Basics of Effective Pain Management

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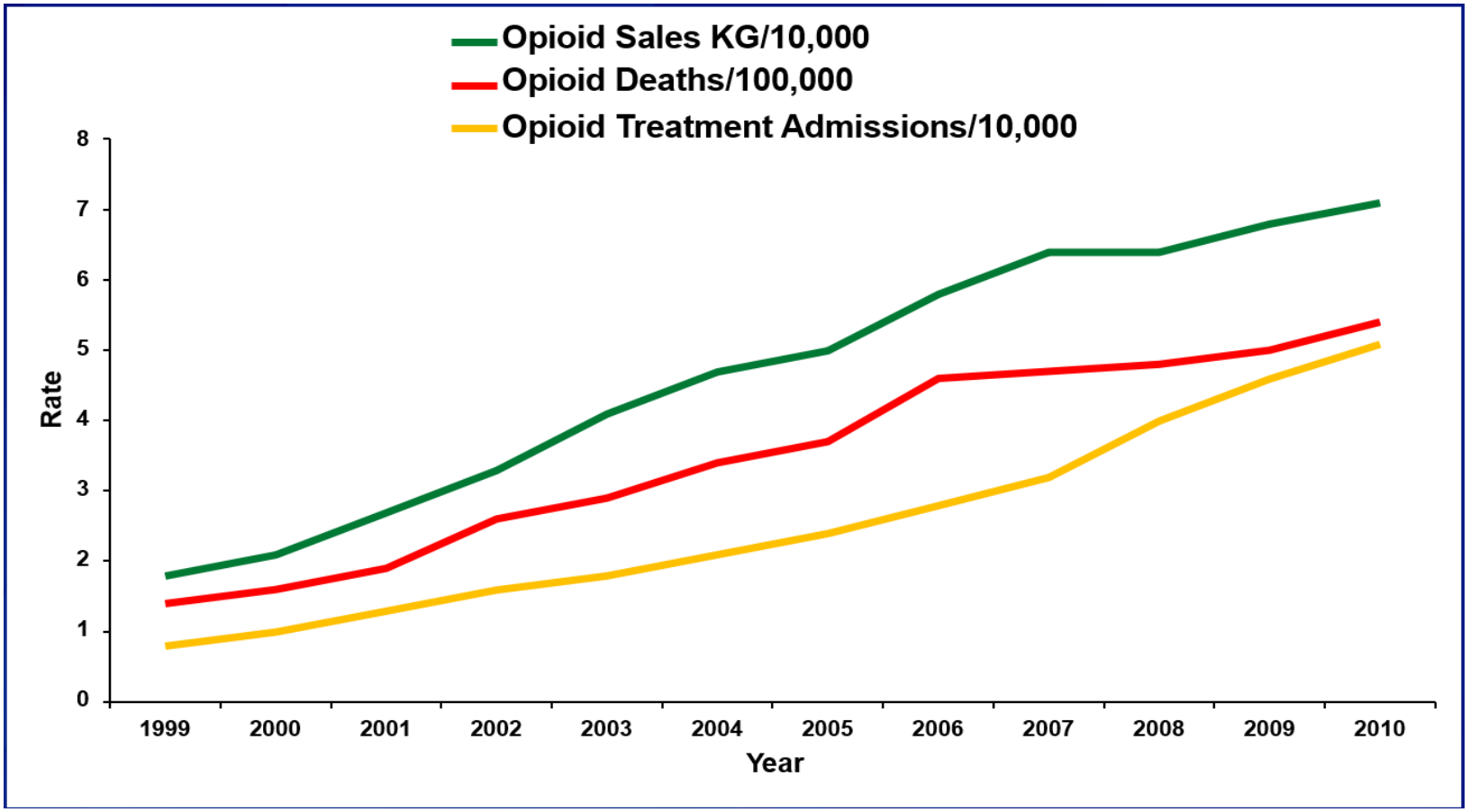
Disclosure

- I do not have any financial interest, arrangement, or affiliation that could be perceived as a real or apparent conflict of interest related to the content of this activity.

Diversion

Rates of opioid overdose deaths, sales and treatment admissions, US, 1999-2010[7]



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Pain

Pain

An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage

International Association for the Study of Pain (2020)

Pain

and cognitive

An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage

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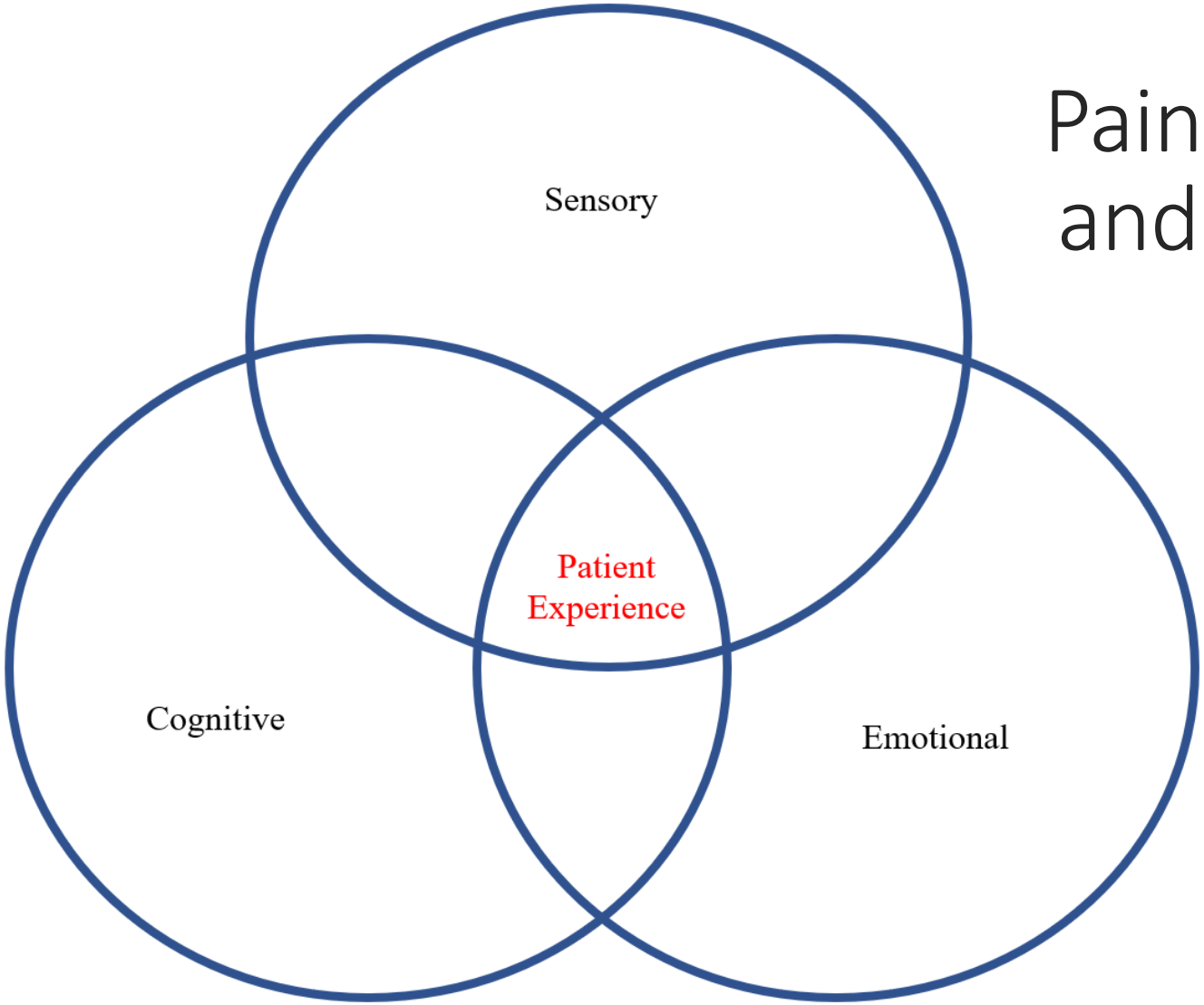
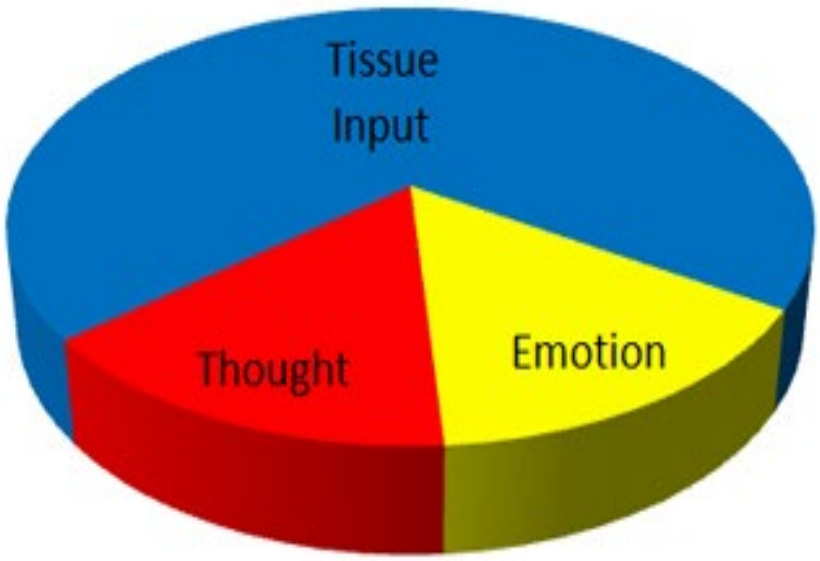
Pain evaluation and treatment in 3D



