

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STEP #2: Synthesizing Problem Representation

~ Organizing and Interpreting Clinical Information

- Understanding component in Pattern of Disharmony ?
  - Nature of disharmony
    - Relationship of the vital substances with pathogenic factors
  - Location of disharmony
    - Where this relationship takes place
  - State development of disharmony
    - Current progress of this relationship

STEP #2: Synthesizing Problem Representation

- '**Problem Representation**' is a synthesis and distillation of the salient information which "**makes a case**" for the working diagnosis and is written in the patient's medical record as a "**Summary Statement**"

- Problem Representation → **Summary Statement**

STEP #2: Synthesizing Problem Representation

- A well-developed summary statement contains important qualifying adjectives to represent the richness of its patient's case that correlate to illness script and sound for diagnosis
- This qualifying adjectives are known as **"Semantic Qualifiers"**

- **Semantic qualifiers are qualitative terms that are binary in nature (opposing descriptors) that can be used to compare and contrast diagnostic considerations**

- Example: Hot vs Cold, Acute vs Chronic, Mild vs Severe, Diffuse vs Localized, Unilateral vs Bilateral, etc

STEP #2: Synthesizing Problem Representation

- A 62 years old male with palpitation and dream disturbed sleep presenting with **cold in body and hands, pale lips and nails, pale tongue, thready and weak pulse.**
  - This summary of statement sounds a diagnosis pattern of Heart Blood Deficiency'

- Note:
  - It presents the chief complaint component, important data presentation from subjective and objective using semantic qualifiers to fit with the illness script of Heart Blood Deficiency that has underlying etiology of Spleen failure to produce blood, chronic condition impairing the blood, and the key features that it affects the Heart organ and leading to pathophysiology of Heart Blood fails to nourish the Heart. It is short and sound for diagnosis. It demonstrates clinical reasoning and gives meaning of your analysis to the case

STEP #2: Synthesizing Problem Representation

- A 62 years old male with palpitation and dream disturbed sleep presenting with **vexing heat in chest and palms, red cheeks, red tongue with scanty coat, thready and rapid pulse.**
  - This summary of statement sounds a diagnosis pattern of Heart Yin Deficiency

- Note:
  - It presents the chief complaint component, important data presentation from subjective and objective using semantic qualifiers to fit with the illness script of Heart Yin Deficiency that has underlying etiology of excessive consumption of yin fluids at the late stage of warm disease and the key features that it affects the Heart organ and leading to pathophysiology Deficiency of Heart Yin generates internal deficient heat, then leading to the internal disturbances. It is short and sound for diagnosis. It demonstrates clinical reasoning and gives meaning of your analysis to the case.

Semantic Qualifiers

- The deep meaning of a symptom or sign [attribute] is never totally understood alone, but is understood in relation to its semantic position within a set of symptoms and signs [attributes]

Bordage G, Lemieux M. Semantic structures and diagnostic thinking of experts and novices. Acad Med. 1991;66(9) Suppl:S70-S72.

Table 4.1 Translation of a patient's history using semantic qualifiers (A)

Structured inquiry of reason for visit	Patient's story described using lay terms	Abstract translation using semantic qualifiers
Symptom onset	"At first the stiffness didn't bother"	Gradual, progressive
Symptom site/location	"Stiffness of her hands"	Small joints, symmetrical
Symptom severity	"Stiffness on awakening lasting 1–2 h," "difficulty using micro-pipettes"	Moderate to severe morning stiffness
Symptom course/ chronology	"2 months"	Chronic
Context/patient characteristics	"55-year-old," "Alicia"	Middle-aged female

Judith Bowen and Olle ten Cate in "Pre-requisites for learning clinical reasoning" Ch.4 (Olle ten Cate "*Principles and Practice of Case-based Clinical Reasoning Education*, Innovation and Change in Professional Education, 2018"

Knowledge Encapsulation

- Novice learners in the pre-clinical years develop semantic networks, containing, mainly, causal links between “causes and consequences of diseases in terms of general pathophysiological/biological processes.”

- Later on, in their clinical years, when students encounter actual patients, these causal representations become encapsulated under clinical diagnostic labels.

- Extensive clinical practice allows these networks to gradually expand and refine, forming eventually illness scripts.

Charilaos Koufidis et al. Unravelling the polyphony in clinical reasoning research in medical education. J Eval Clin Pract. 2021;27:438–450.

STEP #2: Synthesizing Problem Representation

~ Synthesizing Clinical Information and Developing Problem Representation

- Summary Statement is formed once all the clinical information has been gathered and organized

- Without the capability to organize the clinical information then the summary statement is likely to be uncoordinated and do not guide the clinician in forming a hypothesis and differential diagnosis

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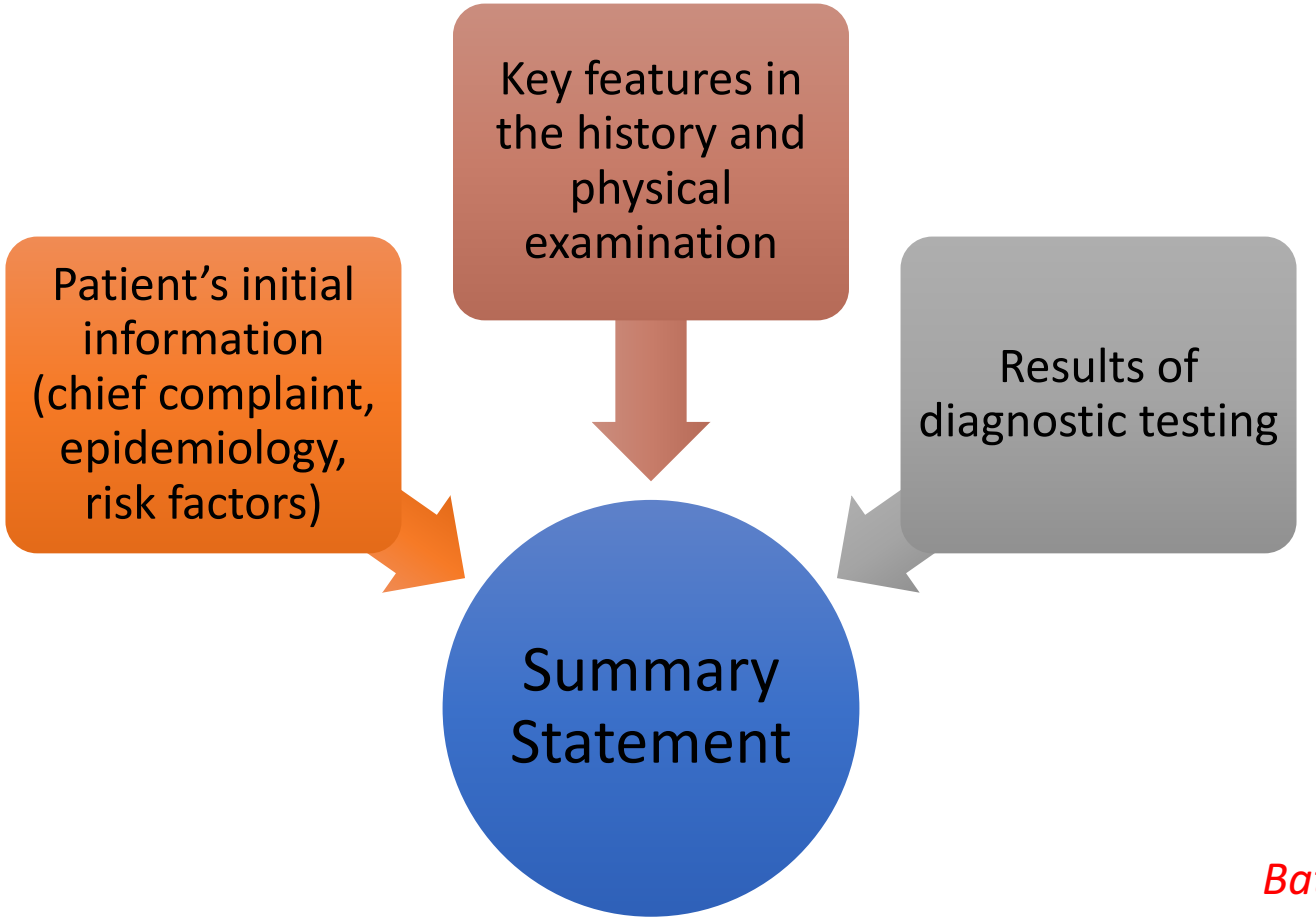
STEP #2: Synthesizing Problem Representation

