The Art of Pain Management

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Pain, the Universal Problem

- Pain engages us at an emotional level
- Pain plays a protective role for survival
- It sends a signal that nature assures we cannot ignore.
- We focus attention on the affected area and marshal our resources to prevent further injury.
- Pain Illustration by Rene' Descartes
  - Reflexively withdraw foot
  - Avoid situation in the future
  - Limit activity, enabling healing to occur

Fellers J.C. (2016) Theories of Pain and Addiction: Type of Pain, Pathways to Opiate Addiction. In: Matthews A., Fellers J. (eds) Treating Comorbid Opioid Use Disorder in Chronic Pain. Springer, Cham

A Review of Pain

- Biopsychosocial Model: pain is more than a biological phenomenon
- The mind–body connection between pain and psychological factors
- Emotional distress may predispose to and perpetuate pain
- Anxiety, depression, and anger are among the negative affect states involved in pain perception.
- Opioid medications can lessen psychiatric symptoms
- Prior to modern antidepressants, opiates were commonly used to treat depression.
- Pain is a uniquely individual experience

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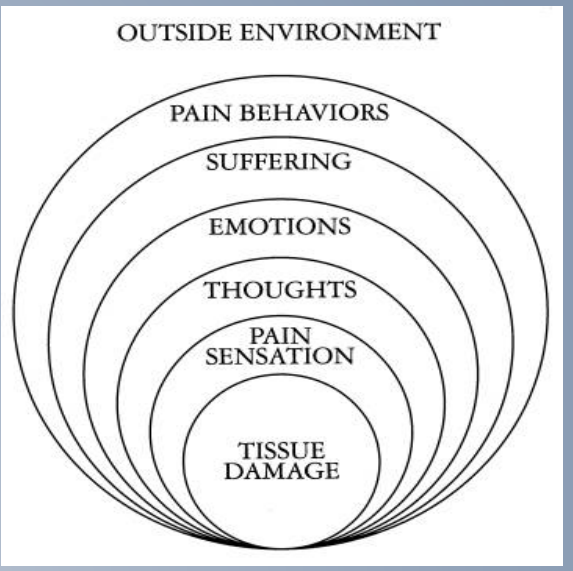
Risk Factors for Chronic Pain Among Adults

Factors associated with chronic pain.

Modifiable	Pain
	Mental health
	Other co-morbidities
	Smoking
	Alcohol
	Obesity
	Physical activity/exercise
	Sleep
	Nutrition
	Employment status and occupational factors
Non-modifiable	Age
	Sex
	Cultural background
	Socioeconomic background
	History of trauma/injury/interpersonal violence
	Heritable factors (including genetic)

Van Hecke O, Torrance N, Smith BH. Chronic pain epidemiology - where do lifestyle factors fit in?. *Br J Pain*. 2013;7(4):209–217. doi:10.1177/2049463713493264

Pain Catastrophizing

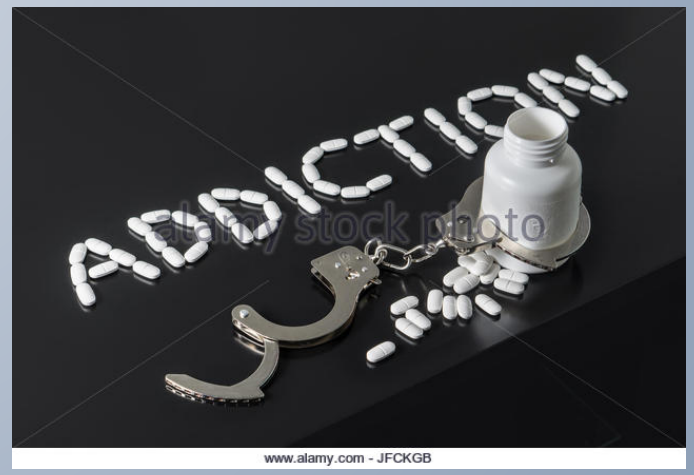


- Negative cognitive-affective response to anticipated or actual pain.
- An intensified emotional reaction to the pain experience to gain intimacy and closeness with others, and to solicit instrumental support
- It has been defined as “the tendency to magnify or exaggerate the threat value or seriousness of pain sensations”

Sullivan MJ, Thorn B, Haythornthwaite JA, et al. Theoretical perspectives on the relation between catastrophizing and pain. *Clin J Pain.* 2001;17(1):52-64.

