Acute and Chronic Pain Management

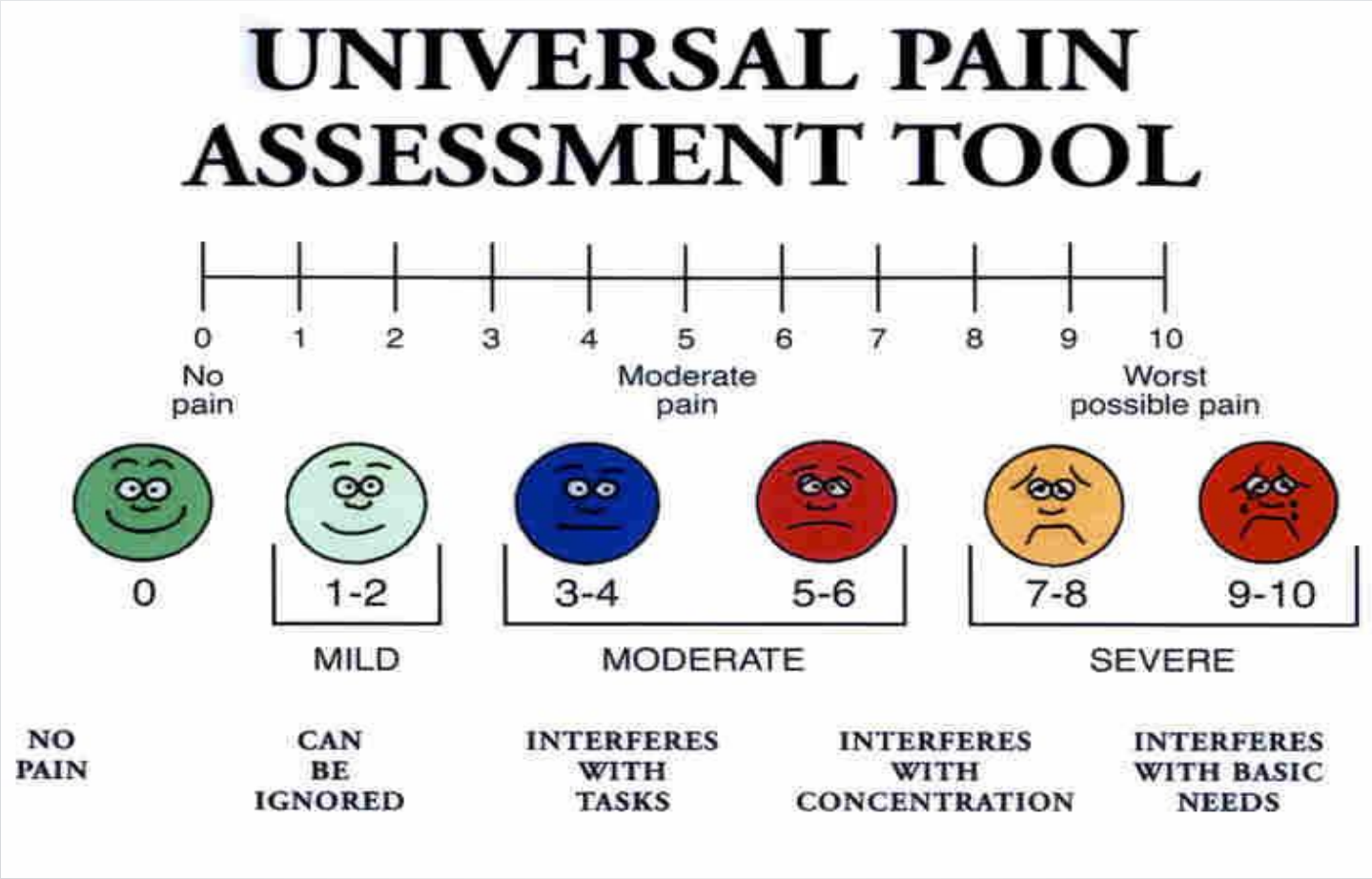
Meredith Mucha, MD, FACP

OhioHealth Geriatrics

Factors Contributing to Pain in the Elderly

Pain is a multidimensional experience

PAIN ASSESSMENT



Acute and Chronic Pain Management

Allodynia	Perception of an ordinarily non-noxious stimulus as pain
Analgesia	Absence of pain perception
Anesthesia	Absence of all sensation
Neuralgia	Pain in the distribution of a nerve or a group of nerves
Paresthesia	Abnormal sensation perceived without an apparent stimulus
Hypoalgesia	Diminished response to noxious stimulation (eg, pinprick)
Hyperalgesia	Increased response to noxious stimulation
Hyperesthesia	Increased response to mild stimulation

TYPES OF PAIN

Pain classifications depend on the following: QRTPS

a. Inferred pathophysiology (nociceptive vs. non-nociceptive)

b. Time course (acute vs. subacute vs. chronic)

c. Location (localized painful region vs. generalized)

d. Etiology (e.g., cancer, arthritis, nerve injury or a combination of these)

TYPES OF PAIN

Nociceptive Pain: tissue/inflammation, such as sprains, bone fractures, burns, bruises, localized, constant effect with activity

Somatic and visceral

Visceral pain:

- Internal organ or its covering (eg, parietal pleura, pericardium, or peritoneum)

Somatic pain:

- Superficial: skin, subcutaneous tissues, and mucous membranes. Sharp, prickling, throbbing, or burning sensation, well-localized
- Deep: muscles, tendons, joints, or bones. Dull, aching quality, less well localized

TYPES OF PAIN

Non-nociceptive Pain

a. Neuropathic Pain: (nerve damage or entrapment such as shingles, neuralgia, phantom limb pain, carpal tunnel syndrome, peripheral neuropathy), follows nerve distribution, episodic/lacerating/numbess/tingling

b. Central or **Nociplastic:** "coming from the brain", CNS and systemic problems, widespread, sleep/fatigue/memory/mood disturbance (Fibromyalgia/Irritable Bowel Syndrome/tension headaches/Chronic Fatigue Syndrome