~ Synthesizing Clinical Information and Developing Problem Representation



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STEP #2: Synthesizing Problem Representation

~ Synthesizing Clinical Information and Developing Problem Representation

- Example Part 1:
  - A 33 years old female came to the office with chief complaints of on and off bloated sensation over her stomach for the last 2 months.

- From this information, the first process in synthesizing the information is to form the initial information for the problem representation:
  - A 33 years old female with chronic abdominal bloatedness.

Chen Jia-xu. Chinese Medicine Study Guide: Diagnostics. People's Medical Publishing House. 2007.

STEP #2: Synthesizing Problem Representation

~ Synthesizing Clinical Information and Developing Problem Representation

- Example Part 2:
  - The bloated sensation primarily over the diaphragm of both sides, particularly worst after lunch or dinner. Patient typically rubs her stomach and stand-up or does a small walk after the meal for about 10 minutes to reduce the bloatedness on the stomach. Together with the bloated stomach, she also sometimes has stiffness at the back of the neck, headache from the back of the head sometimes goes over the top of her head. Usually sleeping eliminates the headache. She also felt that her stomach was kind of feeling big and concerned about gaining weight. Her bowel movement pattern was not good as she mentioned she usually has constipation and not having regular everyday bowel movement. The patient, easily irritated, has been dealt with a lot of stress over the last 5 months.

- As we have gathered more information, her health history present several important clinical findings to support the problem representation:
  - A 33 years old female with chronic abdominal bloatedness, hypochondriac distention that is increased after meals and relieved by movement, irregular bowel movements, irritability, stress.

Chen Jia-xu. Chinese Medicine Study Guide: Diagnostics. People's Medical Publishing House. 2007.

STEP #2: Synthesizing Problem Representation

~ Synthesizing Clinical Information and Developing Problem Representation

- Example Part 3:
  - Her tongue presents with bilateral purplish body, teethmarks, thin white tongue coating with slightly dry on the bilateral sides. Her pulse is wiry, tight over the 3 positions of both wrists, slightly slippery felt on the left wrist on 2nd position and slightly deep on the 3rd position of both wrists. Palpation on abdomen felt tense and uncomfortable particularly on both sides of diaphragms and Stomach meridian line from ST25 - 27 area.

- The result of the problem representation with the notable findings from the examinations:
  - A 33 years old female with chronic abdominal bloatedness, hypochondriac distention that is increased after meals and relieved by movement, irregular bowel movements, irritability, stress. Tongue: Body color with bilateral slightly pale and teethmarks, thin white tongue coating with some area begins to dry or irregular fluid distribution. Pulse: wiry, tight, slightly slippery on Spleen position and deep on bilateral Kidneys position. Palpation on the abdomen increased the uncomfortness.

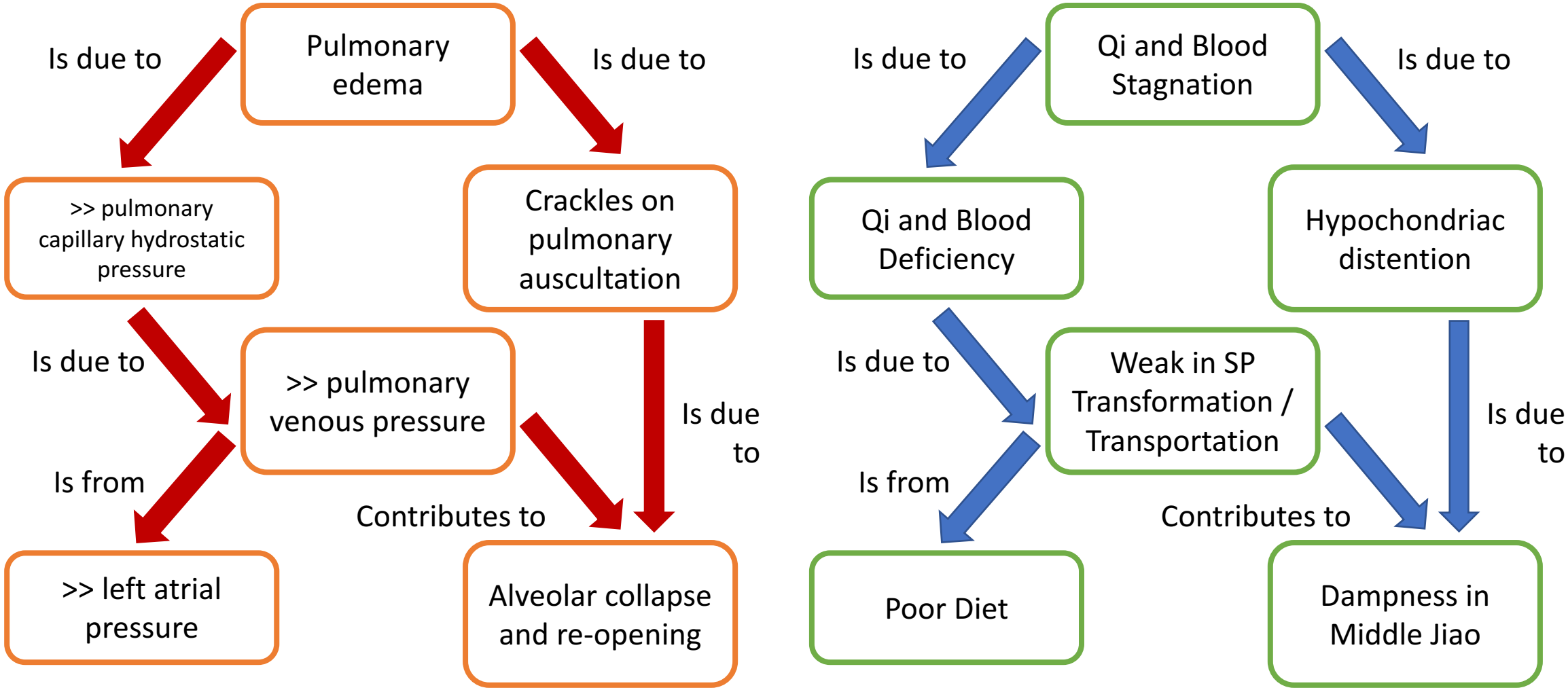
Chen Jia-xu. Chinese Medicine Study Guide: Diagnostics. People's Medical Publishing House. 2007.