Development of Addiction

- Healthcare providers may introduce patients to the effects of opioids when prescribing for painful medical conditions.
- This differs from how the initial exposure of many other potentially addictive drugs occurs.
- It has been recognized for some time that the risk for addiction with opioids is significant.



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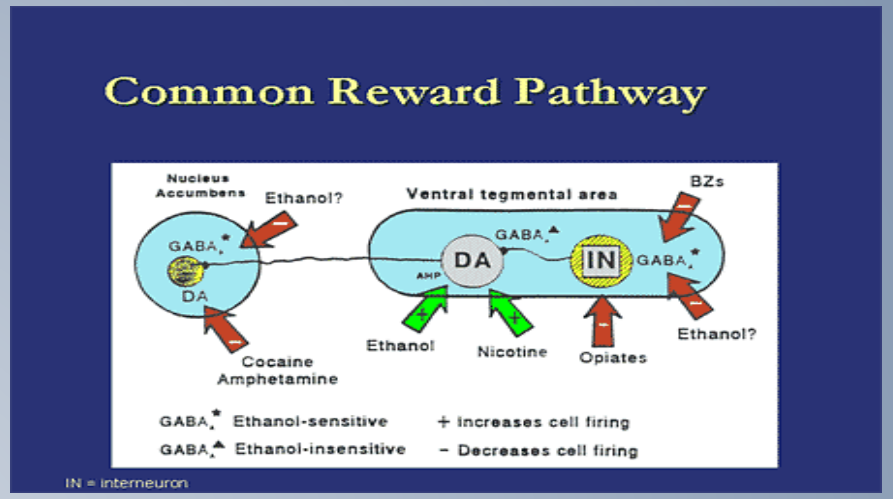
Opioids and Addiction



- Opioid drugs with abuse potential are agonists at the μ opioid receptor.
- This receptor is found in the brain, spinal cord, and intestinal tract.
- Acute activation of μ receptors leads to analgesia, mood changes including euphoria, sedation, meiosis, respiratory depression, and decreased gastrointestinal motility
- Opioid actions on the mesocorticolimbic **dopamine system.**
- Opioids facilitate dopamine release in the nucleus accumbens.

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Factors in Opioid Addiction

- As opioid dose was increased, the risk for addiction also increased
- The chronicity of treatment also was related to risk
  - Larger effect than the dose in determining risk.
- Since by definition, chronic pain treatment has no end-date, it represents a higher risk situation.
- Obtaining overlapping prescriptions from multiple providers and pharmacies.
- Taking high daily dosages of prescription pain relievers.
- Having mental illness or a history of alcohol or other substance abuse.
- Living in rural areas and having low income.

