# The Psychology of Pain

*With Considerations and Implications for Cancer Pain and Opioid Prescribing*

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  - *The content represented in this presentation is solely my responsibility and does not necessarily represent the official views of the National Institutes of Health*
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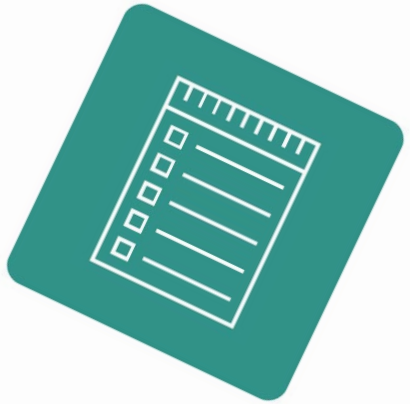
# Agenda

- Review general chronic pain prevalence, mechanisms, and models
  - Contrast biopsychosocial and biomedical models
- Review application of biopsychosocial model to cancer pain
- Review patient perspectives on opioid therapy and nonpharmacological pain interventions
- Review treatment implications

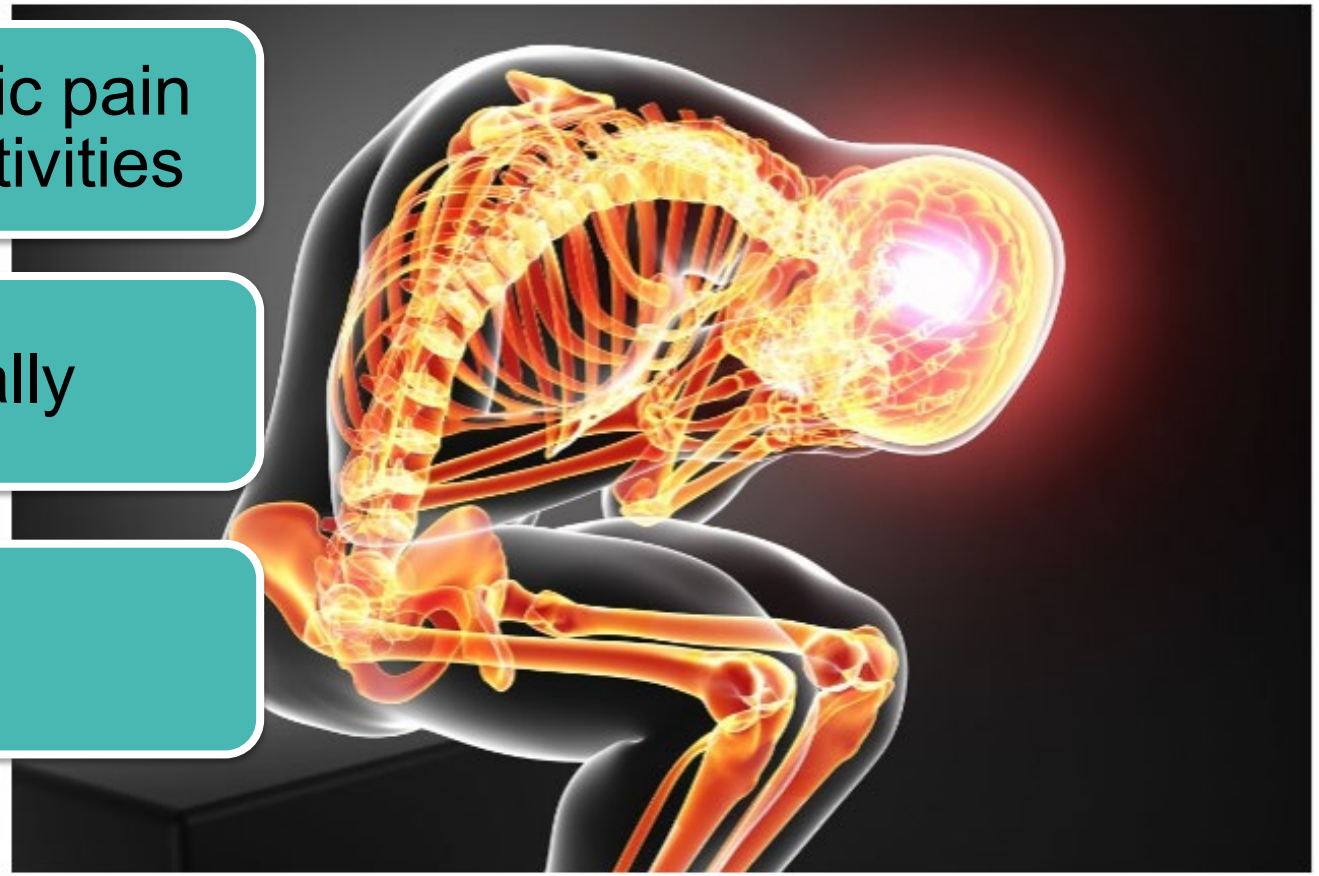


Chronic pain affects over 50 million American adults (about 1 in 5)