STEP #3: Hypothesis Generation

- Derived from the key purpose to search for the probable cause of the findings
- **Applies "Pathophysiology"** in patient's signs and symptoms to decide if a hypothesis is based upon a sound scientific basis
- Pathophysiology uses the medical knowledge either in Traditional Medicine or Biomedicine, including basic science concepts
- Tests, evidence based medicine ~ useful value in analysis
- By consulting the clinical literature, the clinician will pursue a life-long goal of evidence-based decision making and clinical practice

https://medicine.uiowa.edu/internalmedicine/education/master-clinician-program/students/clinical-and-diagnostic-reasoning

Classic Concept in which clinical findings and pathophysiological concepts are linked with “connecting words”



Adapted from Jeremy R et al. Chest. 2020.

STEP #3: Hypothesis Generation

~ Select the most specific and critical findings to support your hypothesis

- Begin listing all the probable diagnosis or differential diagnosis of "Pattern of Disharmonies"

- Defining Features
- Discriminating Features

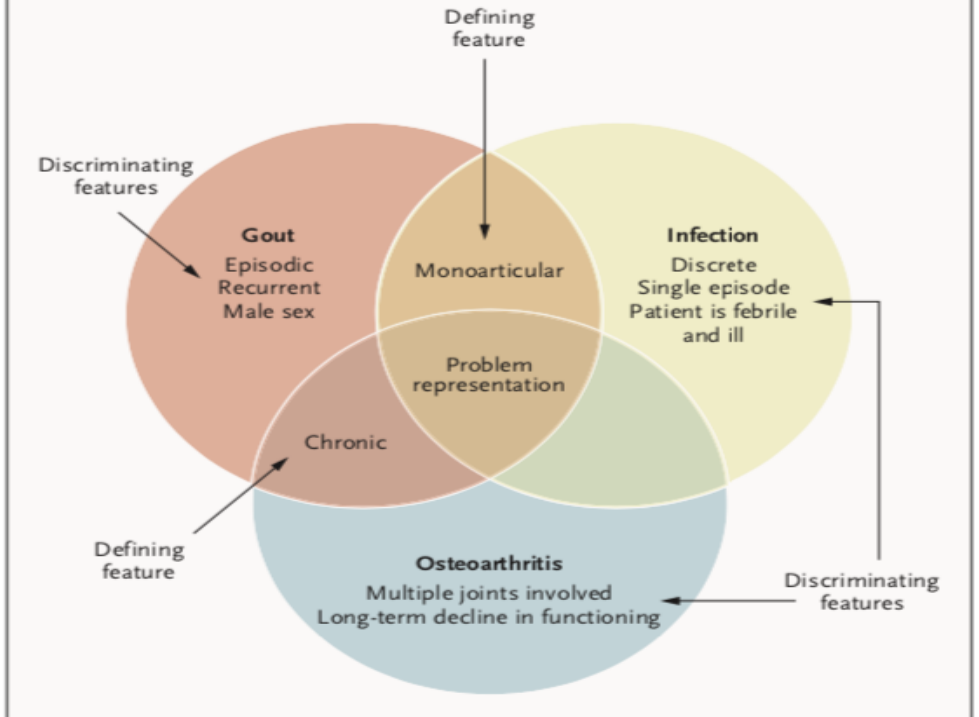


Figure 3. Defining and Discriminating Features of a Set of Diagnostic Hypotheses for Acute Arthritis.

The problem representation is "acute onset of a recurrent, painful, monoarticular process in an otherwise healthy middle-aged man." Defining features are descriptors that are characteristic of the diagnoses (e.g., gout, septic arthritis, osteoarthritis). Discriminating features are descriptors that are useful for distinguishing the diagnoses from one another.

Bowen J. NEJM. 2006. 355;21

STEP #3: Hypothesis Generation

~ Select the most specific and critical findings to support your hypothesis

- For example:
  - A 33 years old female with chronic abdominal bloatedness, hypochondriac distention that is increased after meals and relieved by movement, irregular bowel movements, irritability, stress.
    - Tongue: Body color with bilateral slightly pale and teethmarks, thin white tongue coating with some area begins to dry or irregular fluid distribution.
    - Pulse: wiry, tight, slightly slippery on Spleen position and deep on bilateral Kidneys position. Palpation on the abdomen increased the uncomfortness.

STEP #3: Hypothesis Generation

~ Select the most specific and critical findings to support your hypothesis

- For example:
  - A 33 years old female with chronic abdominal bloatedness, hypochondriac distention that is increased after meals and relieved by movement, irregular bowel movements, irritability, stress.
    - Tongue: Body color with bilateral slightly pale and teethmarks, thin white tongue coating with some area begins to dry or irregular fluid distribution.
    - Pulse: wiry, tight, slightly slippery on Spleen position and deep on bilateral Kidneys position. Palpation on the abdomen increased the uncomfortness.

- Differential Diagnosis → Liver Qi Stagnation
  - Defining features: irritability, chronic onset, wiry pulse, tongue pathological reference for liver on the bilateral regions
  - Discriminating features: hypochondriac distention, movement relieves the pain, tongue body color on the reflected region of liver is pale, irregular bowel movements, constipation, headache

STEP #3: Hypothesis Generation

~ Select the most specific and critical findings to support your hypothesis

- For example:
  - A 33 years old female with chronic abdominal bloatedness, hypochondriac distention that is increased after meals and relieved by movement, irregular bowel movements, irritability, stress.
    - Tongue: Body color with bilateral slightly pale and teethmarks, thin white tongue coating with some area begins to dry or irregular fluid distribution.
    - Pulse: wiry, tight, slightly slippery on Spleen position and deep on bilateral Kidneys position. Palpation on the abdomen increased the uncomfortness.