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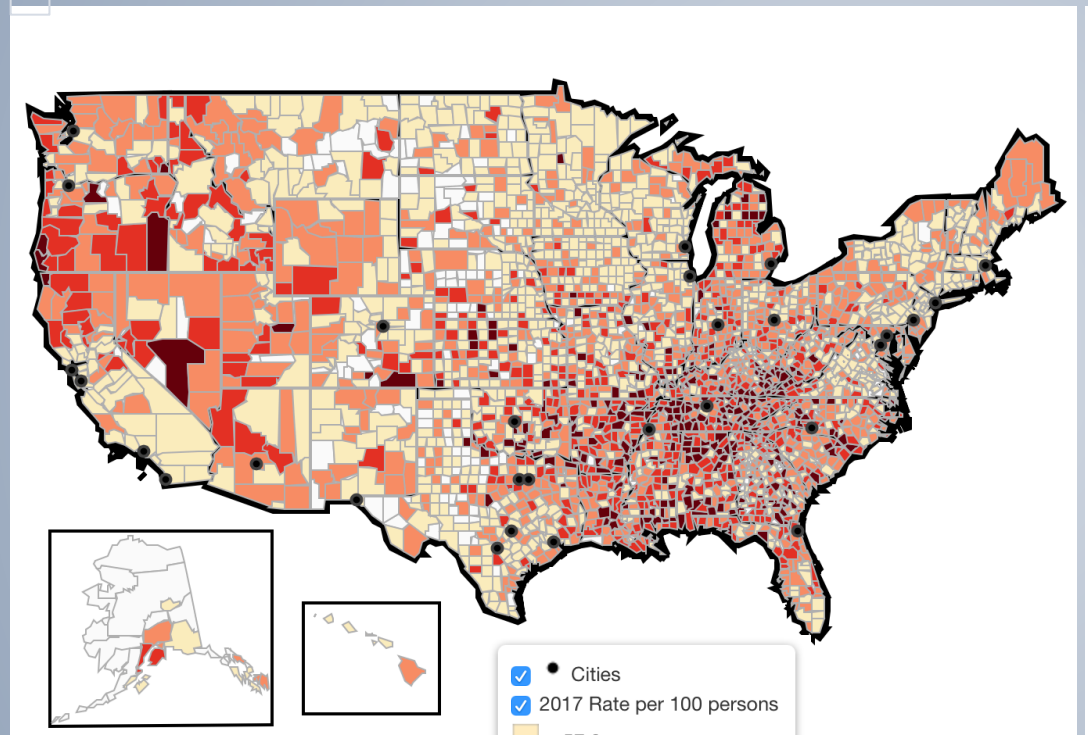
Rates of Opioid Prescriptions

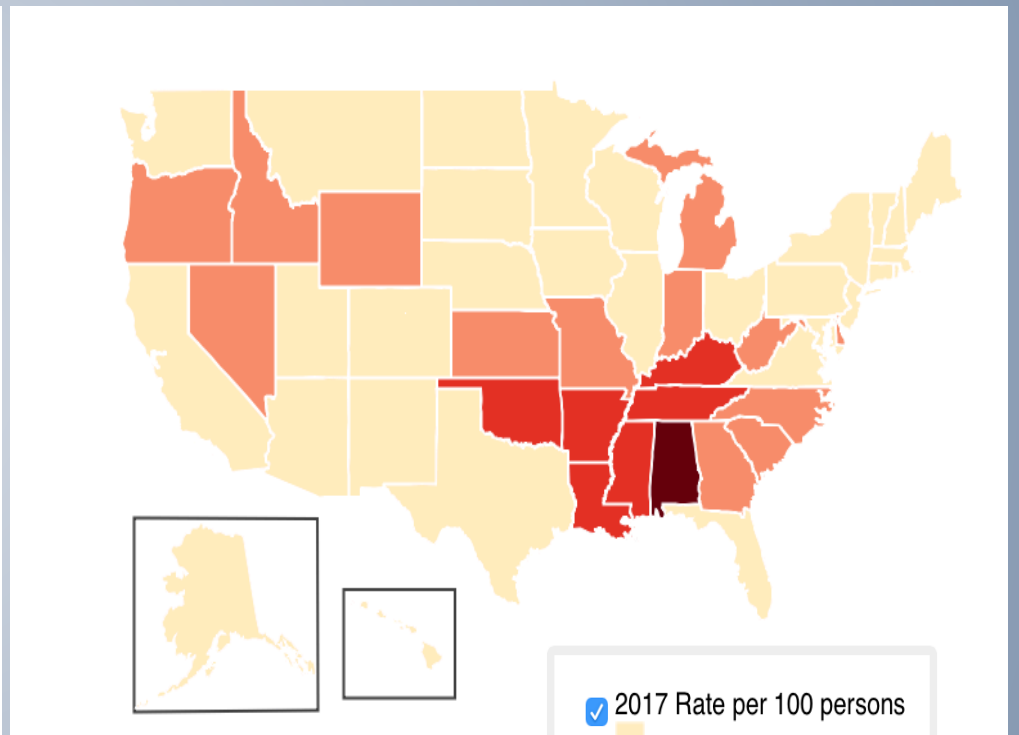
- Total number of prescriptions dispensed peaked in 2012.
- In 2017, the prescribing rate had fallen to the lowest it had been in more than 10 years
- However, in 2017, prescribing rates continue to remain very high in certain areas across the country.