19 million have high-impact chronic pain that substantially restricts daily activities

Costs >$560 to $635 billion annually

Chronic cancer pain is increasing



VCU Health

Yong et al., 2022; Rikard et al., 2023; Smith & Hillner, 2019, Torre et al., 2016

Associated with significant negative impacts on mental health and sleep

Linked to poorer social/family functioning and negative effects on employment status

Found to negatively impact QOL more than other medical conditions

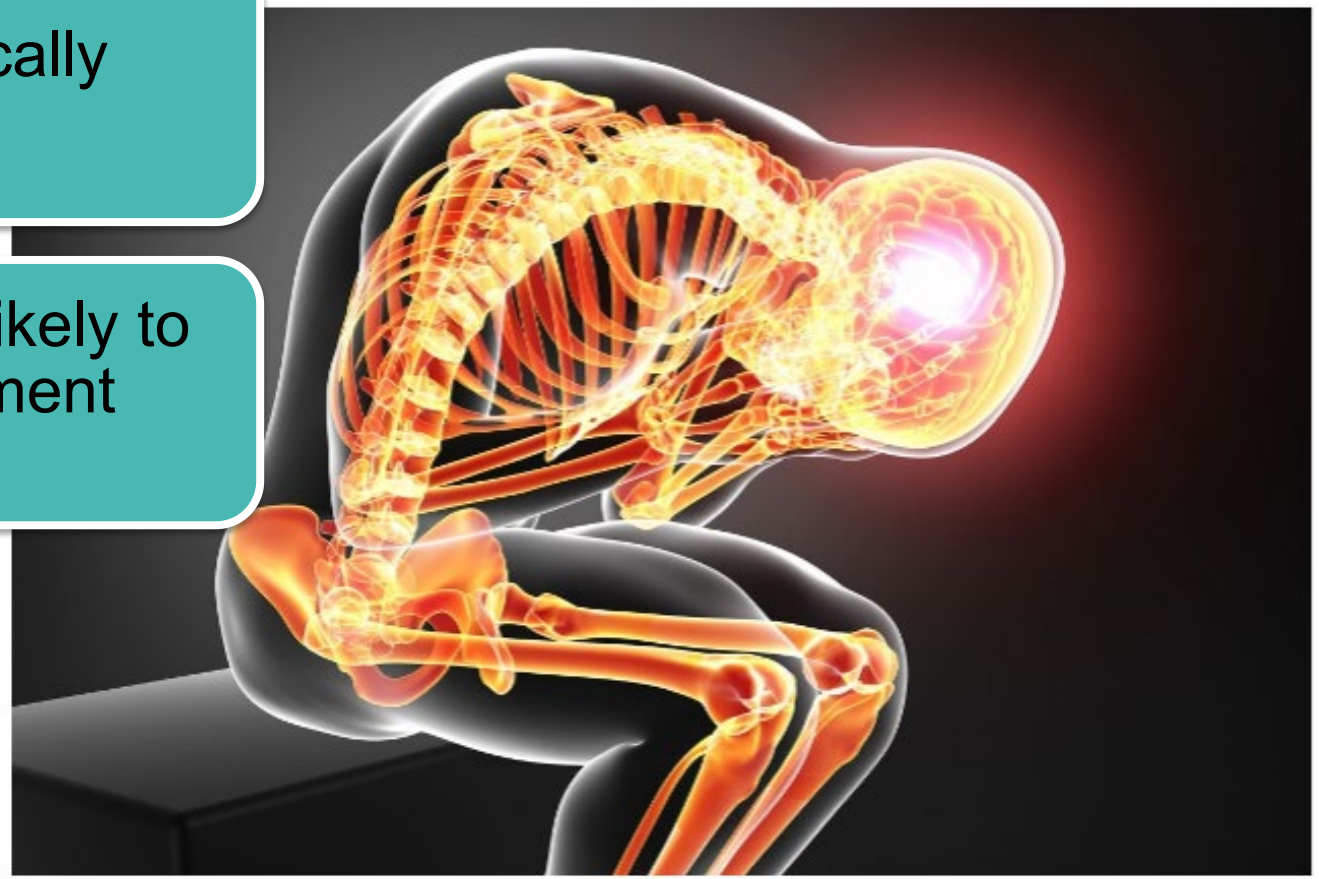
VCU Health

Dueñas et al., 2016; McCarberg et al., 2018; Loyland et al., 2016

Higher prevalence among women, individuals from lower SES, military veterans, and people residing in rural areas

Greater burden on racially and ethnically minoritized individuals

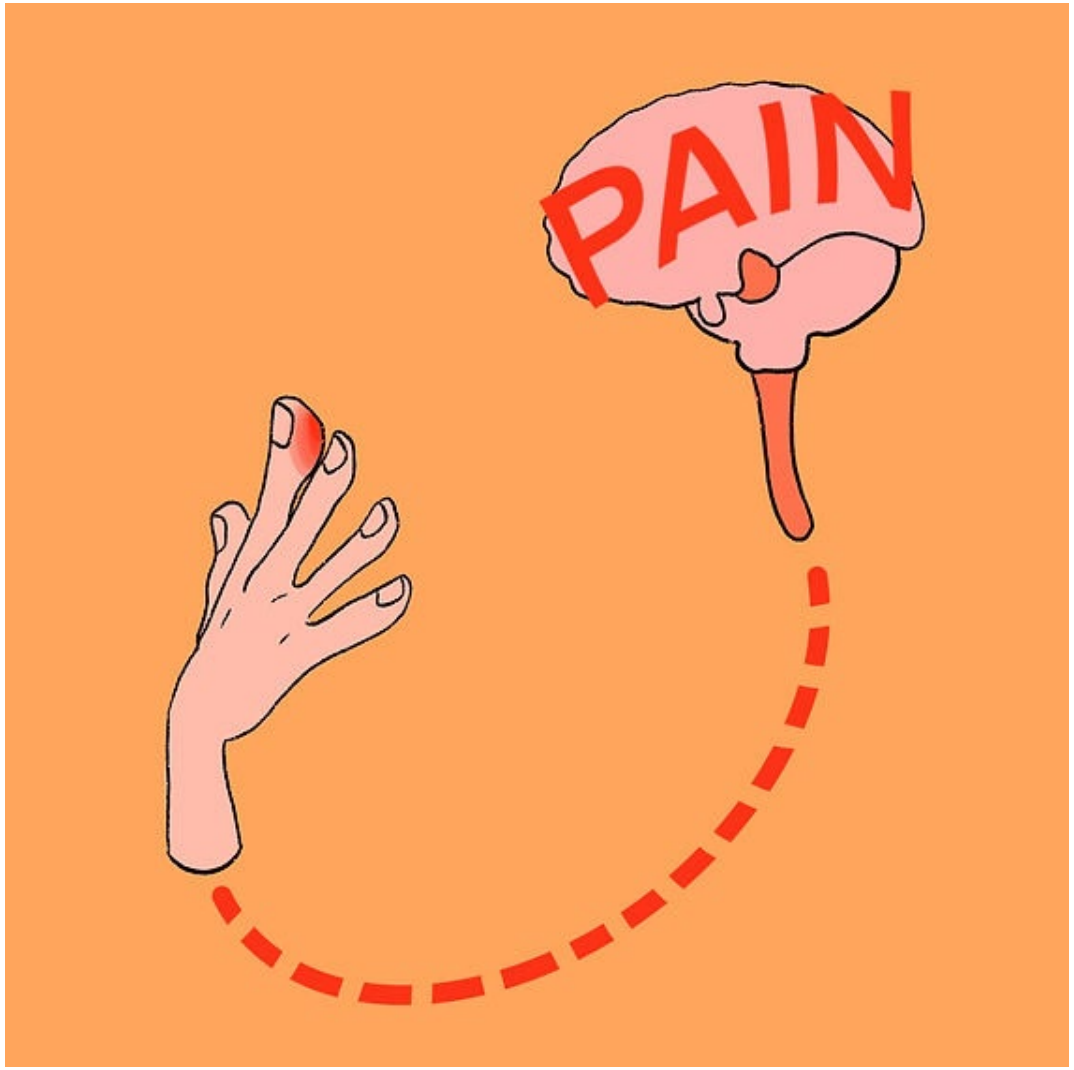
Racially minoritized individuals less likely to receive comprehensive pain assessment and treatment options