- Differential Diagnosis → Liver Blood Stasis
  - Defining features: irritability, chronic onset, wiry pulse, tongue pathological reference for liver on the bilateral regions
  - Discriminating features: sharp and stabbing characteristic of pain on hypochondriac region particularly, masses, movement does not reduce the pain, tongue body color is purplish on the liver region

STEP #3: Hypothesis Generation

~ Select the most specific and critical findings to support your hypothesis

- For example:
  - A 33 years old female with chronic abdominal bloatedness, hypochondriac distention that is increased after meals and relieved by movement, irregular bowel movements, irritability, stress.
    - Tongue: Body color with bilateral slightly pale and teethmarks, thin white tongue coating with some area begins to dry or irregular fluid distribution.
    - Pulse: wiry, tight, slightly slippery on Spleen position and deep on bilateral Kidneys position. Palpation on the abdomen increased the uncomfortness.

- Differential Diagnosis → Liver Yang rising
  - Defining features: irritability, chronic onset, wiry pulse, tongue pathological reference for liver on the bilateral regions
  - Discriminating features: headache rushing to head, red eyes, empty heat, increased blood pressure, rapid pulse, tongue body will be red especially bilateral (Liver region)

Contrastive Learning

- Contrastive learning “involves prompting the learner to explicitly search for similarities and differences between problems”

Medical Education, 41(3), 281–287.

- Students do not learn to appreciate how an abnormal finding would appear or what it might mean
- 4 interviewing behaviors were associated with high diagnostic accuracy:
  - Thorough exploration of the patient’s chief complaint early in the clinical encounter
  - Asking questions in close proximity (illustrative of a line of reasoning about a diagnostic hypothesis)
  - Asking patients to provide further clarifying information
  - Summarizing information gathered during the interview

Academic Medicine, 76(10 Suppl), S14–S17.

STEP #3: Hypothesis Generation

~ Match findings against all causative conditions (Illness Script)

- The clinical characteristics of each pattern of disharmony trigger a memory response to the clinicians or students from the previously learned information
- This clinical characteristic is known as **“Illness script”**
- The information listed in the illness script represents the characteristics of one pattern of disharmony

STEP #3: Hypothesis Generation

~ Match findings against all causative conditions (Illness Script)

- An illness script typically consists of the pattern's pathophysiology, epidemiology, time course, salient symptoms and signs, diagnostics and treatment.

- For example:
  - Illness script of Liver Qi Stagnation
  - Epidemiology / Pathophysiology: adult age, stressor environment
  - Time course: chronic onset
  - Clinical presentation: hypochondriac distention, movement relieves pain, no temperature quality is affected (hot or cold), irritability, easily involves digestive system including constipation / irregular bowel movements, tongue body color typically is pale on the bilateral sides, normal coating, wiry pulse
  - Diagnostic studies: Blood pressure typically still normal
  - Treatment: Smooth and regulate Liver Qi movement

Illness Script

- Illness scripts contain simplified causal explanations “packaged” under higher-level clinical concepts accommodating a wealth of clinically relevant features about a particular disease (symptoms, signs, etc.)

- Expertise thus evolves from a successive re-structuring of memory organization by illness scripts maturation

Charilaos Koufidis et al. Unravelling the polyphony in clinical reasoning research in medical education. J Eval Clin Pract. 2021;27:438–450.

STEP #3: Hypothesis Generation

~ Match findings against all causative conditions (Illness Script)

- The richness of the stored illness script as in the number, details, etc were all kept progressing as the students advanced in their clinical training

- The learning process of illness script simply began when a student encountered a case and pattern of disharmony and started picturing to understand the patient's case
  - For example:
    - A chronic dysmenorrhea patient with Liver Blood Stasis pattern
    - What are the critical symptoms and signs of this pattern ? How old is the patient ? When did these symptoms start ? What triggers the events ? What are the findings from the tongue and pulse ? And so on.

STEP #3: Hypothesis Generation

~ Eliminate Diagnostic Possibilities that fail to explain findings

- Eliminate any diagnosis from the list that fails to explain the findings and are considered not likely fit as the causes of the findings and suitable patterns of disharmonies

    - “Liver Yang Rising” on the patient due to clinical presentation of vertex headache, neck tension, chronic onset however this pattern is eliminated since the patient’s problem representation fails to explain condition that has normal blood pressure, no temperature related signs and symptoms (rapid pulse, red tongue body, afternoon fever, red eyes, etc), abdominal bloated and hypochondriac distention.

STEP #3: Hypothesis Generation

~ Weigh competing possibilities and select the most likely diagnosis

- It is important to pay attention to the matching between a patient's problem representation and a typical case of a given condition

    - Clinician may think of a low back pain due to pattern related to Kidney deficiency in someone who is 70 years old versus with a low back pain due to pattern of Qi and Blood Stasis on the Urinary Bladder sinew channels in someone who is 32 years old.

STEP #3: Early Learner VS Experts

- Early Learner:
  - Generate multiple broad categorical hypotheses based on general data gathering

- Experts:
  - Recognition of key features produces a narrower range initial intuitive hypotheses

Script Triggering

- Activation or “script triggering” occurs intuitively
- When 2 or more scripts are simultaneously triggered then the process becomes conscious and analytic.
- The activated scripts constitute plausible hypotheses and necessitate an active search for the presence or absence of further attributes (disease features) contained in these scripts in support of one or the other.
- Finally, the script that better matches these features is selected.
- Script processing is a deliberate process and shares similarities with the hypothetico-deductive model.

Charilaos Koufidis et al. Unravelling the polyphony in clinical reasoning research in medical education. J Eval Clin Pract. 2021;27:438–450.

STEP #3: Pay Attention to Life-threatening Condition

- Think of the worst possible scenario
- Never miss ruling out red flags signs and symptoms

- Identify the overall severity of the case:
  - Emergency vs Urgency

- Identify the red flag signs that prompt for case referral
  - Transition of care
  - Collaborative care
  - Consultation

STEP #4: Testing and Establish Working Diagnosis

- A hypothesis has been made
- Ready to test the hypothesis
- Likely elicits further intake, exams, etc
- Establish a working definition of the problem at the highest level of explicitness and certainty that the data allow

Diagnostic Verification

- The process in which one or more hypotheses are accepted as sufficiently valid to permit further decision making

Kassirer J et al. 2010. Learning clinical reasoning (2nd ed). Lippincott Williams and Wilkins.