Year	Total Number of Prescriptions	Prescribing Rate Per 100 Persons
2006	215,917,663	72.4
2007	228,543,773	75.9
2008	237,860,213	78.2
2009	243,738,090	79.5
2010	251,088,904	81.2
2011	252,167,963	80.9
2012	255,207,954	81.3
2013	247,090,443	78.1
2014	240,993,021	75.6
2015	226,819,924	70.6
2016	214,881,622	66.5
2017	191,218,272	58.7

https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html

Prescribing Rates for Opioids Across States & Counties.





https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html

Misuse vs Abuse

- **Drug misuse –** The use of prescription drugs without a prescription or in a manner other than as directed by a doctor, including use without a prescription of one's own; use in greater amounts, more often, or longer than told to take a drug; or use in any other way not directed by a doctor.
- **Drug abuse or addiction –** Dependence on a legal or illegal drug or medication.

https://www.cdc.gov/drugoverdose/prevention/index.html

Misuse vs. Abuse

Misuse:

Using legal drugs in the wrong way.

How?

- ✓ Taken more than prescribed
- ✓ Using without doctor knowing
- ✓ Using someone else's medicine

Abuse:

Using substances that are illegal & are not intended to be taken into the body.

Examples?

- ✓ Marijuana
- ✓ Cocaine
- ✓ Heroin
- ✓ Other

Clinical Implications

- **Prescription drug monitoring programs (PDMPs) –** State-run electronic databases that track controlled substance prescriptions. PDMPs help providers identify patients at risk of opioid misuse, abuse and/or overdose due to overlapping prescriptions, high dosages, or co-prescribing of opioids with benzodiazepines.
- **Extended-release/long-acting (ER/LA) opioids –** Slower-acting medication with a longer duration of pain-relieving action.

CURES 2.0

https://www.cdc.gov/drugoverdose/prevention/index.html

Opioid Tapering

50 MME/day:

- 50 mg of hydrocodone (10 tablets of hydrocodone/acetaminophen 5/300)
- 33 mg of oxycodone (~2 tablets of oxycodone sustained-release 15 mg)
- 12 mg of methadone (<3 tablets of methadone 5 mg)

- Patient requested a dose reduction
- Total daily dose of opioids exceeds 50 maximum morphine equivalent (MME) without benefit
- Patient using opioids in combination with benzodiazepines
- Inability to achieve or maintain anticipated pain relief or function improvement despite reasonable dose escalation
- Patient experiences overdose or other serious adverse event or shows early warning signs for overdose risk (e.g., confusion, sedation or slurred speech)
- Persistent non-adherence with opioid treatment agreement or showing signs of substance use
- Deterioration in physical, emotional or social functioning attributed to opioid therapy
- Resolution or healing of the painful condition

Centers for Disease Control and Prevention. Pocket Guide: Tapering Opioids for Chronic Pain. www.cdc.gov/drugoverdose/pdf/clinical_pocket_guide_tapering-a.pdf.

Withdrawal Symptoms

Opioid withdrawal is characterized by signs and symptoms of sympathetic stimulation, due to decreased sympathetic antagonism by opioids

- Anxiety
- Hypertension
- Tachycardia
- Restlessness
- Mydriasis
- Diaphoresis
- Tremor
- Piloerection
- Nausea
- Abdominal cramps
- Diarrhea
- Anorexia
- Dizziness
- Hot flashes
- Shivering
- Myalgias or arthralgias
- Rhinorrhea
- Sneezing
- Lacrimation
- Insomnia
- Dysphoria
- Yawning

Wesson DR, Ling W. The Clinical Opiate Withdrawal Scale (COWS). J Psychoactive Drugs. 2003;35(2):253-259. http://www.naabt.org/documents/COWS_induction_flow_sheet.pdf.