VCU Health

Dalhamer et al., 2018; Meints et al., 2019; Yang et al., 2022; Meghani et al., 2012

# How we feel pain & why it doesn't always get better




Acute Pain

≠

Chronic Pain

# Hurt does not equal harm

- Damage does not necessarily predict pain, and pain does not necessarily indicate damage

## MRI Spine Imaging Findings In People With No Back Pain

| | Age, n=3300 | | | | | | |
|---|---|---|---|---|---|---|---|
| **IMAGING FINDING** | **20** | **30** | **40** | **50** | **60** | **70** | **80** |
| DISK DEGENERATION | 37% | 52% | 68% | 80% | 88% | 93% | 96% |
| DISK BULGE | 30% | 40% | 50% | 60% | 69% | 77% | 84% |
| DISK PROTRUSION | 29% | 31% | 33% | 36% | 38% | 40% | 43% |
| ANNULAR FISSURE | 19% | 20% | 22% | 23% | 25% | 27% | 29% |
| FACET DEGENERATION | 4% | 9% | 18% | 32% | 50% | 69% | 83% |
| SPONDYLOLISTHESIS | 3% | 5% | 8% | 14% | 23% | 35% | 50% |

Brinjiki W, et. al. Am J Neuroradiol. 2015, 36:811-6

# Biopsychosocial Model

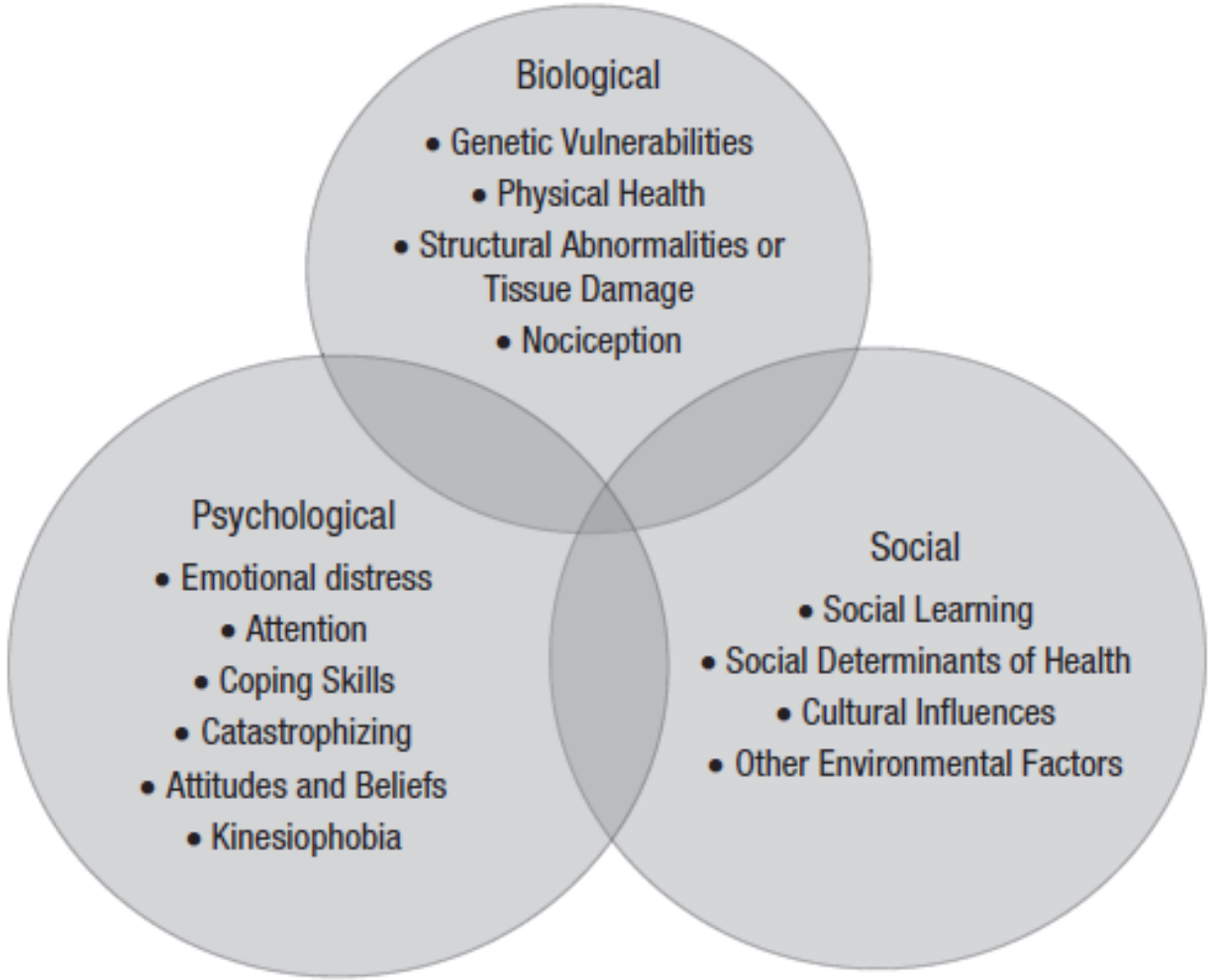
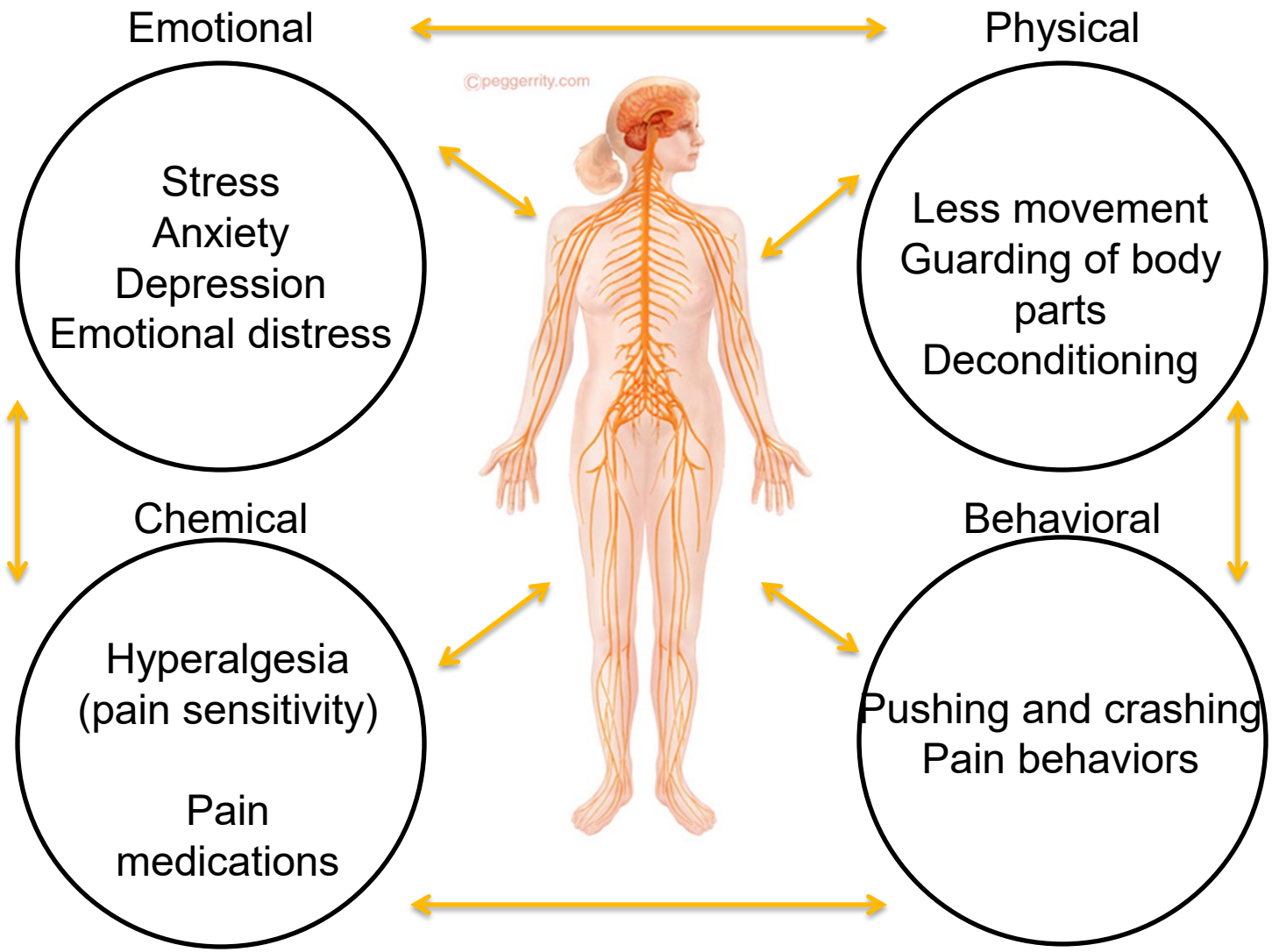