- All actions that lead to confirmation of the correctness, to the extent possible, of the final diagnosis

Judith Bowen and Olle ten Cate in "Pre-requisites for learning clinical reasoning" Ch.4 (Olle ten Cate "*Principles and Practice of Case-based Clinical Reasoning Education*, Innovation and Change in Professional Education, 2018"

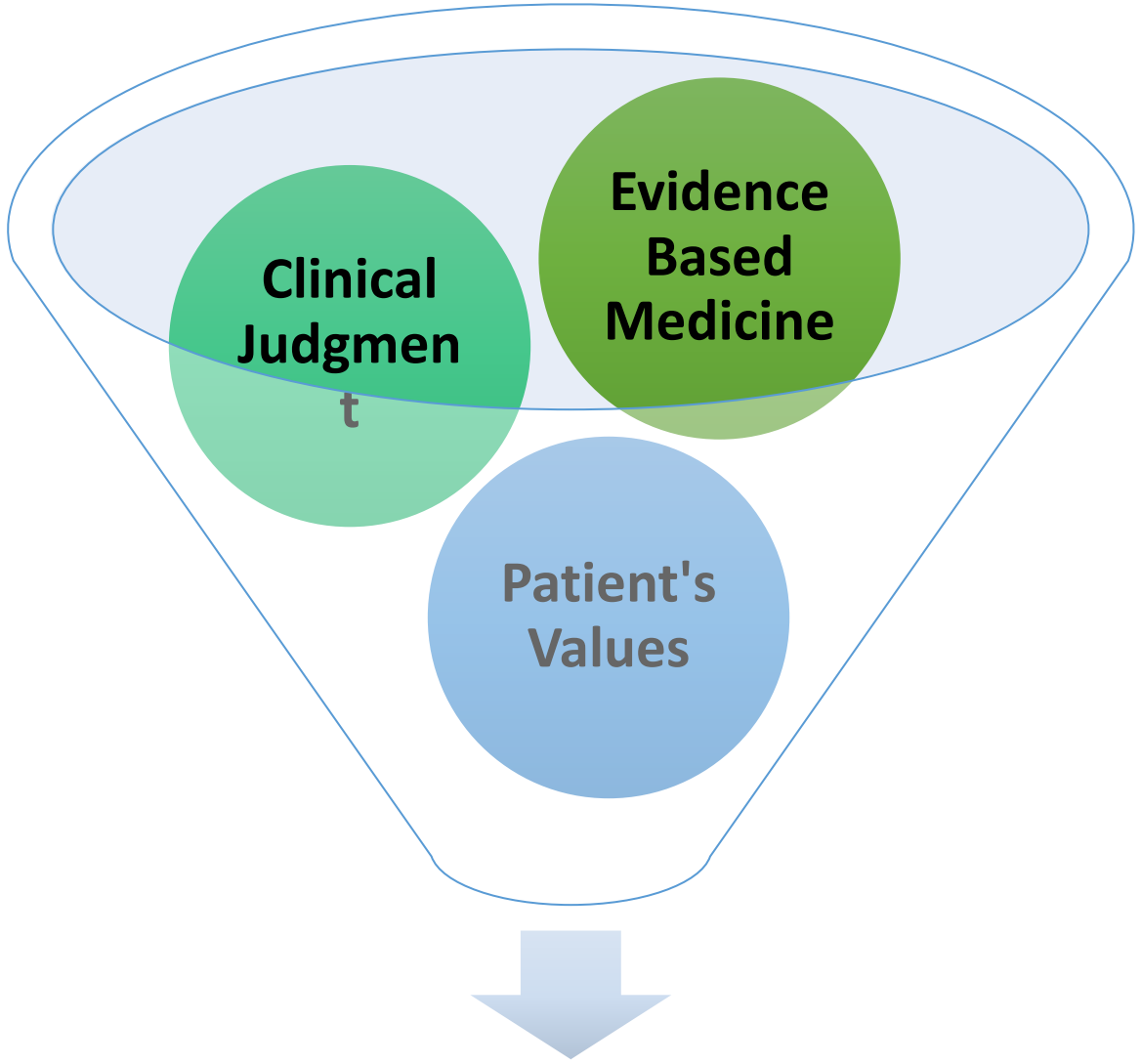
STEP #4: Testing and Establish Working Diagnosis

- Challenge for Learners:
  - Difficult to sort and group the gathered data from the subjective and objective findings
  - Difficult to give meaningful interpretation of the gathered data that leads to major problem
  - Difficult to sound the working diagnosis
  - Summary statement become large, not efficient, lack of direction to the sound diagnosis

- Challenge for Clinical Instructors:
  - Difficult to explain the process of landing to the summary of statement
  - Difficult to explain the purpose of including one content to another within the summary statement and correlate this into the subjective and objective findings
  - Difficult to differentiate clearly of a good and deficient summary statement and encounter problem with better reasoning and guiding the learner

STEP #5: Plan

- Planning the diagnostic and treatment strategy mainly in coherent with the identified working diagnosis
- Every step or decision made in diagnostic and treatment strategies should have reasoning based on the result of the working diagnosis
- Patient Shared Decision Making
- Evidence Based Informed Practice
- There is NO single right plan



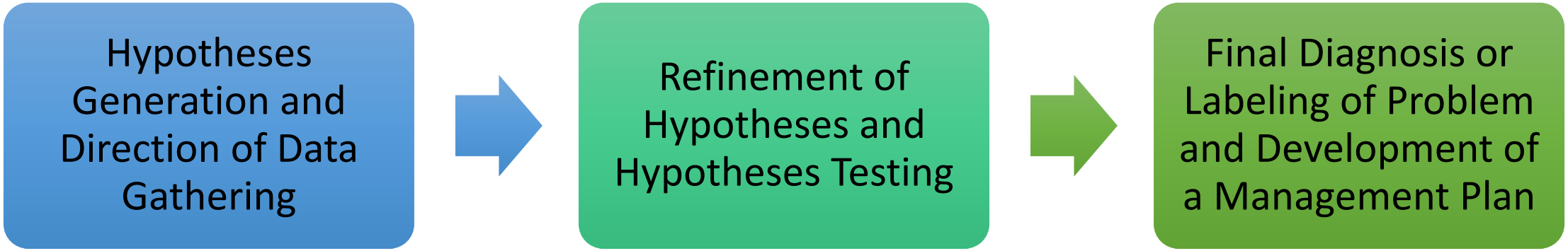
Treatment

Barry MJ et al. NEJM. 2012; 366(9):780-781.

Assessment and Plan

- Includes:
  - Summary of statement
  - Problem list
  - Diagnostic assessment with supporting evidence for the likelihood of each item in the differential diagnosis
  - Diagnostic Plan, Therapeutic Plan
    - Diagnostic plan that provides rationale for evaluating each item in the differential diagnosis
    - This section also can be presented as a therapeutic assessment that provides the clinical status of a known diagnosis moving forward.