-not as responsive to NSAIDS/Opioids/Surgery

TX FOR TYPES OF PAIN

Nociceptive

- NSAIDS (topical, oral)
- Tylenol
- Duloxetine (low back OA)
- Muscle relaxants
- Opioids (2^{nd} or 3^{rd} line)

Neuropathic

- SNRIs, TCAs
- Gabapentinoids
- Topical lidocaine
- Opioids (2^{nd} or 3^{rd} line)

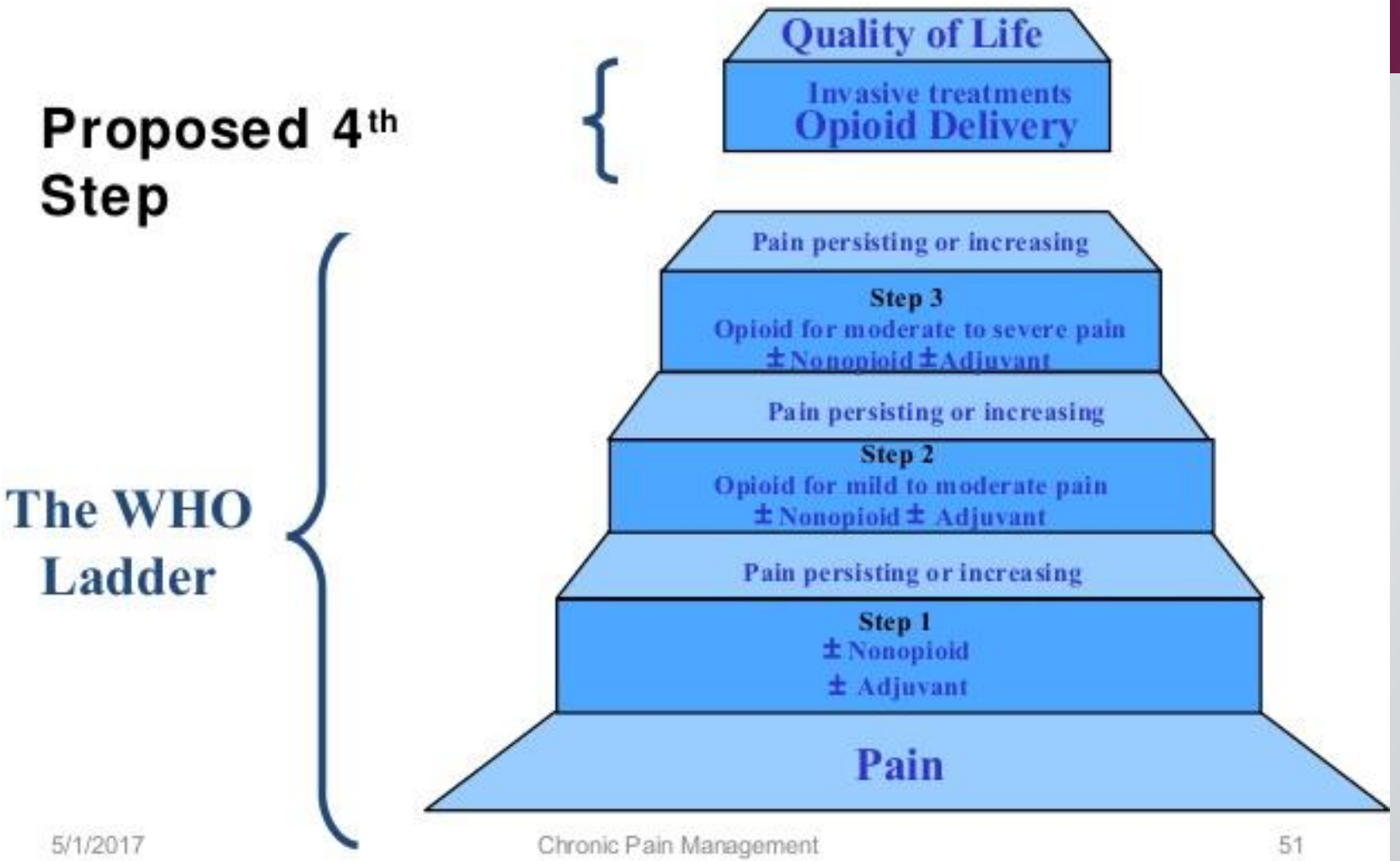
Nociplastic

- SNRIs/TCAs
- Gabapentinoids
- ***Opioids avoided***

NON-PHARMACOLOGICAL TX

- Guided imagery
- Mind and body medicine
- Ayurveda
- Meditation
- Rasayana
- Nutrition and dietary services
- Aromatherapy
- Exercise
- Yoga
- Cognitive Behavioral Therapy
- Therapeutic massage
- Acupuncture
- Spinal Manipulation
- Reiki

Modified WHO Analgesic Ladder



PAIN LADDER

- WHO three-step analgesic ladder presents a stepped approach based on pain severity. If the pain is mild, begin with Step 1. This involves the use of analgesics such as acetaminophen or an NSAID, while keeping in mind potential renal and gastrointestinal adverse effects (JNCI, 2013).
- If pain persists or worsens despite appropriate dose increases, a change to a Step 2 or Step 3 analgesic is indicated. At each step, an adjuvant drug or integrative modality may be considered in selected patients.
- In general, analgesics should be given "**by mouth, by the clock, by the ladder, and for the individual**" and should include regular scheduling of the analgesic, not just on as-needed basis.