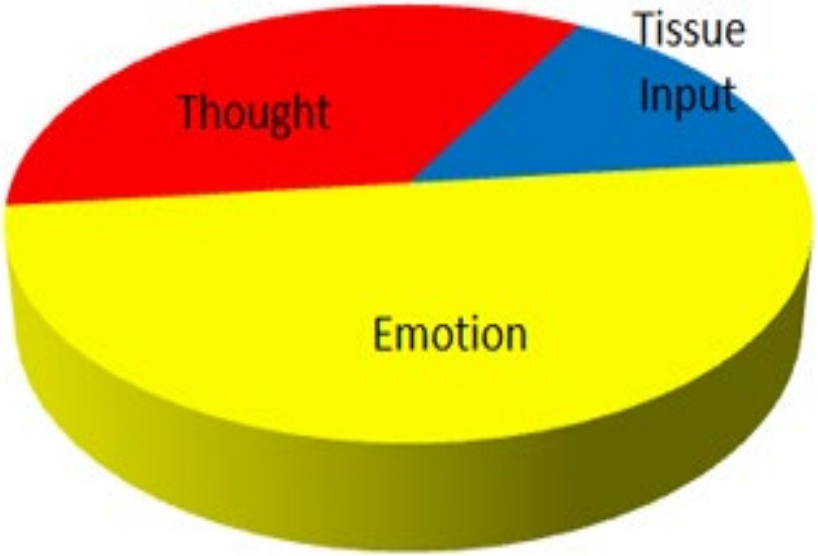
Pain – Two types

- Acute pain: Pain < 3 months
- Chronic pain: Pain > 3 months
- Acute pain is a *symptom*
- Chronic pain is a *disease*