Principal Clinical Reasoning Steps and Their Difficulties

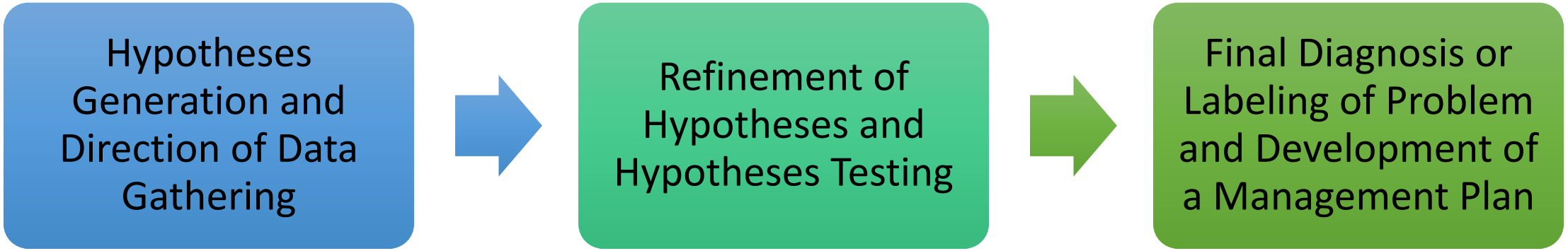


Learner's difficulties:

- Fail to detect appropriately key features or clues that allows generating diagnosis hypotheses
- Fail to produce a certain number of diagnosis hypotheses to guide his/her reasoning
- Fails to direct and focus data gathering

Marie-Claude Audetat et al. Clinical Reasoning Difficulties: A taxonomy for clinical teachers. Medical Teacher. 2013; 35; e984-e989.

Principal Clinical Reasoning Steps and Their Difficulties

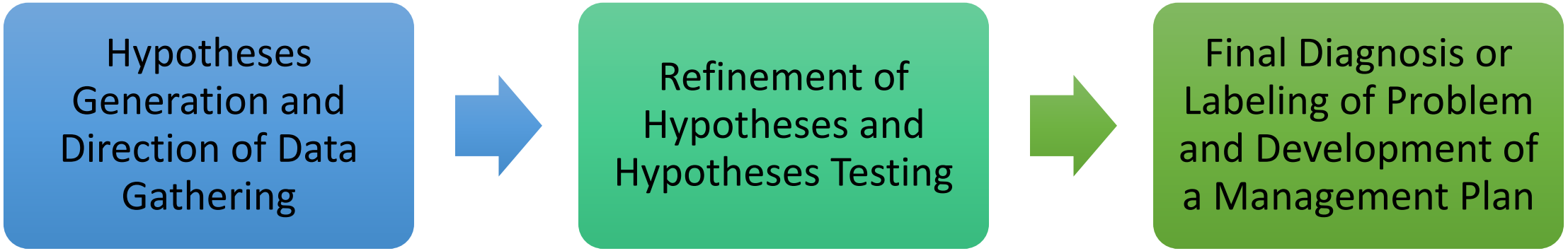


Learner's difficulties:

- Quickly focus on a single diagnostic hypothesis and conducts interview superficially (Premature Closing)
- When there are many complaints, difficult to focus interview on the most important aspects (Difficulties in prioritizing)

Marie-Claude Audetat et al. Clinical Reasoning Difficulties: A taxonomy for clinical teachers. Medical Teacher. 2013; 35; e984-e989.

Principal Clinical Reasoning Steps and Their Difficulties



Learner's difficulties:

- Fails to make connections between different pieces of information (paint overall clinical situation picture)
- Unsatisfactory synthesizing the whole reasoning process leads to inadequate management plan (elaborate a management plan)

Marie-Claude Audetat et al. Clinical Reasoning Difficulties: A taxonomy for clinical teachers. Medical Teacher. 2013; 35; e984-e989.

Cognitive Errors

- The reduction of diagnostic error is an important goal to reduce the morbidity, potential preventability and increased safety.
- A critical subset of diagnostic errors arises through cognitive errors, particularly those associated with failures in perception, failed heuristics and biases, and referred as Cognitive Dispositions to Responds (CDRs).

Croskerry P. Acad Med, vol 78, no 8, Aug 2003. pg 775-780.

Several Example Cognitive Errors

- Anchoring bias
  - Tendency to perceptually lock onto salient features in the patient's initial presentation too early in the diagnostic process, and failing to adjust this initial impression in the light of later information.
  - Clinician "locks onto" a patient's description of an aura that precedes her headaches and indicative of a migraine and fails to recognize red flags of increased intracranial pressure that should prompt neuroimaging study

- Availability heuristic
  - The disposition to judge things as being more likely, or frequently occurring, if they readily come to mind.
  - Clinician seen several times of patient with depression and anxiety diagnosed with Liver Qi stagnation pattern, fails or does not consider other patterns such as Heart and Kidney disharmonies

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Pat Croskerry. Acad Med 2003;78:775-780

Several Example Cognitive Errors

- Confirmation bias
  - The tendency to look for confirming evidence to support a diagnosis rather than look for disconfirming evidence to refute it
  - Clinician makes a presumptive diagnosis of upper respiratory infection in well-appearing patient presenting with cough, rhinorrhea, fever and does NOT consider pneumonia even after finding asymmetric chest wall excursion and dullness chest percussion on exam

- Diagnostic momentum
  - Once diagnostic labels are attached to patients they tend to become stickier and stickier, and becomes definite, and all other possibilities are excluded.
  - A patient was recently diagnosed with low back pain due to Qi / Blood stasis on UB channel, in a similar setting, a clinician that provides care to the patient now does not consider internal organ pattern such as damp phlegm obstructed in the Kidney as the source of low back pain.

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Pat Croskerry. Acad Med 2003;78:775-780

Several Example Cognitive Errors

- Framing effect
  - How diagnosticians see things may be strongly influenced by the way in which the problem is framed
  - A patient having a frequent visit for irritability and sadness in the setting of herbal non-compliance. There is a failure in exploring factors that drive herbal adherence, failure to explore alternative causes of current exacerbation.

- Representation error
  - Failure to take prevalence into account when estimating the probability of diagnosis
  - Clinician who often sees older patient places diverticular bleed high on her differential diagnosis when evaluating rectal bleeding in an adolescent patient

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Pat Croskerry. Acad Med 2003;78:775-780

Several Example Cognitive Errors

- Visceral bias
  - The influence of effective sources of error on decision-making. Countertransference, both negative and positive feelings toward patients, may result in diagnoses being missed.
  - Clinician assumes that a patient who is homeless will not be able to manage complicated treatment plan and prescribes simpler, less optimal plan, without discussing the options with the patient

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Pat Croskerry. Acad Med 2003;78:775-780

Chief Complaints

1) Patient S, 61 year old male, complains of blurry vision in the right eye and that both eyes water constantly.
2) Patient S, 61 year old male, complains of bloating and no appetite.