**Fig. 1.** Biopsychosocial model of chronic pain (based on the work of Engel, 1978).

# Reactive and Maintaining Factors



# Biomedical Model


Descartes Cartesian model of pain

- → Overuse of tests
- → Belief that if there is no observable organic damage, there is no “real” pain
- → Split between physical and emotional experiences / mind & body
- → Underemphasis on the complexity of human experience

# Biopsychosocial Contributors to Pain in Cancer

## Biological

- Treatment-induced, e.g., Chemotherapy-induced peripheral neuropathy; Radiation fibrosis and scarring, post-surgical pain
- Tumor invading nearby nerves, organs, or tissues
- Bone metastases and skeletal-related events

## Psychological

- Fear of recurrence
- Mood changes, grief
- Trauma-related factors

## Social

- Role and identity changes
- Cultural factors
- Treatment by healthcare providers and family/friends

# Pain as an Output of Prediction, Not Just Input

- Predictive processing
- Maladaptive interoception
- Hypervigilance and salience tagging

# Advances in chronic pain treatment broadly

- Growing understanding of the neurobiology and biopsychosocial nature of chronic pain
- Treatment developments
  - Psychological interventions
  - Other nonpharmacological approaches
  - Interdisciplinary approaches
  - Interventional techniques
  - Pharmacological / non-opioid medications
- Areas of continuing investigation
  - Gene therapy, regenerative medicine, psychedelics, scrambler therapy

- Development of patient-centered opioid tapering programs
  - Application of buprenorphine for pain

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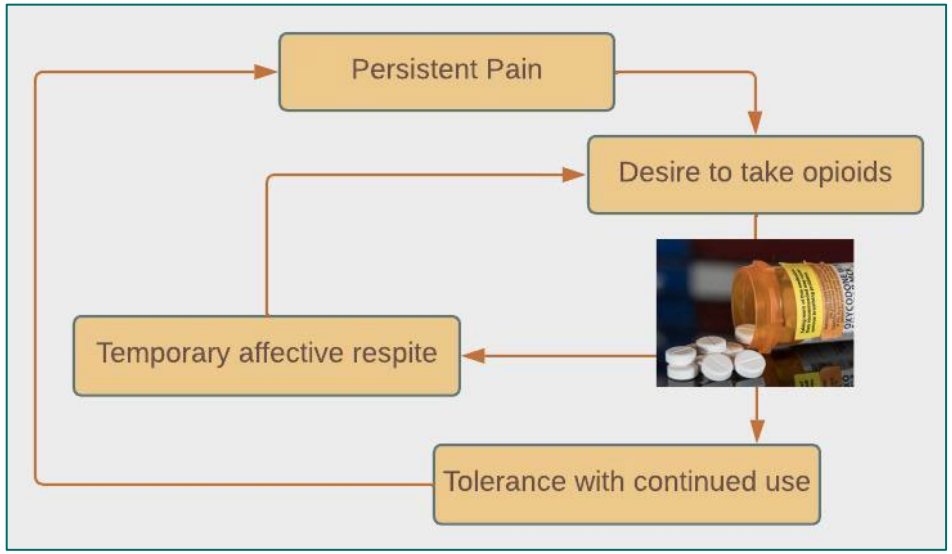
Koes et al., 2018; Cohen et al., 2021

# Cancer Survivors with Chronic Pain

- Growing population
- Challenges
  - Differences vs similarities to other chronic pain populations
    - Risk for centralization of pain & predictive conditioning?
  - More patients transitioning from acute to chronic use of opioids
  - Under-utilization of other evidence-based chronic pain treatments