Opioid Tapering

- Decrease of 10 percent of the original dose per week. Some patients who have taken opioids for a long time might find even slower tapers easier. (CDC)
- Symptoms typically start 2-to-3 half-lives after the last opioid dose.
- Generally, opioid withdrawal is **not life-threatening** in patients who don't have significant comorbidities.
- Tapering Support
  - **Alpha Adrenegic Agonists:** Anecdotal evidence for clonidine or guanfacine
  - **Symptomatic Pain Treatments:** nonsteroidal anti-inflammatory drugs or acetaminophen.
  - **Other Medications:** medication to treat nausea and vomiting or diarrhea.
  - **Behavioral Health Support:** Psychosocial interventions may include cognitive behavioral therapy and interdisciplinary programs for chronic pain.

Centers for Disease Control and Prevention. Pocket Guide: Tapering Opioids for Chronic Pain. www.cdc.gov/drugoverdose/pdf/clinical_pocket_guide_tapering-a.pdf

Implications for the Healthcare Team

- **Non-opioid therapy –** Methods of managing chronic pain that does not involve opioids.
  - acetaminophen (Tylenol®) or ibuprofen (Advil®)
  - cognitive behavioral therapy
  - physical therapy and exercise
  - medications for depression or for seizures
  - interventional therapies (injections).
- **Non-pharmacologic therapy**
  - physical treatments (e.g., exercise therapy, weight loss)
  - behavioral treatments (e.g., cognitive behavioral therapy, meditation).

Combined acetaminophen, ibuprofen produces similar amount of pain relief as opioids in ED patients

Chang A, et al. *JAMA*. 2017;doi:10.1001/jama2017.16190.
Kyriacou DN. *JAMA*. Volume 318, Number 17, Pages 1655-1656.
November 7, 2017

ADD TOPIC TO EMAIL ALERTS

Andrew K. Chang

ED patients with acute extremity pain had neither clinically important nor statistically significant differences in pain reduction at 2 hours when receiving a single dose of ibuprofen and acetaminophen or several different combinations of opioids and acetaminophen, according to findings recently published in *JAMA*.

https://www.cdc.gov/drugoverdose/prevention/index.html

Proposed Solutions

- More than 125 million Americans suffering from either acute or chronic pain
- A huge need for the development of effective alternatives to opioids
- Enabled at least in part by a fuller understanding of the neurobiological bases of pain
- Best long-term solution for controlling and ultimately eradicating this epidemic
- Lower Dose Prescribing
- Decreased duration of treatment

Cold And Heat

- For certain types of injuries, the use of cold or heat may help dissipate pain.
- Not a large amount of scientific data to support the use of cold and heat but a helpful complement to other treatments.
- Cold, in particular, can be useful in the hours right after an injury.
  - Pain relief, decrease inflammation and muscle spasms and may help speed recovery.
- Heat may be useful for other types of injuries.
  - Raise pain thresholds and decrease muscle spasms in people suffering from osteoarthritis, useful for treating tendinitis early on, and may reduce back pain and disability.