Emotional component of acute & chronic pain



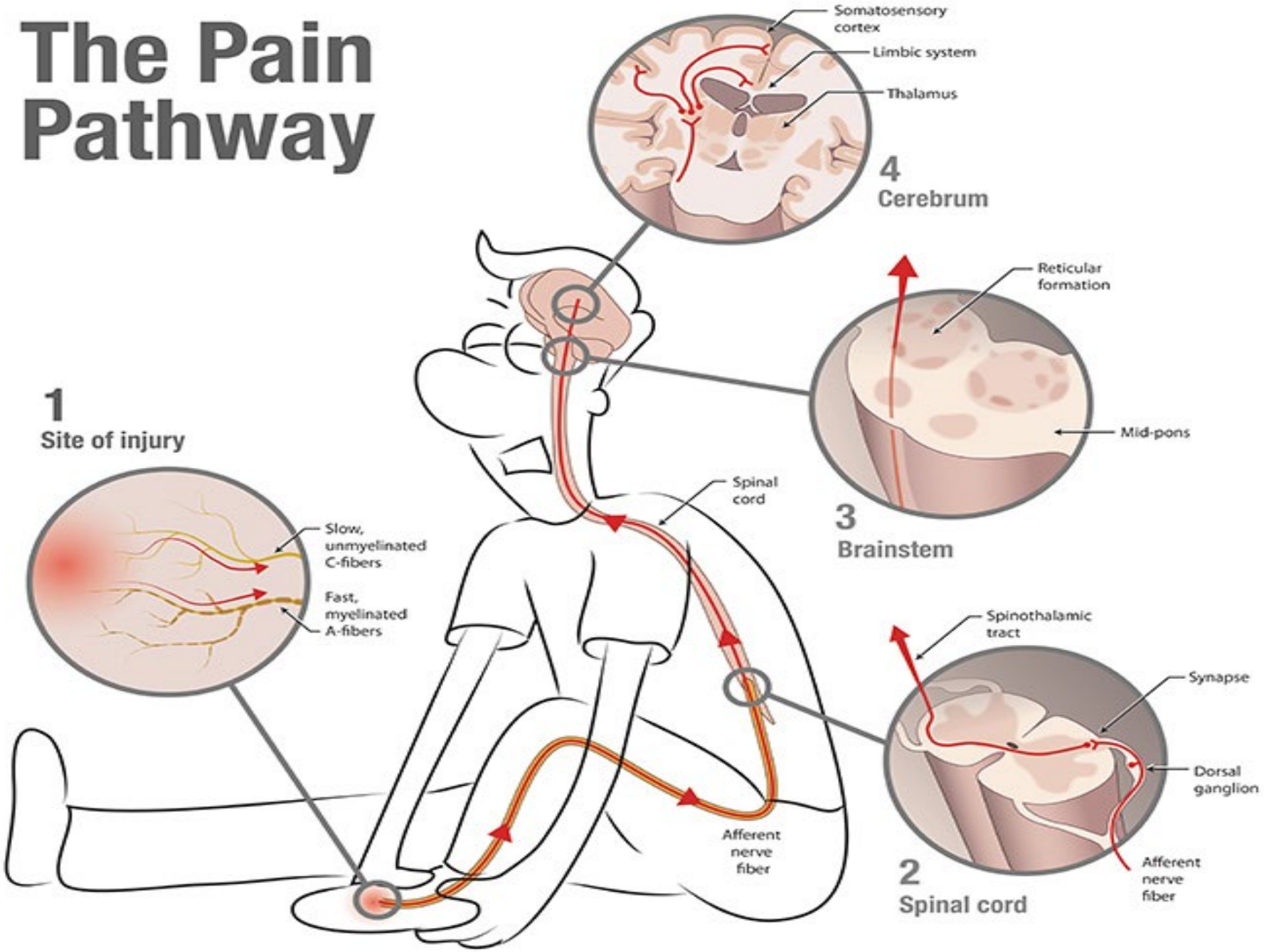
Acute pain

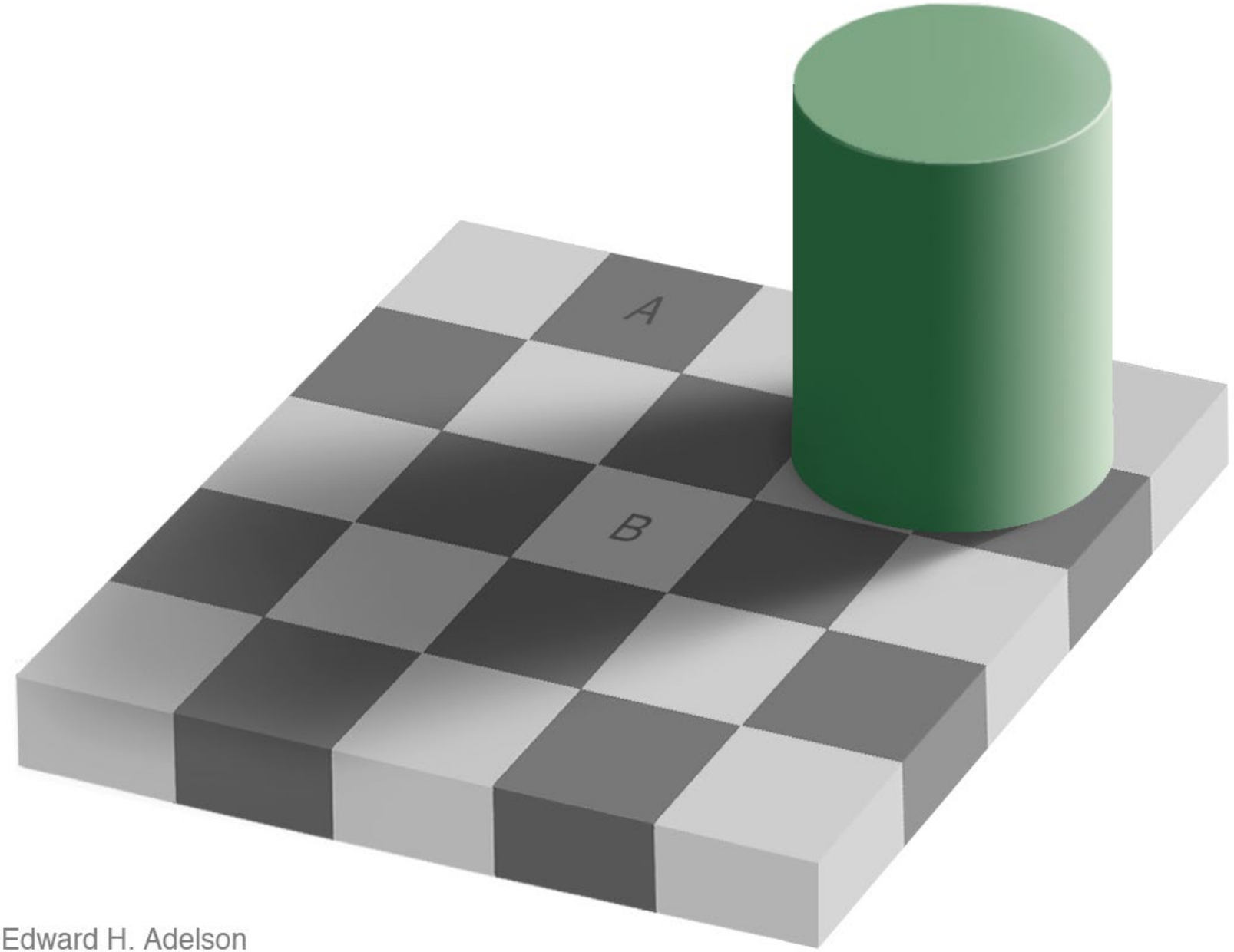


Chronic pain

Our brains change how we feel pain.

The Pain Pathway





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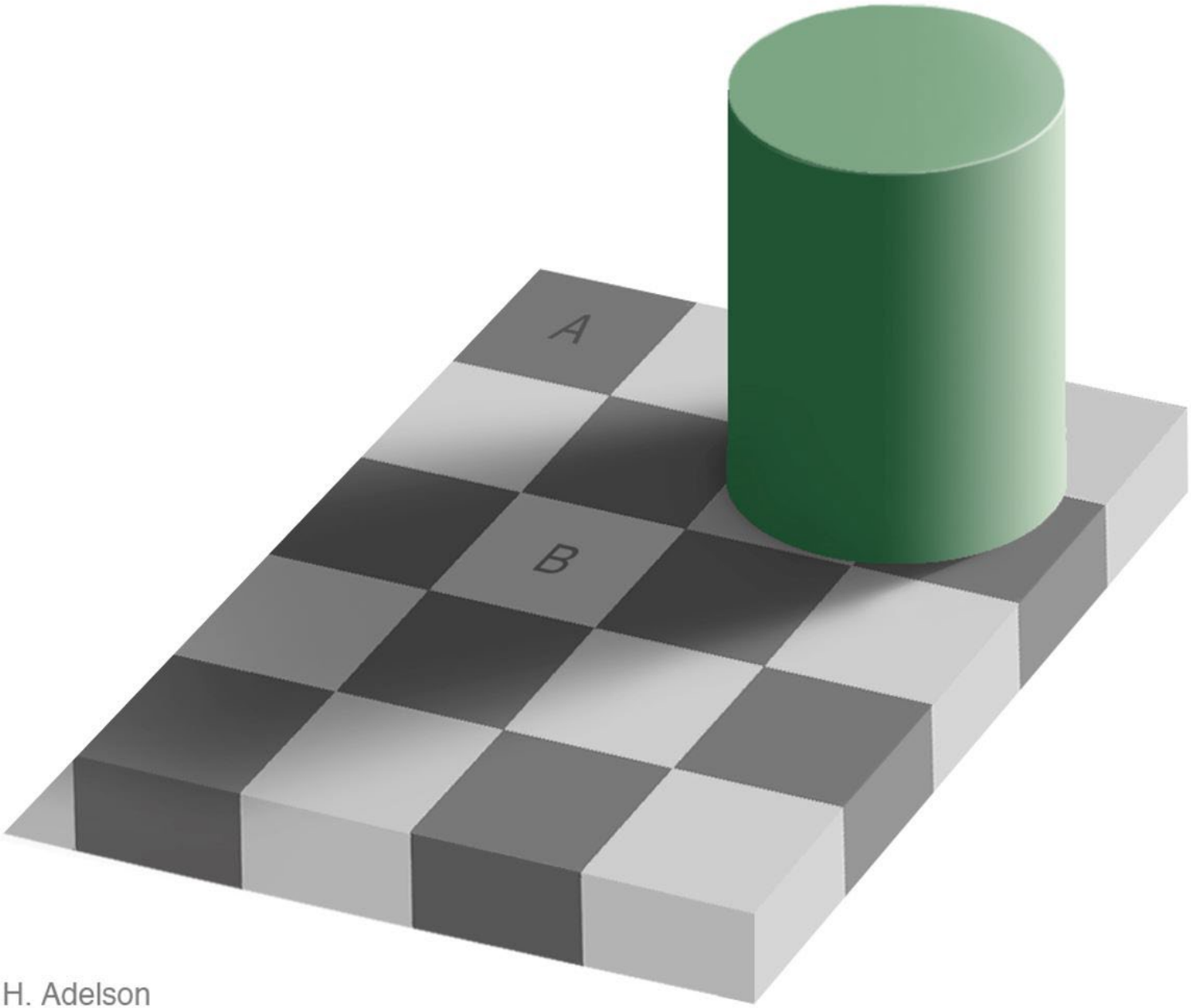