Tonorezos et al., 2024; Paice et al., 2014; van den Beuken et al., 2007

# Patient concerns & perspectives (*N*=157)

% reporting at least some level of concern about opioid medications: **79.6**

| Concerns regarding Opioid Medications | n (%) Endorsing as Concern |
|---|---|
| Tolerance | 84 (53.5%) |
| Doctors may become unwilling to prescribe in the future | 74 (47.1%) |
| Relying on medication long-term | 70 (44.6%) |
| Addiction/dependence | 66 (42.0%) |
| Lack of effectiveness (continued pain) | 66 (42.0%) |
| Judgement, stigma, concern | 45 (28.7%) |
| Side effects | 43 (27.4%) |
| Medication masking “real problem” | 36 (22.9%) |
| Interference with daily functioning | 24 (15.3%) |
| Interference with mood | 23 (14.6%) |
| Negative effects on professional job/life/career | 15 (9.6%) |
| Moral concerns | 8 (5.1%) |
| Other concerns | 11 (7.0%) |

# Patient concerns & perspectives

% above threshold for misuse / OUD risk on the Prescription Opioid Misuse Index: **23.6**

| Side Effect from Opioid Medication | n (%) Endorsing |
|---|---|
| Constipation | 89 (56.7%) |
| Fatigue / tiredness / sedation | 72 (45.9%) |
| Physical dependence / withdrawal symptoms | 50 (31.8%) |
| Itching | 35 (22.3%) |
| Nausea | 31 (19.7%) |
| Sweating | 31 (19.7%) |
| Dizziness | 27 (17.2%) |
| Headaches | 24 (15.3%) |
| Vomiting | 15 (9.6%) |

% reporting at least one side effect from opioids: **89.8%**

# Clinical and functional outcomes

| | |
|---|---|
| Average pain severity (0-10): 5.83 (*SD*=1.63) | Brief Pain Inventory |
| Average pain interference (0-10): 6.24 (*SD*=1.99) | Brief Pain Inventory |
| Moderate, severe, or extreme central sensititization symptoms: 66.9% | Central Sensitization Inventory |
| Above threshold for depression: 72.6% | CES-D |
| Above threshold for anxiety: 61.1% | GAD-7 |

# Patient concerns & perspectives

**Biggest barrier (if only could pick one):**
Fear of increased pain (**43.3%**)
Lack of alternative treatment options (**22.9%**)

| Barriers to Discontinuing Opioids | n (%) Endorsing as a Barrier |
|---|---|
| Lack of alternative treatments for my pain | 125 (79.6%) |
| Fear of increased pain | 124 (79.0%) |
| Concern that my functioning will decline | 88 (56.1%) |
| Concern that my mood or quality of life will be affected | 74 (47.1%) |
| I believe other treatments will not be as effective | 72 (45.9%) |
| Fear of withdrawal symptoms | 56 (35.7%) |
| The medication helps with things other than pain, e.g., sleep, anxiety, depression | 37 (23.6%) |
| Lack of interest of need, I don't have any reason to stop or decrease | 29 (18.5%) |
| Lack of support from my doctor(s) | 22 (14.0%) |
| Other barrier not listed | 19 (12.1%) |

# Cancer Survivors on Long-Term Opioids: Lived Experience

- Conducted two focus groups here at VCU with adult patients with a history of cancer on long-term opioid therapy for continued pain (*N*=10)
- Focus groups transcribed, analyzed and coded using rapid qualitative analysis

| Patient Demographics | |
|---|---|
| Focus Group 1 (*N*=5) | Focus Group 2 (*N*=5) |
| •5 White or Caucasian<br>•5 Males<br>•Age Range: 25-58 | •3 White or Caucasian, 2 Black or African American<br>•4 Females, 1 Male<br>•Age Range: 42-67 |

# Cancer Survivors on Long-Term Opioids: Utilization of non-pharmacological chronic pain interventions

- Five (out of 10) shared they have tried various non-pharmacological strategies
- Massage, relaxation, heat, breathing techniques, chiropractics, acupuncture, music therapy
- Primarily shared positives experiences but one reported nothing has helped and can even make pain worse

> *"The treatments that I attempted… brought me a little bit of peace of mind and helped me cope with what's happening a little better than I was"*
>
> *"The music [therapy]… helped ease my anxiety, which in turn helped a little with pain control"*