HPI - CC#1

The patient started to notice the blurry vision, tearing and redness about six months ago and has thus noticed it every day since. He explains that he can still see out of the right eye; it just seems like the image is blurry. Occasionally both of his eyes will itch. He also mentions that he wakes up with dried mucus in both eyes. When the problem first started around 6 months ago, the blurry vision and eye tearing was not as noticeable to the patient and that is why he did not seek immediate help for it. At the current time, the blurry vision and tearing is noticeable to the patient a few minutes upon waking up in the morning and constantly bothers him throughout the day. However, the blurry vision and eye watering does not bother S at night while he is sleeping. When asked about the severity of the blurry vision and eye tearing, Patient responds that it acts as a mild irritant that he wishes to resolve. Patient mentions that dry and damp weather tends to aggravate his eyes further. He reports no pain in either eyes, no headaches, no fever, and no tinnitus.

HPI - CC#2

During the past few years (patient cannot recall exactly when), patient reports feeling bloated in his abdominal region approximately 5 out of the 7 days in a week. He explains that he always feels the bloating and that it gets worse after eating meals. When asked about the quality of his bloating, the patient responds that it feels like an inflated balloon. When asked about the severity of the bloating, the patient responds that it creates mild discomfort. Patient reports no weight loss. S usually begins to notice the bloating mainly after eating a meal whether that be breakfast, lunch, or dinner. More acutely, starting 4 days ago, S states that he has had a low appetite with no desire for food. He also mentioned that he has noticed his bloating every single day since the low appetite started 4 days prior. He explains that when he thinks about food he is repulsed and that nothing sounds appetizing. He has been eating 1 meal a day for the past 4 days because of his low appetite.

HPI - CC#2 Cont.

S also sometimes feels nauseous when thinking about food and occasionally has a bitter taste in the mouth but there is no vomiting. S explains that he desires cool beverages. S has 3 to 4 bowel movements a day and the bowel movements have a sticky and wet quality. S also reports that his stools have a smelly odor and he can have gas that also has a smelly odor. When asked if he sees blood in his stools, S reports no. When asked about his energy level, S explains that normally his energy level is around a 7/10 (verbally). However, since the low appetite started 4 days ago, his energy level is a 3/10 (verbally).
Modifying factors: eating less seems to help with bloating

By Mathilda MacMillan, used with permission

Objectives

General Appearance: red cheeks, red eyes, visible distention of abdomen, general overweight figure, does not wear contacts or glasses
B: level of consciousness: fully conscious (compos mentis); likes to talk a lot and go off on tangents
C: Vital Signs:
Blood Pressure: 1st reading: 125/91 mm/Hg (L arm, sitting) ; 2nd reading: N/A ;
Heart Rate: 78 bpm, regular

Related Physical Exam

Left eye:
Eye muscle exam: no abnormal findings
Sclera is red and eye has tearing, no protruding eyeball, no swelling

Right eye:
Eye muscle exam: no abnormal findings
Sclera is red and eye has tearing, no protruding eyeball, no swelling

Objectives: Tongue and Pulse

Tongue:
Body: pale body, teeth marks along both sides, red tip
Coat: thick, wet, slightly yellow coat 2/3rds of the tongue from back to front

Pulse:
Left:
Cun = Normal speed, Middle depth, strong strength, Regular rhythm, full quality
Guan = Normal speed, Deep depth, Strong strength, wide, Regular rhythm, wiry
Chi = Normal speed, Deep depth, Strong strength, wide, Regular rhythm, slippery

Suggested for Supportive Diagnostic Tests

- Food and allergy sensitivity test: recommended if patient would like to fine tune diet by figuring out foods that may be aggravating bloating and digestion
- Colonoscopy: to investigate intestinal signs and symptoms
- Upper endoscopy: provides a view of the upper digestive tract
- Scintigraphy: This exam tests for gastroparesis and therefore would be used as a method of ruling out this condition. It involves eating a light meal that contains a small amount of radioactive material. A scanner that detects the movement of the radioactive material is placed over the abdomen to monitor the rate at which food leaves the stomach
- Blood lab test with added test for A1C (3 month average of glucose levels) to help manage diabetes

Related Physical Exam Cont.

Abdominal Region:
Inspection: visible distention of abdomen, no rashes, no bruises
Palpation: normal temperature, no palpable masses or hernia, no enlargement of abdominal organs found, negative rovsing's sign (no pain felt in the right lower abdomen upon palpation of the left side of the abdomen)
Percussion: N/A
Auscultation: N/A

Objectives - Pulse Cont.

Right:

Cun = Normal speed, Middle depth, Strong strength, Regular rhythm, Normal quality

Guan = Normal speed, Deep depth, Strong strength, wide, Regular rhythm, slippery

Chi = Normal speed, Deep depth, Strong strength, wide, Regular rhythm, slippery

Assessment

Differential Diagnosis: TCM Pattern: 1) Damp-Heat Retention in the Middle and lower Jiao 2) LV fire blazing up, 3) Hyperactivity of fire in the Stomach
Differential Diagnosis: WM for CC1: 1) allergic conjunctivitis, 2) stye, 3) Corneal abrasion ; WM for CC2: 1) irritable bowel, 2) gastroparesis, 3) colitis
Working Diagnosis: WM = allergic conjunctivitis ; ICD-10: H10.45 ; irritable bowel ICD-10: K58
Working Diagnosis TCM Pattern: Damp-heat in the middle and lower jiao ; ICD-11 SG71 (damp-heat in the middle energizer); ICD-11 SG72 (damp-heat in the lower energizer)

Eastern Diagnostic Approach

- The patient's symptoms of blurry vision, eye tearing, redness, abdominal bloating, low appetite, and sticky, frequent bowels are all connected and all related to Damp-Heat. This damp-heat resides in the middle and lower jiao in this patient. Therefore, the corresponding organs affected are the stomach, spleen, liver, gallbladder and large intestine organs since these are the organs that are found in the middle and lower jiaos.
- Classic Damp symptoms include heaviness and turbidity, heaviness in the body, fatigue. Since the SP "likes dryness and dislikes damp", dampness is likely to impair the SP leading to distention and fullness of the abdomen, poor appetite, and loose stools due to poor function of transportation and transformation.
- It is also characterized by stagnation and viscosity. This is seen in a sticky, thick tongue coating. This stagnation after a while will turn into heat. Heat symptoms manifest as preference for coolness, redness of the face and eyes, irritability, yellow tongue coat, etc.

Eastern Diagnostic Approach Cont.