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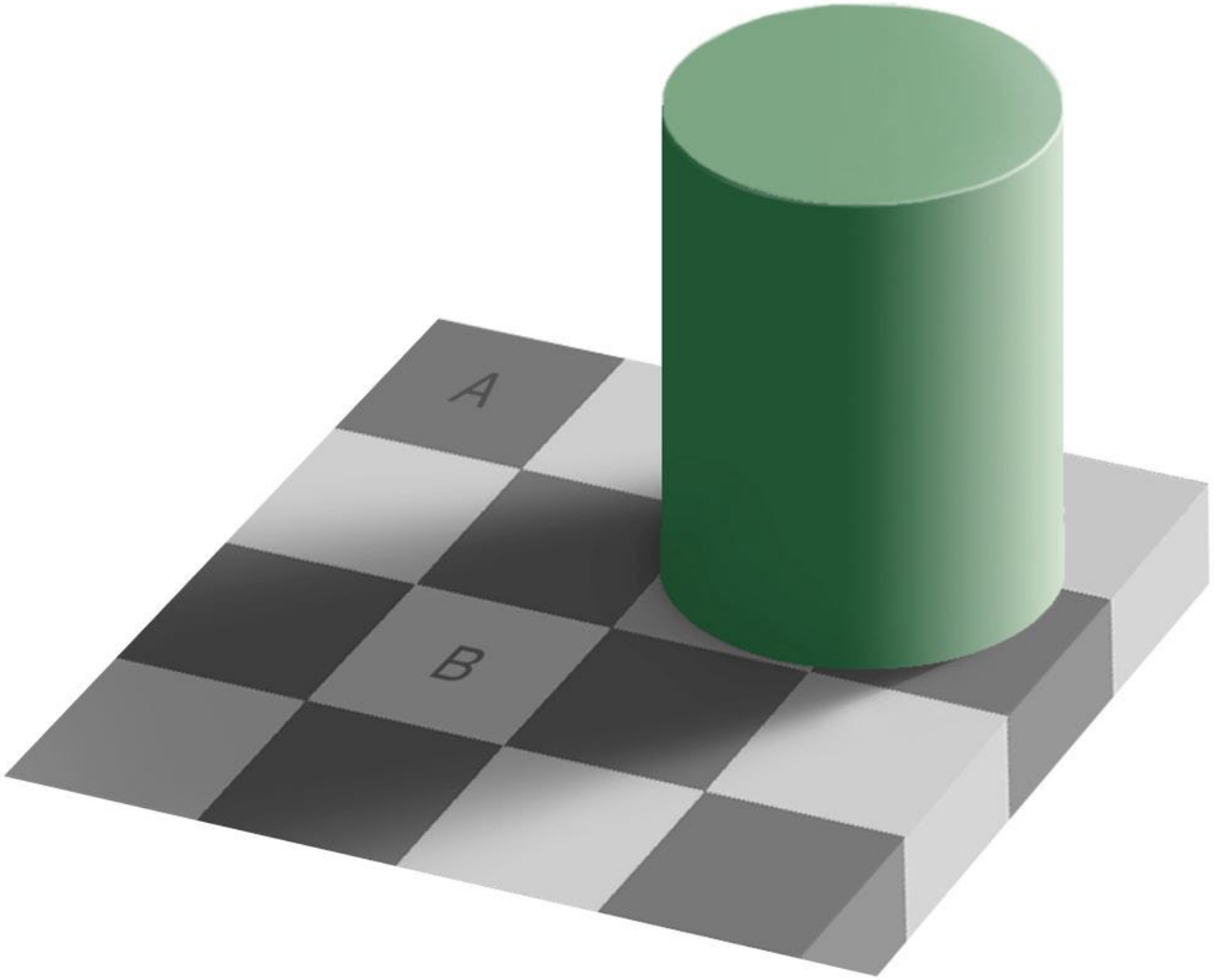

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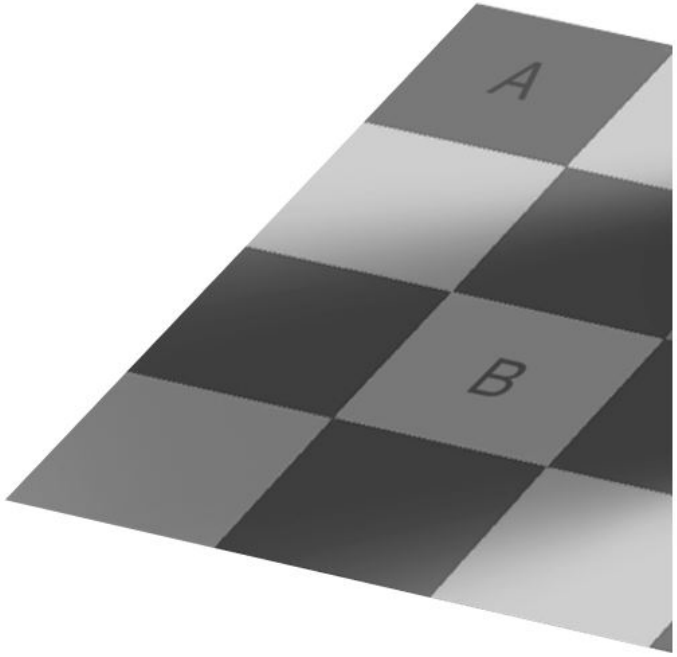

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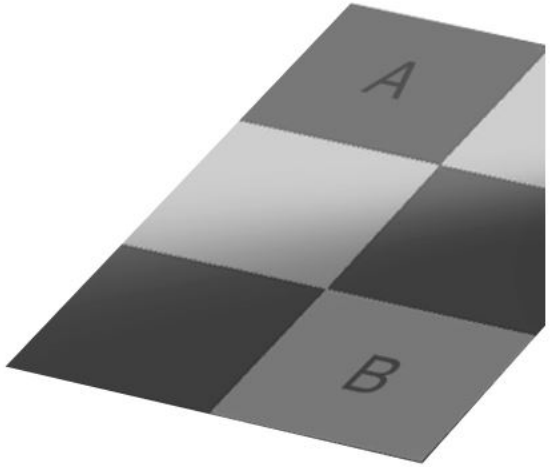

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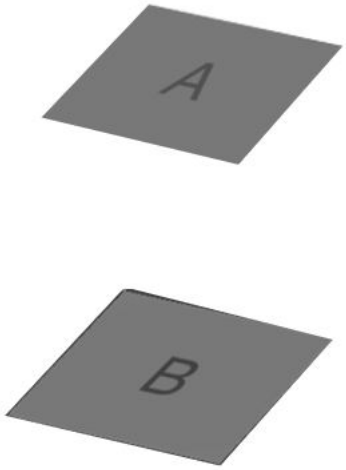

A
B

Lightness constancy

3 mechanisms of pain

- Nociceptive
- Neuropathic
- Nociplastic
  - **Central sensitization**

3 mechanisms of pain

- Nociceptive – The way pain is supposed to work
- Neuropathic – **Damage** to the nervous system
- Nociplastic – **Changes** to the nervous system