Harvard.edu/blog/special-reports/pain-relief-natural-and-alternative-remedies-without-drugs-or-surgery

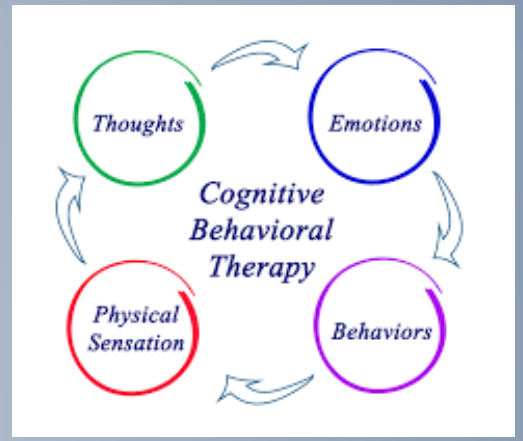
Exercise

- Helpful in common conditions: low back pain,arthritis, and fibromyalgia.
- Vicious cycle in which pain inhibits people from exercising for fear of causing more pain.
- Lack of exercise causes muscles to lose strength, making it even more painful and difficult to exercise.
- Staying physically active, despite some pain, can prevent that vicious cycle from starting—or at least keep it from accelerating.
- Physical activity also combats obesity, which is a risk factor for a variety of painful health conditions
- Physical activity releases endorphins, which can improve your mood

Harvard.edu/blog/special-reports/pain-relief-natural-and-alternative- remedies-without-drugs-or-surgery

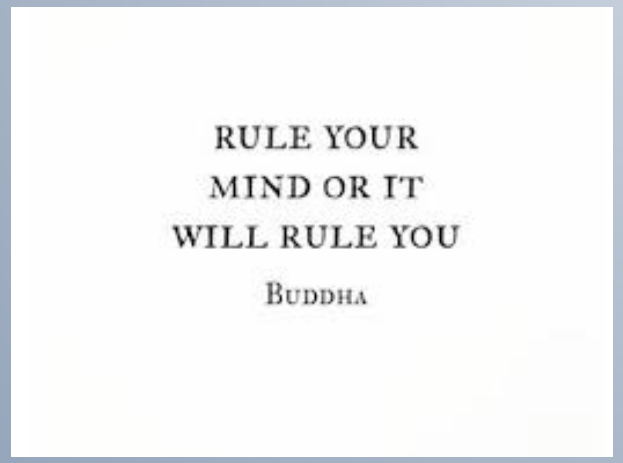
Mind-Body Techniques

- Mind-body relaxation techniques have become well accepted as stress-reducing strategies. Help pain 2 ways:
- First, chronic pain conditions can rob people of a sense of control over their bodies and, thus, their lives. (CBT gives control)
- Second, they can help turn off what is known as the fight- or-flight response or the stress response.
- Cognitive behavioral therapy (CBT) is a form of psychotherapy that seeks to break counterproductive thought and behavior patterns that may worsen pain.
- Relaxation techniques emphasize a strong connection between the mind and the body and can calm revved-up muscle, metabolic, and hormonal responses.



Mindfulness

- Mindfulness meditation is another approach combining elements of relaxation and hypnotherapy, which seeks to increase focused attention and facilitate relaxation.
- Based in Theravada Buddhism, it seeks to increase intentional self- regulation to what is occurring in the present without attaching negative associations.
- As applied to pain management, a primary goal is to separate the pain sensation from unhelpful thoughts.



Is Marijuana Better Than Opioids?

- Medical marijuana may offer an alternative to addictive opioids.
- When researchers surveyed almost 3,000 medical cannabis users, they found that 30 percent had used opioids in the last 6 months.
- Of those respondents, 81 percent agreed or strongly agreed that marijuana was more effective alone than in combination with opioids.
- In addition, 97 percent said they agreed or strongly agreed that they could decrease their opioid usage when taking marijuana.

Marijuana For Pain Management

- Most marijuana-based products do not have approval from the United States Food and Drug Administration (FDA), and more evidence is necessary to confirm their safety and effectiveness.
- The different types of marijuana plants include the following:
  - *Cannabis indica (body)*
  - *Cannabis sativa (euphoria)*
  - hybrids
- There is limited research available on the use of specific marijuana strains for pain and other symptoms.
- Strain-specific recommendations are not medically proven.

Reiman, A., Welty, M., & Solomon, P. (2017, June 1). Cannabis as a substitute for opioid-based pain medication: Patient self-report. *Cannabis and Cannabinoid Research*, *2*(1), 160–166.

Thank You!

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