Acute and Chronic Pain Management: Pharmacologic Management

- Acetaminophen
- Cyclooxygenase (COX) inhibitors
- Antidepressants
- Neuroleptic agents
- Antispasmodics and muscle relaxants
- Anticonvulsants
- Corticosteroids
- Bisphosphonates
- Medical marijuana
- Systemic administration of local anesthetics
- Tramadol
- Opioids

TOPICAL

- NSAIDS
- Salicylates (topical surface effect from rubbing)
- Lidocaine
- Capsaicin
- Methadone
- CBD (cannabidiol)
- Steroids
- Ketamine and amitriptyline

Acute and Chronic Pain Management

Acetaminophen

Oral analgesic, antipyretic agent that is also available as an intravenous preparation (Ofirmev).

Inhibits prostaglandin synthesis but lacks significant anti-inflammatory activity.

Hepatotoxic at high doses. The recommended adult maximum daily limit is 3000 mg/d, reduced from a previously recommended limit of 4000 mg/d.

Acute and Chronic Pain Management

Nonsteroidal Anti-inflammatory Drugs (NSAIDs)

Inhibit prostaglandin synthesis by inhibiting COX activity: analgesic, antipyretic, and anti-inflammatory

(a) COX-1 is found throughout body tissues, with functions including promotion of gastric mucus production, which protects the stomach lining, and stimulation of thromboxane A_2 production in platelets, which induces platelet aggregation

(b) COX-2 is induced primarily with inflammation. Selective COX-2 inhibitors, such as celecoxib, have a lower risk of peptic ulceration but are associated with an increased risk of thrombotic events, including myocardial infarction

Acute and Chronic Pain Management

- **Key Points About Traditional NSAIDs**
- NSAIDS: if patient is eating (recommend to avoid if *not* eating), mobile, normal GFR, steady Cr, and has PPI. Consider:
    - COX-2 (Mobic 7.5-15mg PO daily)
    - Naproxen 250mg po q 6 hours, max 1500mg /daily
- Judiciously with co-morbid conditions and elderly
- Can increase CV risk related to COX-2 inhibition
- 2015 FDA NSAIDs increase chance of MI or CVA, may inhibit anti-platelet effects of ASA

ADJUVANTS

- Enhance analgesic efficacy, treat concurrent symptoms, or provide independent analgesia for specific types of pain.
- Adverse drug reactions are common, however, and there are wide individual and ethnic differences in drug metabolism
- Not all analgesic agents have been shown to provide clinical benefit when used in conjunction with opioids.

Acute and Chronic Pain Management

Antispasmodics & Muscle Relaxants

- Musculoskeletal pain associated with spasm or contractures
- Tizanidine (Zanaflex) is a centrally acting α_2-adrenergic agonist used in the treatment of muscle spasm in conditions such as multiple sclerosis, low back pain, and spastic diplegia.
- Cyclobenzaprine (Flexeril) also may be effective for these conditions. Chemically similar to TCAs
- Baclofen (Gablofen, Lioresal), a $GABA_B$ agonist, is particularly effective in the treatment of muscle spasm associated with multiple sclerosis or spinal cord injury
  - Abrupt discontinuation of this medication has been associated with fever, altered mental status, pronounced muscle spasticity or rigidity, rhabdomyolysis, and death.
  - Side effects: weakness, sedation, dizziness

GABAPENTINOIDS

- Gabapentin (CNS side effects >3600mg daily)
- Pregabalin (structurally similar to Gabapentin), higher potency and absorption
- Anti-epileptic, analgesic, sedative
- Schedule V (risk of abuse low)
- FDA approvals: Gabapentin (PHN), Pregabalin (PHN, DPN, fibromyalgia, neuropathic pain secondary to spinal injury)
- must start low in the elderly due to confusion!
  - 100mg po qhs for 3 days, then 100mg po TID. Renal dose adjustment. Switch to pregabalin if gabapentin was effective but side effects of confusion or edema were too burdensome.

NEUROPATHIC AGENTS

Gabapentin (Neurontin) and pregalbin (Lyrica)

Gabapentin and Pregabalin

AKA: pregabs, gaba-p

About: used for anxiety, neuropathic pain, and anticonvulsant. Pregabalin is a more potent successor to gabapentin

Popularity not monitored by BCS; five-fold increase in Pregab prescribing in five yrs

Method of Use: swallowed; prescribed dose range 100-600mg

Duration: 6 hrs+

Cost: 50p - £1 for a couple on streets

Source: prescribed, internet, street

Indicators: drowsy, slow reactions, calm

Effects: +ve: reduction in neural pain; relaxed muscles, drowsiness, reduction in anxiety, sense of calm, wellbeing

Risks: dependency, overdose (espec. If mixed with alcohol); Acute withdrawal

As benzos and other drugs have become more closely regulated, the prescription substance of choice for those seeking mental cushioning with pain relief is Gabapentin or pregabalin. They have become one of the sought-after drugs in prison and other settings.
On its own a relatively safe drug with a low OD risk. When combined with alcohol or opiates, the risk of OD increases. Tolerance and dependency can develop.

	Gabapentin (117,128)	Pregabalin (34,129)
Time to maximal absorption	2 h to 3 h	0.8 h to 1.4 h
Oral bioavailability	57% after single 300 mg dose, 42% after single 600 mg dose	>90% independent of dose
Metabolism and elimination	• Negligible metabolism • Renally excreted unchanged • Elimination half-life 5 h to 9 h	• Negligible metabolism • Renally excreted unchanged • Elimination half-life 4 h to 7 h
Drug interactions	• Oral antacids reduce bioavailability by 20% to 30%	• No significant drug interactions described to date
Starting dose	• 100 mg/day to 900 mg/day • Dose reduction required with renal insufficiency	• 75 mg/day to 150 mg/day • Dose reduction required with renal insufficiency
Titration	• Titrate toward MTD over several weeks • Increaseweekly by 300 mg/day to 900 mg/day	• Titrate toward MTD over several weeks • Increase weekly by 50 mg/day to 150 mg/day
Dosage frequency	Every 8 h	Every 8 h to 12 h
Usual effective dose	1200 mg/day to 2400 mg/day	150 mg/day to 600 mg/day
Maximum dose	3600 mg/day	600 mg/day