Central sensitization syndromes

Fibromyalgia

Chronic headaches

Irritable bowel syndrome

Chronic neck pain

Chronic back pain

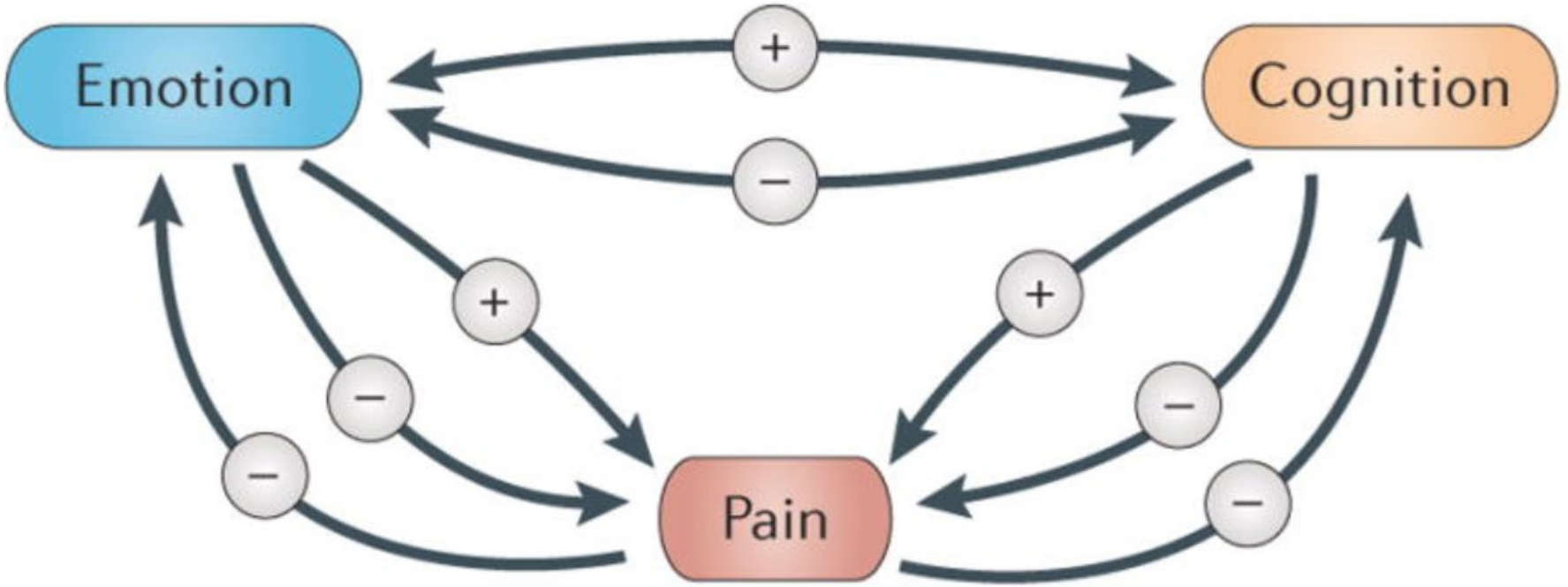
Interstitial cystitis

All chronic pain???

Pain

An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage

International Association for the Study of Pain (2020)



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Opioids

Common quote:

"Opioids are the most potent medications we have for treatment of pain."

ASAM Principles of Addiction Medicine – Fifth edition (2014). Chapter 97. Pg. 1500.

Unfortunately, we confuse potency with efficacy.

Poppy plant

All addictive substances and behaviors stimulate dopamine

- Opioids
- Alcohol
- THC
- Cocaine
- Methamphetamine
- Nicotine
- Gambling
- Eating
- Sex
- Others

Opioids are different…

Dopamine

+

Opioid receptors

Opioid receptors and endorphins

- What is the purpose of our endorphins?
- Enable us to achieve a goal (short term)[23,24]
  - Decrease pain (minimal effect)
  - Increase motivation
  - Improve confidence
  - Increase reward
  - Reduce depression and anxiety
  - Increase "warmth-liking"[25]
    - Liking warm things
    - Interpersonal bonding

Polunina AG, Bryun E a. Neuropsychological Functions of μ- and δ-Opioid Systems. ISRN Addict. 2013;2013:1-13. doi:10.1155/2013/674534.

Schweiger D, Stemmler G, Burgdorf C, Wacker J. Opioid receptor blockade and warmth-liking: Effects on interpersonal trust and frontal asymmetry. *Soc Cogn Affect Neurosci*. 2014;9(10):1608-1615. doi:10.1093/scan/nst152.

Primary purpose

- Dopamine – Our primary reward system. This is what we live for.

- Endorphins and opioid receptors – These maximize our ability to achieve the reward.
- This is our “success system”!

The “Dorothy Reaction”

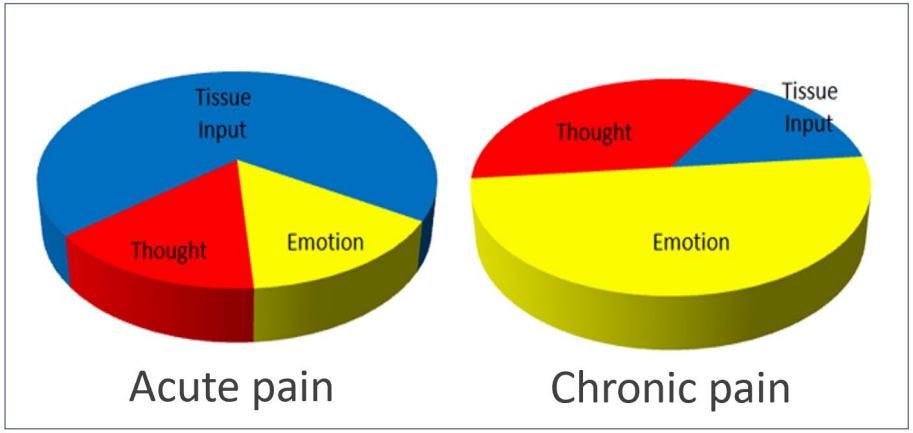
- Occurs in susceptible individuals on exposure to opioids
  - Those with acute or chronic stress/anxiety
  - Those with depression
  - Those with a genetic predisposition
  - Those with substance use disorder (including smoking)
  - Those with childhood or adult trauma
  - Those with historical/generational trauma
  - Others…

The problems with opioids

- Mentally impairing[8,9]
- Delay recovery[10,11]
- Increase medical costs[12]
- Opioid hyperalgesia[13,14]
- Double the chance of disability (if prescribed for 7 days or more)[15]
- Increase falls and fractures[16]
- Cardiac: Individuals on opioids have 3 times higher incidence of MI c/w age-matched controls. [17,79]
- GI bleeding[18]
- They are very calming[86] (Initially calming but with tolerance, anxiety increases)
- Treat depression[19] (Initially depression improves but after one month, depression is worse)
- Diversion (4-24% of prescribed opioids are used non-medically)[75]
- One prescription to an individual will triple the risk that a family member will overdose[80]
- Brain changes[20]
- Addiction[21,22]
  - Up to 40% of people on chronic opioid therapy meet the criteria for opioid use disorder.97

Opioids and central sensitization

- Opioids should probably never be used when there is a significant component of central sensitization!
- Opioids initially relieve the depression and anxiety that drive pain in CS but with ongoing use make these worse and therefore make pain worse.