# Cancer Survivors on Long-Term Opioids: Pros and cons of opioids

- All shared both pros and cons of opioids
- Cons: side effects (constipation, fatigue), tolerance, stigma, "fighting addiction," fear of addiction, safety concerns, back and forth to find right regimen, going to the doctor every month
- Pros: can be effective once the right medication and dosing is found; some acknowledgement that opioids also help with coping
  - *"Not even doctors can really understand… what cancer pain is about… In particular, nothing really takes that pain away…You could take all the opioids you want, and the pain is a constant…But what the drugs will do, just allow you to cope with the pain more. It doesn't really take the pain away… The pain is still there, but you're able to cope with it some. Or you're able to, you know, go to sleep a little easier."*
- Two participants shared about addiction history (one pre-existing, one that started with opioids for cancer pain) which has created challenges and concerns with taking opioids

  *"You have to fight it all the time.. You constantly want to take more than you're allotted."* With prior cancer history: *"The cancer was cured and the pain from that cancer went away, except… my brain told me I still had pain and needed the drugs… eventually I stopped taking them and realized I didn't need to be taking them all that time."* (now back on for cancer recurrence)

# Cancer Survivors on Long-Term Opioids: Barriers & facilitating factors to seeking non-opioid treatments

- Generally agreed they are interested and willing to try other treatments if they help
- Barriers: cost, insurance coverage, availability of providers, travel distance, not learning about alternatives from their team, medical staff not having time to cover or provide other treatments or education about alternatives, concern about bringing up alternative treatments to their providers
  - *-"I'm kind of leery on asking questions… like I said before, you don't want them thinking you're seeking something. Even if you're thinking about different arrangements."*
  - *-"Once the medication was working well, and I gave that feedback, then that was it… there were no other discussions about, what alternatives should we try with her? It was just, she's on something that works. Let's just let it be. That's the impression that I was under."*
  - *Many physicians don't mention all of the options available as far as pain control… they get to the oxycodone or MS Contin and they say 'that's it, that's all I can offer.' There are tons of options available but they are not mentioned. Many physicians need to be educated on those."*
- Facilitating factors: medication treatment not working well enough, help with stress/anxiety, finding benefit in particular approaches (nutrition, exercise, music therapy)

# Cancer Survivors on Long-Term Opioids: Stigma

- Overall significant agreement that stigma is a concern and a challenge; Noted that the opioid epidemic has led to more "suspicion," questioning
- Shared about stigma from healthcare providers, particularly at the pharmacy and in emergency room, and from family and friends. Much discussion about being seen as "drug seeking." Stories about being accused of misusing meds, pharmacy refusing to refill prescriptions or "making excuses"
  - *"It seems like the pharmacy tech has finally found somebody to pounce on, and you're that person… there's nothing you can do, because if you become angry, or if you raise your voice, or, God forbid! Become belligerent, you're labeled. Immediately. You're labeled as an out-of-control person simply because of your prescription."*
- Some discussion about cancer diagnosis reducing stigma
  - *"They kind of give me a look like I'm just a drug seeker and trying to…get high. They pull up a note in my chart that says I have cancer, and that kind of changes. Their whole perspective on it."*
- Reported stigma has impacted medical care – dosing of meds, which pharmacy they go to, what they are willing to say/ask of providers

# Cancer Survivors on Long-Term Opioids: Pain memories and cancer being different

- Participants emphasized distinction between cancer pain and other pain; provided descriptions of their pain and how most people don't understand what it's like to live with cancer pain
- Several shared about memories of severe pain related to cancer
  - One shared about how she was "absolutely miserable" with "unimaginable" pain" prior to finding right treatment; another shared memory of being at the hospital with "uncontrollable pain"

…*how might this impact chronification of pain and approach to treatment?*

# Clinical Implications

- Prevention
  - Education, reduce perceived threat of pain
- Consider psychological factors in pain assessment and management
  - Mood, support, health behaviors
- Treatments:
  - Pain neuroscience education
  - Movement exposure
  - Psychological treatments like CBT and ACT

# Evidence-based psychological interventions for cancer pain

- Multiple meta-analyses have demonstrated positive effects of psychosocial interventions on cancer pain, with mostly medium effect sizes

- Best evidence for:
  - Cognitive Behavioral Therapy
  - Acceptance and Commitment Therapy
  - Mindfulness-based interventions
  - Hypnosis

- Treatments aim to address:
  - Emotional distress, coping, quality of life, functioning

# Thank You!
# Questions?

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