MTD Maximally tolerated dose

ANTI-DEPRESSANTS

- Most increase norepinephrine and serotonin
- TCAs: effective but anti-cholinergic with cardiac conductivity risks
- SNRIs: better safety profile
  - duloxetine is FDA approved anti-depressant for specific chronic pain conditions
  - venlafaxine and milnecipran (Fibromyalgia only)
- Neuropathic pain characterized by continuous dysesthesias (abnormal sensations) are generally believed to most likely to benefit from antidepressant management

ANTICONVULSANTS

- Carbamazepine (Tegretol), valproate (Depakene), phenytoin (Dilantin), clonazepam (Klonopin)
- Carbamazepine is limited in the cancer population because bone marrow suppression, in particular leukopenia
- Other common adverse effects: nystagmus, dizziness, diplopia, cognitive impairment, mood and sleep disturbance
- Dosing guidelines for phenytoin are similar to those for the treatment for seizures. This drug can be administered using a loading dose, which may be particularly useful in patients with severe pain.
- Gabapentin (Neurontin): somnolence, dizziness, ataxia, and fatigue.
- Clonazepam is an anticonvulsant from the benzodiazepine class, lancinating or paroxysmal neuropathic pain. Drowsiness and cognitive impairment

CORTICOSTEROIDS

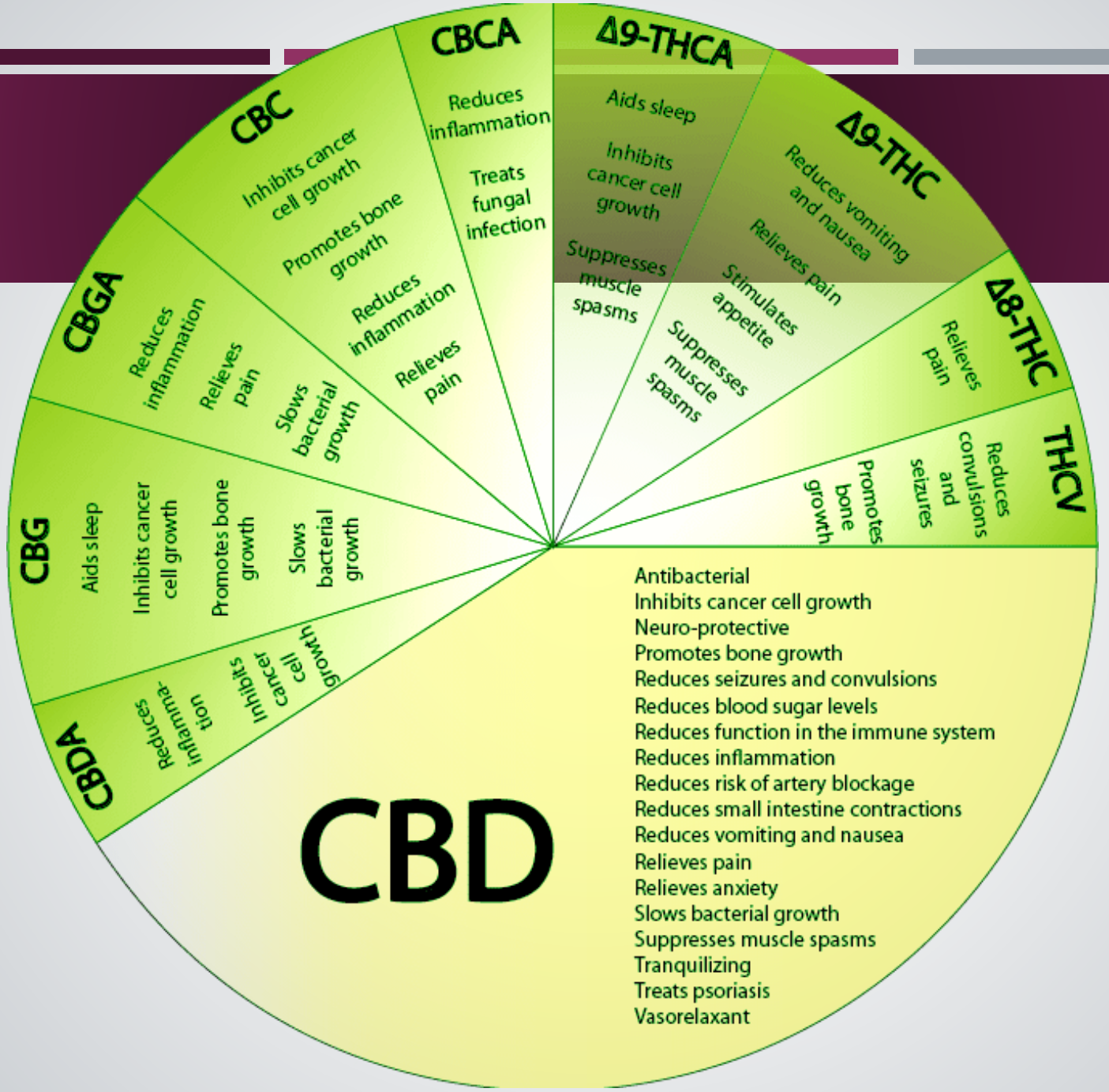
- Adjuvant analgesics for cancer pain of bone, visceral, and neuropathic origin.
- Adverse effects include neuropsychiatric syndromes, gastrointestinal disturbances, proximal myopathy, hyperglycemia, aseptic necrosis, capillary fragility, and immunosuppression. The risk increases with the duration of use.
- Often restricted to patients with a limited life expectancy; in addition, once effective pain control is obtained, it is commonly recommended that the dose be tapered as much as possible.
- High doses for short periods in patients with severe pain. This empirical approach recommends a regime of a single bolus of dexamethasone 100 mg IV followed by a small amount given 4 times per day and then tapered over the next few weeks