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American Academy of Neurology - 2014

In a position paper in 2014, AAN recommended against using opioids for

- Fibromyalgia
- Chronic back pain
- Chronic headaches

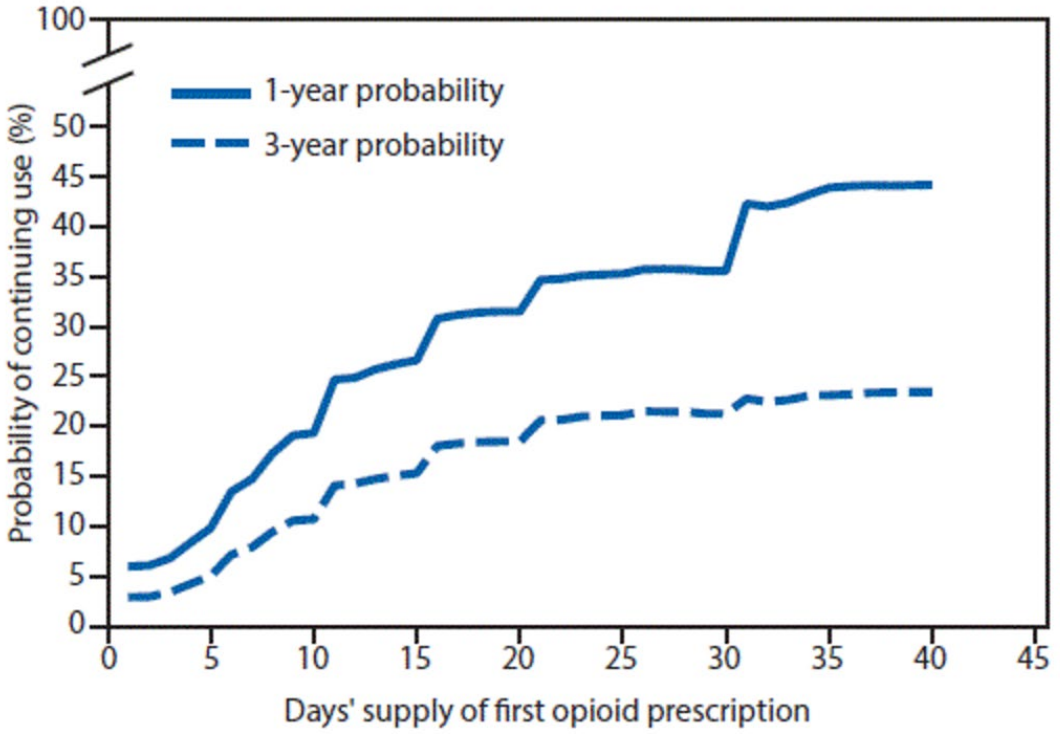
Franklin, G. M. (2014). Opioids for chronic noncancer pain: A position paper of the American Academy of Neurology. Neurology, 83(14), 1277–1284. https://doi.org/10.1212/WNL.0000000000000839

Addiction

Acute rx leads to long-term use[47]

- Duration of acute use:
- 1 day = 6% chance of still using that drug a year later
- 8 days = 13.5%
- 31 days = 29.9%

Of all opioids, tramadol was the worst!



Many other studies have now shown this same risk

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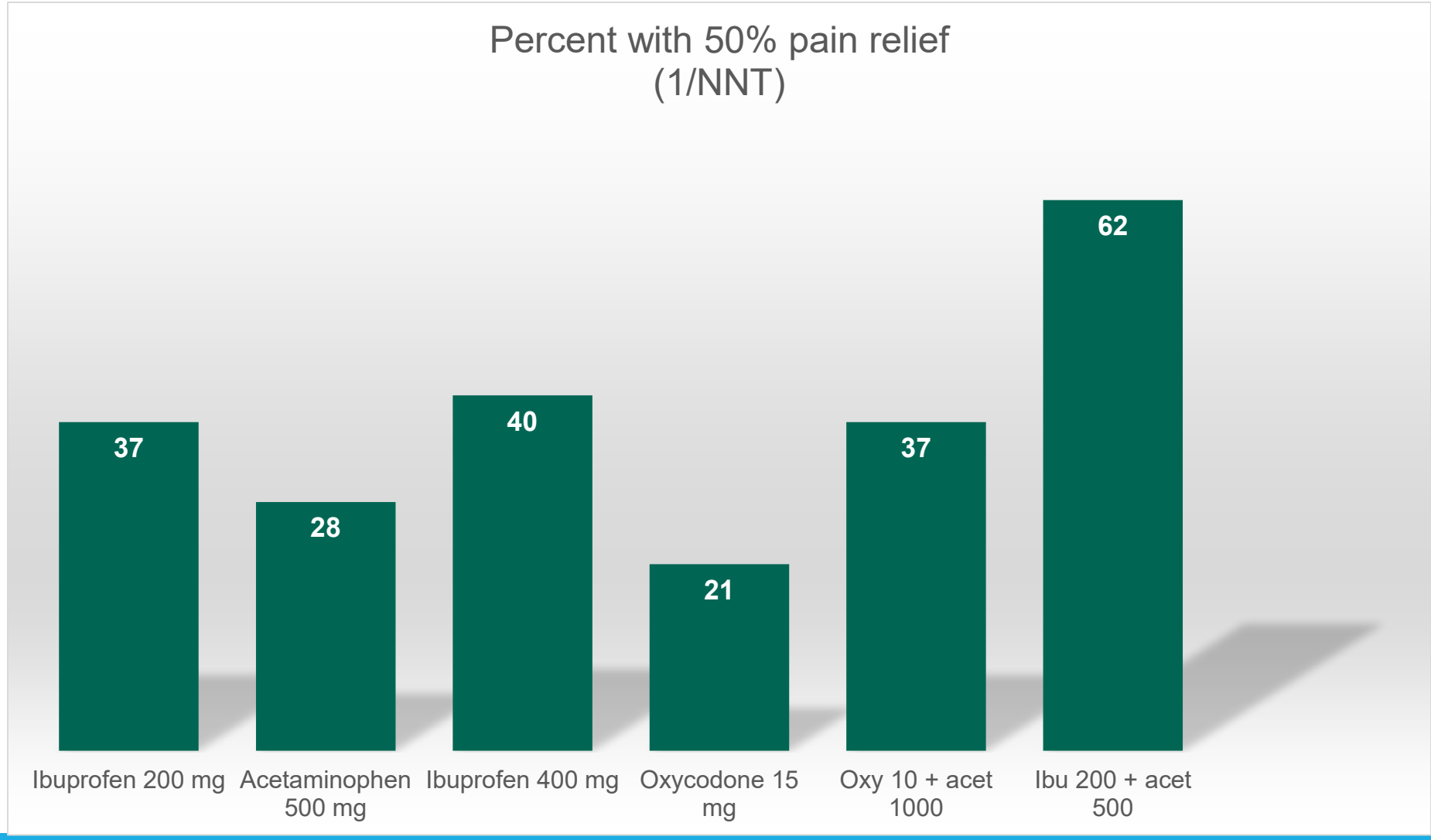
Treating Pain

Efficacy of pain medications for acute pain[26,27,51]



AAFP/ACP recommendations for pain from MS injuries

1) …treat patients with acute pain from non-low back, musculoskeletal injuries with topical nonsteroidal anti-inflammatory drugs (NSAIDs) with or without menthol gel as first-line therapy….