- When there is damp-heat in the ST the corresponding symptoms will be eye redness, irritation and mucus secretions. This is because the stomach channel goes to the eyes and a characteristic of heat is that heat rises and goes up. When there is damp-heat in the LV there will also be signs of eye redness, tearing, and mucus secretions because the LV opens to the eyes and again heat will r
- Damp-heat in the large intestine can n
- From subjective we found complaints blurry vision. Other complaints includ the mouth, sticky frequent stools that preference for cool drinks.

Eastern Diagnostic Cont.

- From objective we found the patient to have red scleras, tearing, red cheeks, and a general overweight figure. The tongue body is pale, with teeth marks along both sides, and a red tip. The coat is thick, sticky, slightly yellow and is found on 2/3rds of the tongue from back to front.
- All of these suggest damp heat in the middle and lower jiaos and this damp-heat accumulation is creating heat to rise.

Eastern Differential Diagnosis

- The TCM differential diagnosis patterns for this patient is liver fire blazing up and hyperactivity of fire in the Stomach
- The following listed is why these are not the patterns the patient has and how we ruled this out.
- Liver fire blazing up: common symptoms include distending pain in the head, dizziness and vertigo, redness, swelling and pain of the eyes, a bitter taste and dryness in the mouth, irritability, burning pain in the coastal and a hypochondriac regions, tinnitus, yellow urine and constipation, hematemesis, hemoptysis, epistaxis, a red tongue with yellow coating and a string-taut and wiry pulse
    - We can rule out that this patient does not have LV fire blazing up because the patient does not have pain in his head, dizziness or vertigo. He does not have burning pain in the coastal and hypochondriac regions, tinnitus, constipation, or any bleeding symptoms. The patient does not have a red tongue and his pulse is slippery; not string-taut.

Western Diagnosis Approach

- CC#1:
  - Diagnosis of conjunctivitis is based on patient history, symptoms and examination of the eye
  - The standard clinical diagnosis includes any ages; pink or redness of sclera, swelling of the conjunctiva, secretion of mucus, increased tear production, itching irritation or burning
  - To support our diagnosis judgment, we need to review patients subjective and objective findings
  - From subjective, the chief complaint was blurry vision in the right eye; both eyes water constantly and are red. Occasionally both of his eyes will itch. He also mentions that he wakes up with dried mucus in both eyes. Patient mentions that dry and damp weather tends to aggravate his eyes further. He reports no pain in either eyes, no headaches, no fever, and no tinnitus.
  - Physical exam/objective: confirms that in both eyes the Sclera is red and the eyes have tearing, no protruding eyeballs, no swellings; no abnormal findings in eye muscle exam on both eyes
  - Based on all that is listed above, we can confirm patient has conjunctivitis (allergic)

Western Diagnosis Cont.

- From subjective we found the chief complaint #2 was bloating, low appetite, fatigue, sticky frequent stools with odor, gas with odor, nausea, bitter taste in the mouth, no pain - just mild discomfort from the bloating, no weight loss, no rectal bleeding, no anemia, no fever, no vomiting
- From physical exam/ objective: we found visible distention of abdomen, general overweight figure
- in the abdominal region:
  - Inspection: visible distention of abdomen, no rashes, no bruises
  - Palpation: normal temperature, no palpable masses or hernia, no enlargement of abdominal organs found, negative rovsing's sign
  - Percussion: N/A
  - Auscultation: N/A
- Based on all listed above and what can be ruled out, we can conclude the patient has irritable bowel syndrome

Western Diagnosis Cont.

- CC#2:
  - Diagnosis of irritable bowel syndrome is based on a complete medical history of the patient and tests to rule out other conditions.
  - will also likely assess whether the patient has other symptoms that might suggest another, more serious, condition. These include: onset of symptoms after age 50, weight loss, rectal bleeding, fever, nausea or recurrent vomiting, abdominal pain, especially if it's not related to a bowel movement, or occurs at night, diarrhea that is ongoing or awakens patient from sleep, anemia related to low iron
  - Lactose-intolerance test, and stool tests to check for infection may be used as a way to rule out other conditions
  - After other conditions are ruled out, these sets of diagnostic criteria may be used: Rome criteria and types of IBS (based on on patient's symptoms: constipation-predominant, diarrhea-predominant, mixed or unclassified)
  - Standard symptoms of IBS include: any age, cramping, abdominal bloating, gas, and diarrhea or constipation

WM Differential Diagnosis

- The WM differential diagnosis for this patient is eye stye and corneal abrasion
- The following listed is why these are not the patterns the patient has and how we ruled this out.
- Eye stye: a stye is a red, painful lump that forms near the edge of the eyelid. Symptoms include eye pain, redness, swelling and tearing
  - We can rule this condition out because the patient does not have a lump near his eyelids causing his symptoms of redness, blurry visions, tearing and itchiness.
- Corneal Abrasion: scratch on the cornea of the eye caused by dust, dirt, sand, metal particles, contact lenses, etc. Symptoms include pain, blurry vision, gritty feeling in the eye, redness, headache, sensitivity to light.
  - We can rule this condition out because the patient does not recall an event in which a foreign substance scratched his eye. The patient also does not have any eye pain, gritty feeling in the eye, or headache.

Plan

Treatment Goal:

- Current goal: reduce stress, decrease abdominal bloating, improve appetite, decrease eye tearing and improve blurry vision
- Short term goal: reduce stress, decrease abdominal bloating, improve appetite, improvement eye tearing and improve blurry vision in progression towards complete recovery
- Long term goal: no more eye redness, watering, or blurry vision, appetite is normal and bowel movements are normal, no abdominal bloating; patient has an understanding on what he can do to maintain this recovery

Treatment Principle Cont.

OM treatment principle:

- Clear Damp-heat in middle (LV/GB, ST/SP) and lower jiao (LI)
- Strengthen spleen to support normal transformation and transportation

Collaborative Treatment:

- Collaboration with primary physician to stay up to date on patient's current condition of type II diabetes
- Refer patient to certified nutritionist for dietary guidelines concerning type II diabetes

Prognosis:

Ad Vitam: good

Ad Functionam: good

Ad Sanationam: healed

Treatment Principle

WM treatment principle: relieve allergic conjunctivitis symptoms

1) Allergic conjunctivitis:

- Anti-allergy eye drops or oral medications
- Avoid allergens, refrain from rubbing eyes
- Cold compress

2) Irritable Bowel Syndrome: treat and relieve symptoms of IBS, supportive approach on dietary and nutrition

- Treatment is focused on relieving symptoms
- Avoid foods that trigger your symptoms: Eat high-fiber foods, drink plenty of fluids
- Exercise regularly and get enough sleep
- High gas foods and gluten may be suggested to be eliminated from patient's diet
- Medications such as laxatives or anti-diarrheal and and pain medications may be recommended

Thank You