BISPHOSPHONATES

- Bone pain as well as the prevention of skeletal complications in patients with metastatic bone disease.
- Their use in a study of breast cancer patients resulted in improved quality of life compared with that of patients not using bisphosphonates.
- Most frequently used are clodronate, pamidronate, and zoledronic acid

OTHER

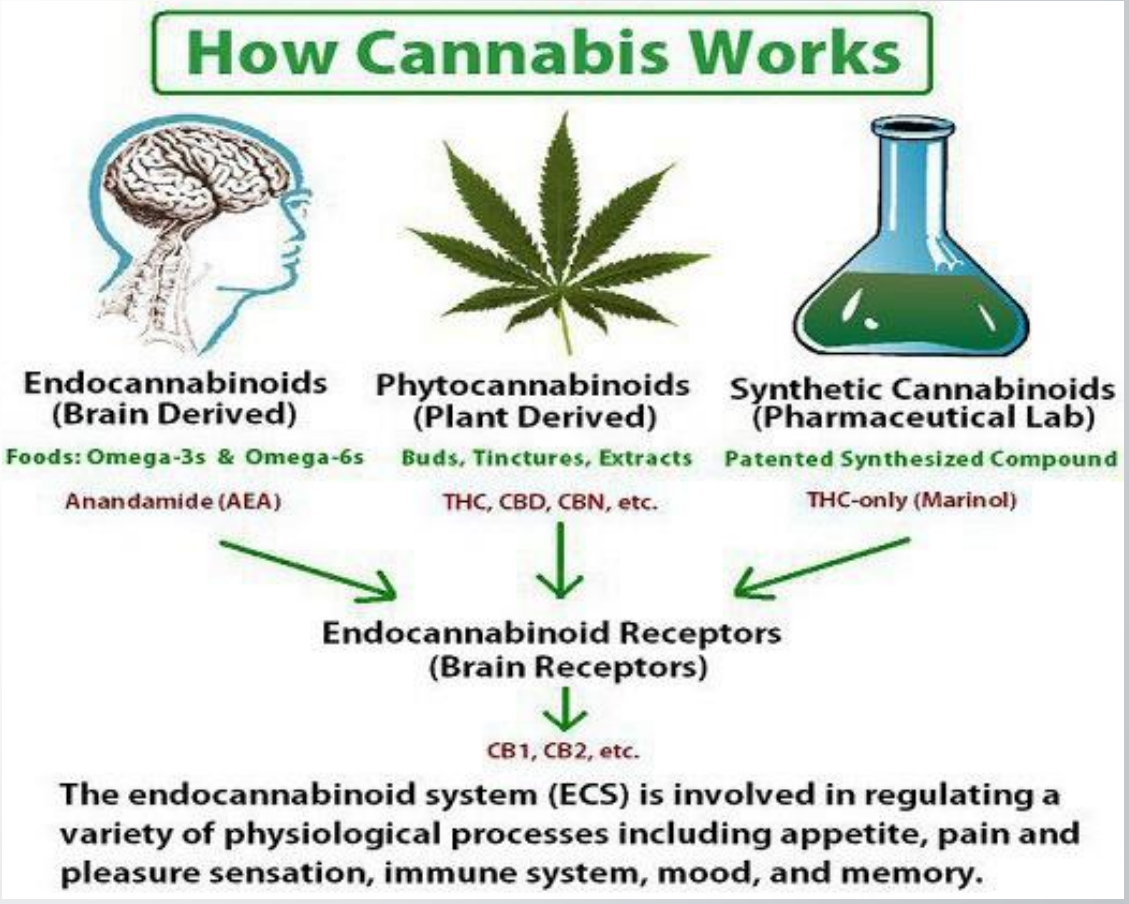
- Calcitonin: nasal spray or SC
- Bone pain (especially spinal fractures)


CBCA
Reduces inflammation
Treats fungal infection
Δ9-THCA
Aids sleep
Inhibits cancer cell growth
Suppresses muscle spasms
CBC
Inhibits cancer cell growth
Promotes bone growth
Reduces inflammation
Relieves pain
Δ9-THC
Reduces vomiting and nausea
Relieves pain
Stimulates appetite
Suppresses muscle spasms
CBGA
Reduces inflammation
Relieves pain
Slows bacterial growth
Δ8-THC
Relieves pain
CBG
Aids sleep
Inhibits cancer cell growth
Promotes bone growth
Slows bacterial growth
THCV
Reduces convulsions and seizures
Promotes bone growth
CBDA
Reduces inflammation
Inhibits cancer cell growth
CBD
Antibacterial
Inhibits cancer cell growth
Neuro-protective
Promotes bone growth
Reduces seizures and convulsions
Reduces blood sugar levels
Reduces function in the immune system
Reduces inflammation
Reduces risk of artery blockage
Reduces small intestine contractions
Reduces vomiting and nausea
Relieves pain
Relieves anxiety
Slows bacterial growth
Suppresses muscle spasms
Tranquilizing
Treats psoriasis
Vasorelaxant

MEDICAL MARIJUANA

- 100+ different cannabinoids have been identified.
- Endo- (endogenous to body)
- Phyto- (plant based)
- Synthetic
- Delta-9-tetrahydrocannabinol (Δ9-THC)

is the primary psychoactive cannabinoid.



MEDICAL MARIJUANA

- Endocannabinoid System (ECS) = receptors (expressed in nervous system), agents, channels, enzymes
  - CB1 (majority of cannabinoids in the brain, psychoactive)
  - CB2 (much lower expression, mainly in glial cells)
  - TRPV1
- The CB1 receptors are found mainly on neurons in the brain, spinal cord, and peripheral nervous system, but are also present in other organs and tissues
- The low number of CB1 receptors in the brain stem may help explain the absence of cannabis overdoses due to the depression of respirations.
- CB2 receptors are primarily found in immune cells, among them leukocytes, the spleen, and tonsils.