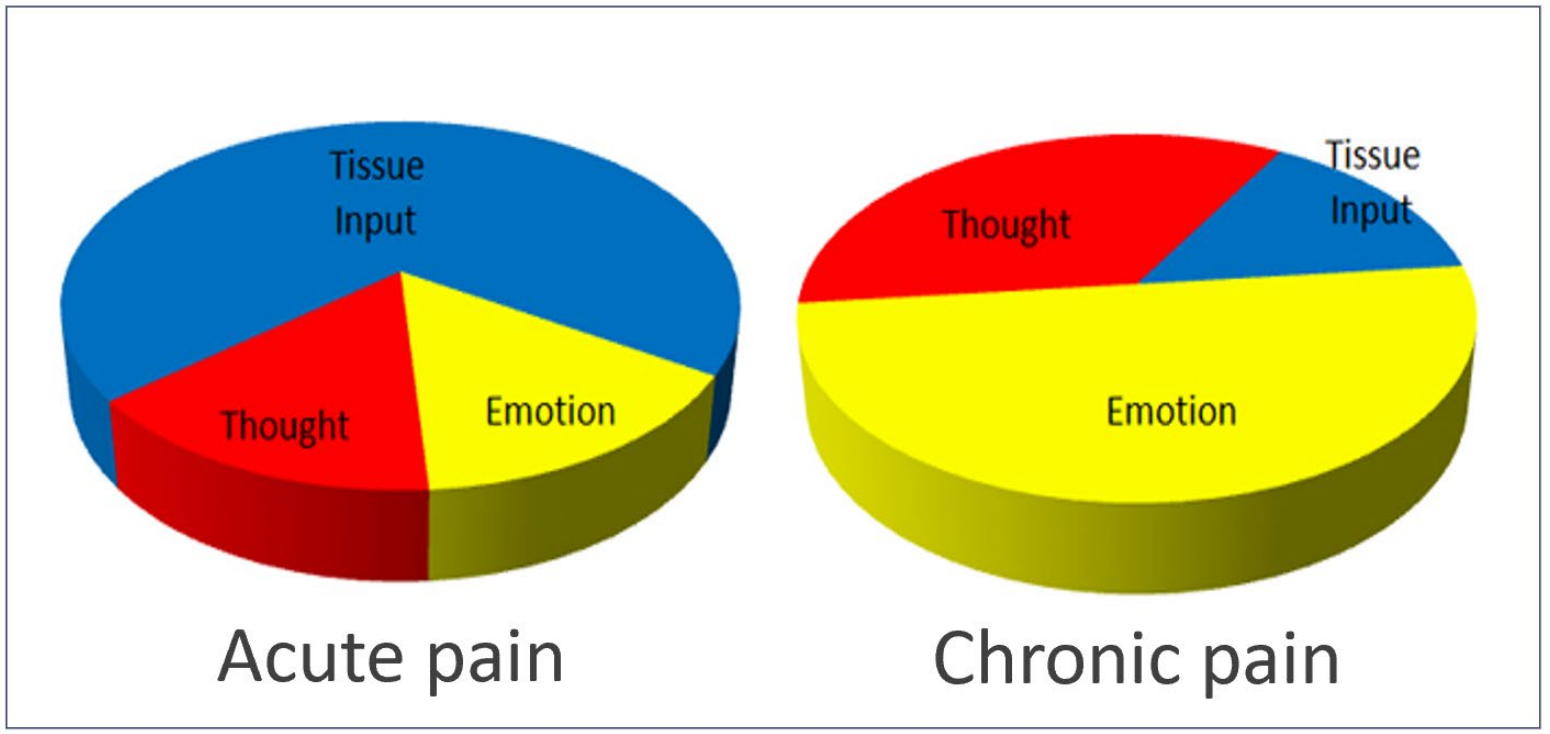
2a) …oral NSAIDs to reduce or relieve symptoms, including pain, and to improve physical function, or with oral acetaminophen to reduce pain….

2b) …specific acupressure to reduce pain and improve physical function, or with transcutaneous electrical nerve stimulation….

3) …against clinicians treating patients with acute pain from non-low back, musculoskeletal injuries with opioids, including tramadol.

Chronic pain

- Completely different from acute pain!



Conclusions of a 2022 review of 71 randomized controlled trials of the effectiveness of full opioids, by the Agency for Health Care Research and Quality (AHRQ):

(1) For opioids *compared to non-opioid pharmacotherapy* beyond one month of therapy there is either no evidence of effectiveness for pain or function, or evidence of lack of effectiveness.

(2) For opioids *compared to placebo* beyond one month of therapy, there is evidence of slight effectiveness for pain with an average reduction of 0.8 points on a 10 point scale at 1 – 6 months; there is no-evidence of effectiveness at 6-12 months; and there is evidence of lack of effectiveness at 12 months.

(Chou 2022)

But a minimum change of 1 point on a 10 point scale (Dworkin 2008) or 2 points on a 10 point scale (Farrar 2000), (Salaffi 2004), (Haag 2003) has been proposed as a threshold for a ***clinically meaningful*** change in pain scores.

Chou, R., Selph, S., Wagner, J., Ahmed, A. Y., Jungbauer, R., Mauer, K., Shetty, K. D., Yu, Y., & Fu, R. (2022). Systematic Review on Opioid Treatments for Chronic Pain: Surveillance Report 3. https://www.ncbi.nlm.nih.gov/books/NBK589631/

Chou, Roger: Presentation: ASAM Pain and Addiction: Common Threads Course XXV - April 2024 Session 2: The State of Evidence-based Pain Care, accessed 7-29-2024 https://elearning.asam.org/products/asam-pain-and-addiction-common-threads-course-xxv-2024#tab- product_tab_contents__18

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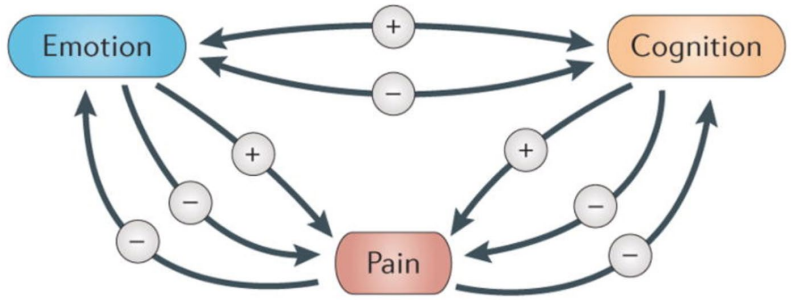
Salaffi F, et al. Minimal clinically important changes in chronic musculoskeletal pain intensity measured on a numerical rating scale. *European Journal of Pain* 2004 Aug;8(4):283-91.

Hagg O, et al. The clinical importance of changes in outcome scores after treatment for chronic low back pain. *European Spine Journal* 2003 Feb;12(1):12-20.

Treatment of chronic pain

- Behavioral therapy[33] (CBT, mindfulness, others)
- PT/OT
- Treatment of mood disorders
- Exercise
- Distraction



- Acupuncture, yoga, tai chi, and other alternative therapies
- Amitriptyline, duloxetine, gabapentin and similar drugs may help a little
- Low-dose naltrexone and buprenorphine may help