PHYTO-CANNABINOIDS

- THC and CBD (cannabidiol)
- THC binds both CB1 and CB2
- Cannabidiol (CBD) doesn't bind to CB1 or CB2, but inhibits THC binding to CB1
- Illinois Alternatives to Opioids Act = consider marijuana over opioids
- Gallup poll: 1 in 7 Americans use CBD, 11% 50-64 yrs old
- Pain relief, psychosis, anxiety, insomnia, arthritis, epilepsy (in June 2019, FDA approved purified form of CBD Epidiolex to treat 2 forms of epilepsy)
- Full spectrum CBD = ≤ 0.3% THC
- Forms: vapor, topical, tinctures, oil, SL spray
- Repeated administration is needed to decrease neuropathic pain and anxiety

The Confusion

Species I is a Hemp extract with all the cannabinoids except for THC, which means it has all the beneficial properties of cannabis without the HIGH!

APPROVED CONDITIONS FOR MEDICAL MARIJUANA IN OHIO

- AIDS
- HIV+
- Alzheimer's Dementia
- Cancer
- Chronic Traumatic Encephalopathy
- Crohn's Disease or Ulcerative Colitis (IBD)
- Epilepsy or other seizure disorder
- Fibromyalgia
- Tourette's Syndrome
- Glaucoma
- Hepatitis C
- Multiple Sclerosis
- Pain: chronic and severe, or intractable
- Parkinson's Disease
- Post-Traumatic Stress Disorder
- Sickle Cell Anemia
- Spinal Cord Disease or disorder
- Traumatic Brain Injury

MEDICAL MARIJUANA PROCESS

- Find a Certified to Recommend (CTR) Physician for evaluation, submit recommendation
- Physician creates a profile in Patient and Caregiver Registry of OMMCP, patient or caregiver completes profile to get active Registry Card
- 90 day supply with 3 refills
- Must have in-face CTR physician visit annually
- Registered/approved Dispensary
- https://medicalmarijuana.ohio.gov

TRAMADOL

Tramadol (Ultram, Ultram ER)-

Mild opioid agonist, so less dependency issues/low rates of abuse

Weak SNRI

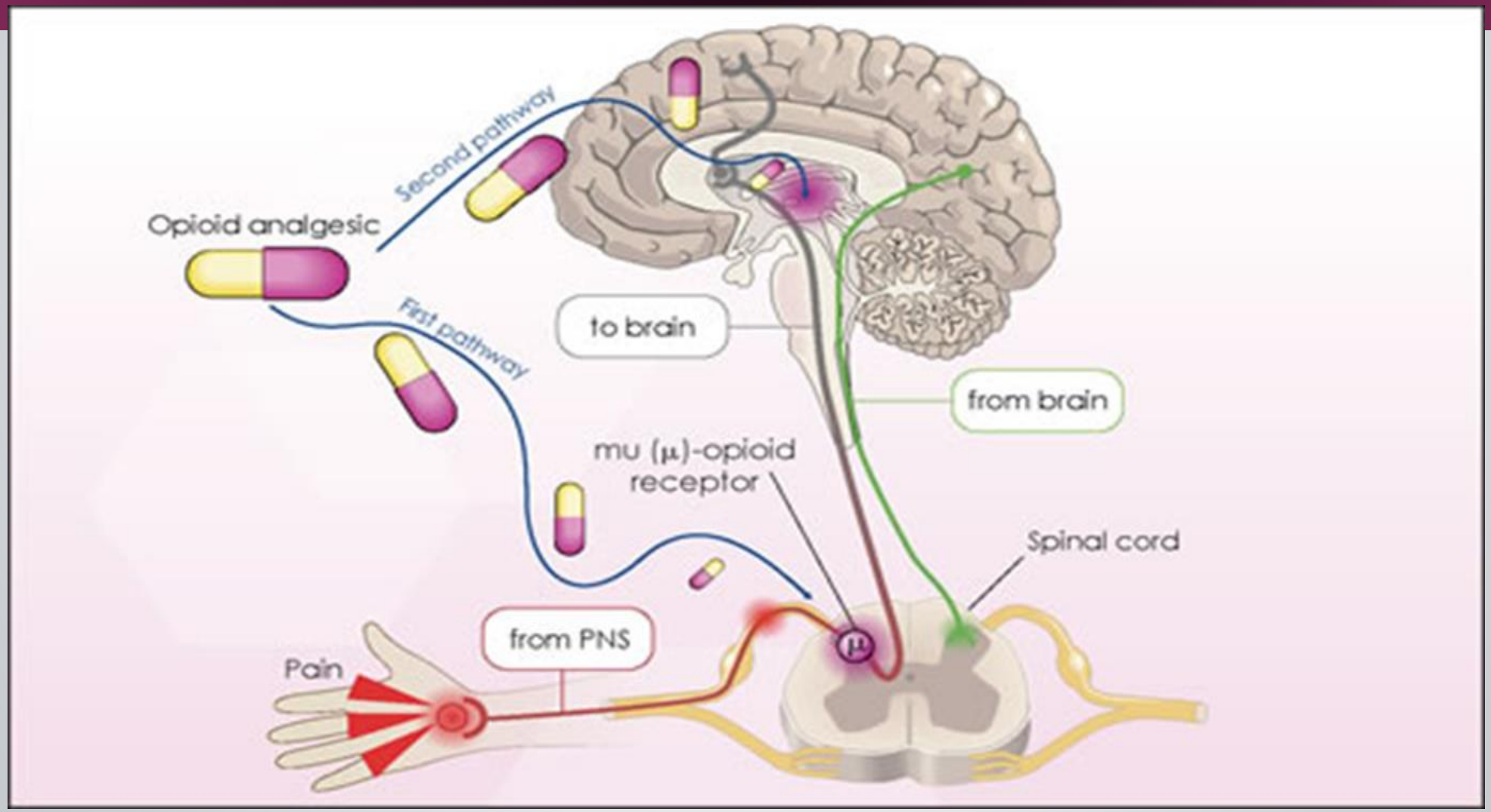
Lowers seizure threshold- do not give to patients with seizure disorder

To use for moderate to severe pain

Acute pain- 50 to 100mg po q4-6 hrs prn, max 3000mg/ day in elderly, renal dose adjustment

Chronic pain- Ultram ER 100, 200 or 300mg po daily

OPIOIDS


Second pathway
Opioid analgesic
First pathway
to brain
from brain
mu (μ)-opioid receptor
Spinal cord
from PNS
Pain

OPIOIDS

Pure agonists- opioid drugs that bind to mu-opioid receptors in the body

Binding produces naturally occurring endorphins, analgesia, euphoria, and other well-known opioid properties

Examples of full agonists: morphine, oxycodone, hydrocodone, fentanyl, methadone, etc.

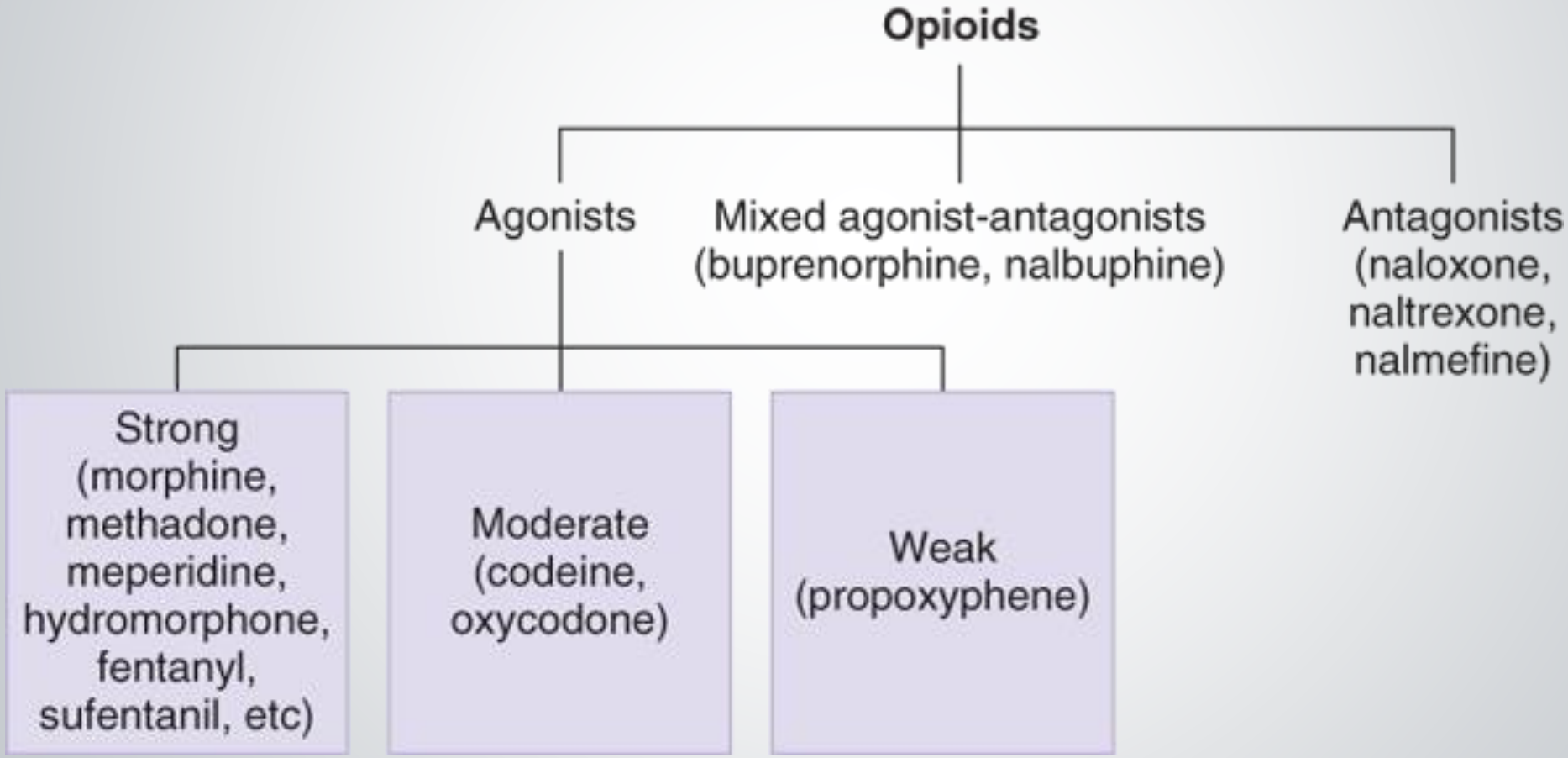
Partial agonists- opioids that bind to mu-opioid receptors; however, they produce endorphins to a much lesser extent than full agonists. When the dosage of a partial agonist is increased, the production of endorphins is not proportionately increased

An example of a partial agonist is buprenorphine

An antagonist is a medication that binds to the opioid receptor but does not stimulate endorphin production at all.