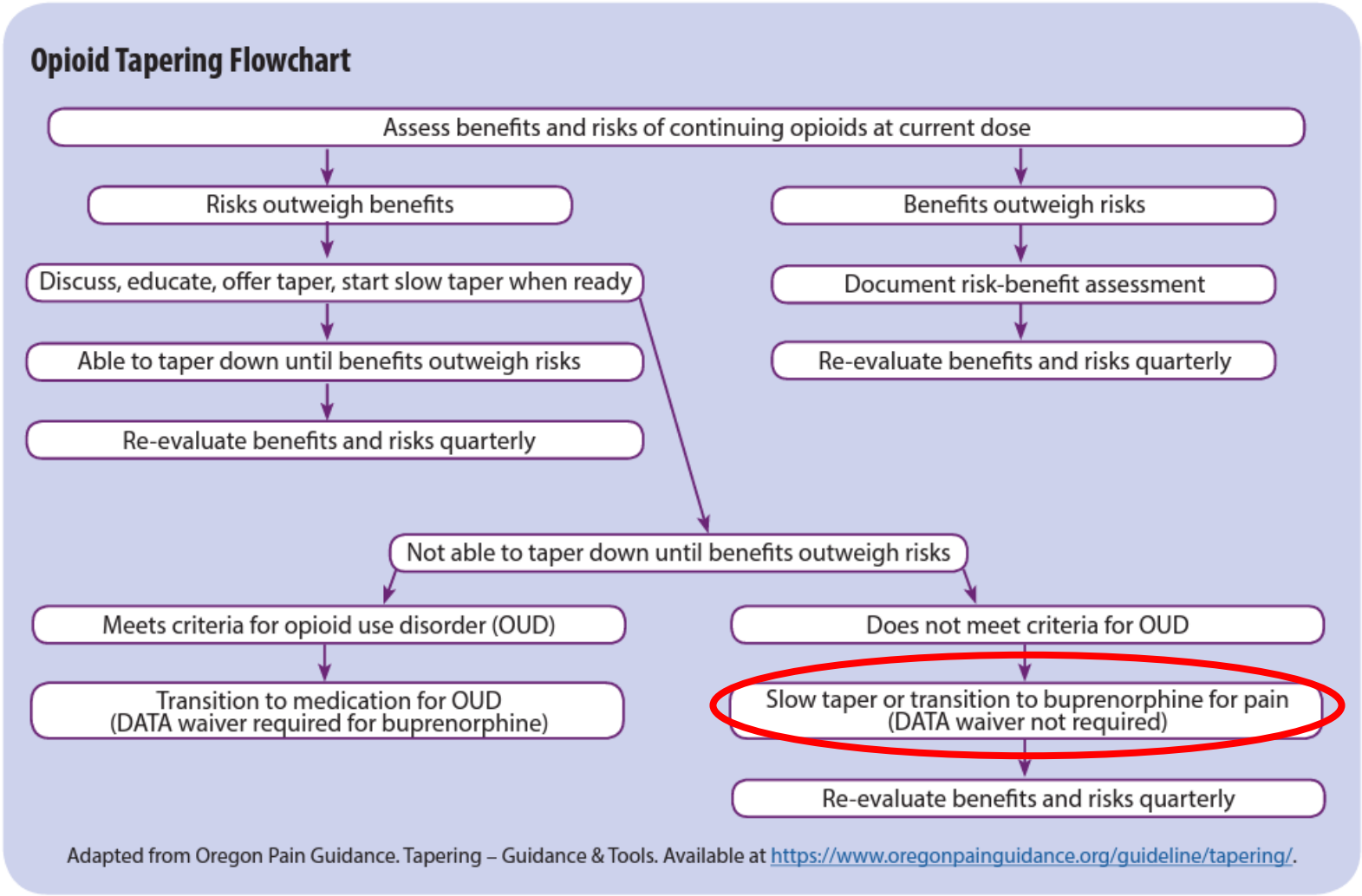
Low-dose naltrexone

- Reduces inflammation in nerve tissue
- Dose must be compounded (0.5-4.5 mg once a day)
- Essentially no side effects
- May be added to individuals on chronic opioids
  - May reduce opioid induced hyperalgesia
  - Use the lower dose – 0.5 mg q day
- Works especially well for people with nociplastic pain (fibromyalgia, chronic low back pain, chronic neck pain, chronic daily headaches, etc.)

Tapering

- For people on opioids with chronic pain – tapering is HARD!
- For people who do taper off opioids
  - Their pain decreases
  - Their risk of dying increases

U.S. HHS taper guideline



Buprenorphine for addiction and pain

1. Powerful opioid pain medication
   - 1 mg SL bupe = 30 mg MSO4
2. Tolerance does not develop
3. Has a ceiling effect on respiratory depression
   - But not pain relief!
4. Is a wonderful antidepressant (kappa blocker)
5. Is effective in neuropathic pain
6. Is not immunosuppressive
7. High affinity for the opioid receptor

Buprenorphine also…

8. No hormonal effects
   - HPA axis
   - Sex hormones - testosterone
9. Is less impairing
   - Safer in the elderly
10. Does not affect the QT interval
11. Safe in renal insufficiency or renal failure
12. Easier to wean
13. People on stable doses do not feel high!

Procedures

- No procedures have good evidence for long-term pain relief.
- Scrambler therapy may be one exception.

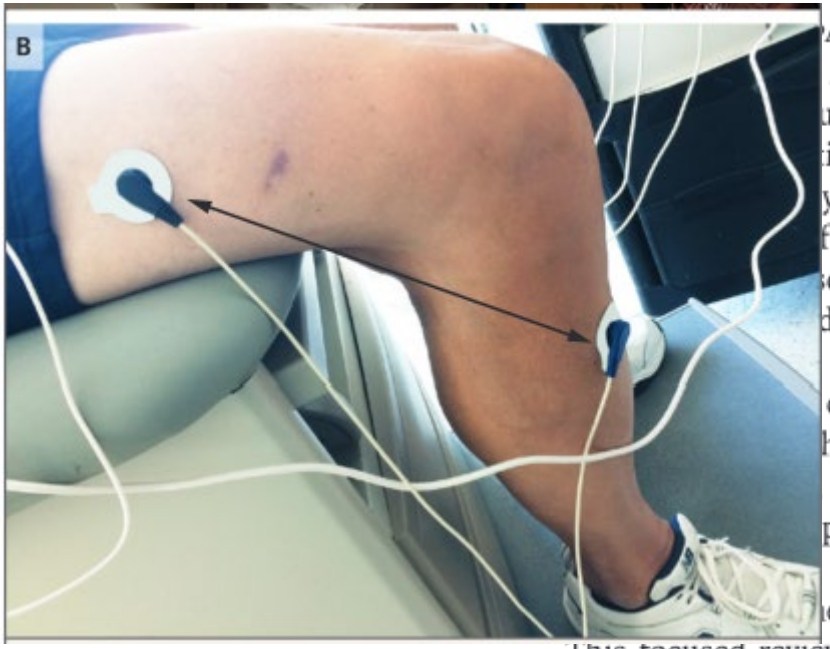
The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

Dan L. Longo, M.D., *Editor*

Cutaneous Electroanalgesia for Relief of Chronic and Neuropathic Pain

Thomas J. Smith, M.D., Eric J. Wang, M.D., and Charles L. Loprinzi, M.D.



AIN, DEFINED AS PAIN THAT PERSISTS FOR MORE THAN
is a major global health problem and affects as many as 100
ults in the United States alone. Besides the suffering, chronic
ion up to $894 billion each year in medical treatment and lost
y common pharmacologic pain treatments do not always man-
ffectively (especially neuropathic pain, which is caused by a lesion
omatosensory nervous system),[2] and their use may increase the
d adverse outcomes such as addiction (e.g., opioid addiction) and

clinical guidelines recommend nonpharmacologic therapies.[3]
h is electroanalgesia, which has been used since Greco-Roman
Aristotle, and Plutarch recommended that patients with chron-
pool of water containing electric rays in order to receive analge-
currents.[4] Today, common forms of cutaneous electroanalgesia
eous electrical nerve stimulation (TENS) and scrambler therapy.
This focused review provides an overview of the physiological effects of each ap-

When are opioids definitely indicated?

- Following severe trauma (for a short period)
- End of life
- For treating opioid use disorder

Summary

- Pain is a complex problem
- We need to think beyond pills

Thank you!

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Microglia and neuroinflammation

- Microglia represent a specialized population of macrophages-like cells in the central nervous system (CNS) considered immune sentinels that are capable of orchestrating a potent inflammatory response.
- Microglia are felt to be responsible for most nociplastic and neuropathic pain.

- Bachiller S, Jiménez-Ferrer I, Paulus A, et al. Microglia in neurological diseases: A road map to brain-disease dependent-inflammatory response. Front Cell Neurosci. 2018;12. doi:10.3389/fncel.2018.00488

2-year prospective cohort study on opioids for chronic pain

A total of 529 subjects were matched and included in the analysis. Rate of prescription opioid use was 59.7% at baseline, which increased to 70.3% over 2 years, of which 42.7% of the prescriptions were for strong opioids.

Opioid users reported no improvement regarding pain symptoms, physical function, emotional function, and social/familial disability.

Veiga DR, Monteiro-Soares M, Mendonça L, Sampaio R, Castro-Lopes JM, Azevedo LF. Effectiveness of Opioids for Chronic Noncancer Pain: A Two-Year Multicenter, Prospective Cohort Study With Propensity Score Matching. J Pain. 2019;20(6):706-715. doi:10.1016/j.jpain.2018.12.007