Examples of opioid antagonists are naltrexone and naloxone

OPIOIDS


Opioids
Agonists
Mixed agonist-antagonists (buprenorphine, nalbuphine)
Antagonists (naloxone, naltrexone, nalmefine)
Strong (morphine, methadone, meperidine, hydromorphone, fentanyl, sufentanil, etc)
Moderate (codeine, oxycodone)
Weak (propoxyphene)

OPIOID SAMPLE DOSES

Opioid agonist-antagonists

Buprenorphine, naloxone (Cassipa, Bunavail, *Suboxone, Zubsolv)

0.3 to 0.6mg IV/IM q6 hrs prn

5-20 mcg/ hr patch changed q7 days

*Suboxone- treatment of opioid dependence

8mg SL on day 1, 16mg SL on day 2, maintenance 16mg DL daily (can individualize to range of 4 to 24mg SL daily)

OPIOID SAMPLE DOSES

Opioid agonist-antagonists- con't

Butorphanol (Stadol)- 0.5-2 mg IV or 1-4mg IM q3-4hrs prn

Nasal spray- 1 spray (1mg) in 1 nostril q3-4hrs prn

Nalbuphine (Nubain)- 10-20mg IV/IM/SC q3-6hrs prn

Pentazocine (Talwin)- 30mg IV/IM q3-4hrs prn or Talwin NX 50mg PO q3-4 hrs prn

Opioid antagonists

Naloxone (Narcan)- 0.4 to 2mg q2-3 mins prn (for adult opioid overdose)

SAMPLE DOSES-

Opioid Agonists

Codeine- 0.5-1 mg/kg up to 15-60 mg PO/IM/IV/SC q4-6 hrs (do not use IV in children)

Fentanyl (Duragesic patch, Actiq lollipops/ lozenges, Fentora buccal tab- also nasal spray, IV)

Duragesic 1 patch q72 hrs (in mcg, 12, 25, 50, 75, 100)

Actiq 200 to 1600 mcg, goal is 4 lozenges per day in conjunction with long-acting opioid

Hydromorphone (Dilaudid)- major risk of abuse with significant euphoria

Chronic pain- Exalgo CR 8/12/16mg once daily

Can be given PO/IV/IM/SC 2-4 mg PO q4-6 hrs prn or 0.5-2mg IM/SC q4-6 hrs prn

Oxycodone 10-20mg PO q3 prn for healthy, 5-10mg PO q3 prn for frail adults

Oxymorphone 5-10mg PO q3 prn for healthy, 2.5-5mg PO q3 prn for frail adults

SAMPLE DOSES

Opioid Agonists- con't

Meperidine (Demerol)- no one uses anymore

Methadone (Dolophine, Methadose)

1. Severe pain in opioid-tolerant patients- start 2.5mg IM/SC/PO q8-12hrs prn, titrate up by 2.5mg per dose

   every 5-7 days as necessary (experienced practitioner can start at 10mg per dose)

2. Opioid dependence- typical dose to prevent withdrawal is 20mg PO daily, must be managed by experienced practitioner- treatment longer than 3 weeks is maintenance and only approved in treatment programs

Using Methadone

- "Start low, go slow" a good rule of thumb
- Find a model that works for you
- Watch for respiratory depression
- Do not fear the drug; use good medical / nursing / pharmacy practice principles
- One widely used dosing model is:
  - Milan Model (Ripamonti/Mercadente)
  - <100 mg MS = 4:1 MS:methadone
  - 100-300 mg = 8:1
  - 301-600 mg = 12:1

Medscape

Dosing

- Donny et al. (2002) have divided methadone dosing into three levels:

Level 1	Level 2	Level 3
Low dose <60mg	Medium dose 60-100mg	High dose >100mg
Holds the client, i.e. stops withdrawals	Reduces cravings for opiates	Full narcotic blockade

- In reality, dosing is far more nuanced than this.

- Studies have consistently shown that higher doses of methadone (>60mg per day) result in lower levels of heroin use and increased retention in treatment over lower doses of methadone (<60mg per day) (Seivewright 2009).

SAMPLE DOSES

Opioid Agonists – con't

Morphine forms: MS Contin (CR), Kadian, Avinza ER (off market now, since 2015), Roxanol (immediate release), Oramorph (CR), MSIR (immediate release)

MS Contin, Oramorph- CR tabs, start 30mg po q12hrs (titrate for chronic pain- 15/30/60/100/200mg)

Kadian- CR caps, start 20mg po q12 to 24 hrs (titrate for chronic pain, 10/20/30/50/60/80/100/200mg)

May be opened and sprinkled in applesauce

Roxanol- immediate relief, oral solution- used frequently in hospice/ palliative care (10mg/ 5mL, 20mg/5mL, 20mg/mL)

Start 20mg/mL, 0.25mL (5mg) PO/SL q4-6 hrs prn

Morphine 15-30mg PO q3 prn for healthy, 7.5-15mg PO q3 prn for frail adults

OPIOID SAMPLE DOSES

Oxycodone

Roxicodone (IR), Roxybond (IR tabs) OxyContin (CR), OxyIR, OxyFAST (liquid IR), Oxaydo (IR tabs), Xtampza (ER)

OxyContin CR- start 10-40mg PO q12hrs, titrate for chronic pain relief (10/15/20/30/40/60/80mg)

OxyIR- 5mg PO q4 to 6 hrs prn

OxyFAST- oral solution 20mg/mL, start 0.25ml (5mg) PO/SL q4 hrs prn pain

Roxicodone- 5/15/30mg tabs, 5mg caps- 5mg po q4-6 hrs prn pain

Oxymorphone (Opana IR, Opana ER off market since 2017)

IR- 10 to 20mg PO q4-6 hrs prn, 1 to1.5mg IM/SC q4-6hrs prn, 0.5mg IV q4-6 hrs prn

IR- 5/10mg

OPIOID COMBINATION AGENTS

Combination Agents

Fioricet with codeine- (APAP/butalbital/ caffeine)

Fiorinal with codeine- (ASA/ butalbital/ caffeine)

Lorcet- (hydrocodone/ APAP)

Lortab- (hydrocodone/ APAP)

Norco- (hydrocodone/ APAP)

Percocet- (oxycodone/ APAP)

Roxicet- (oxycodone/ APAP)

Tylenol with codeine

Tylox- (oxycodone/APAP)

Vicodin- (hydrocodone/ APAP)

Vicoprofen- (hydrocodone/ ibuprofen)

OPIOID SIDE EFFECTS

- Constipation (start docusate *and* senna when starting opioids), urinary retention, respiratory depression, pruritus, somnolence, neurotoxicity, worsening confusion/delirium (particularly in the elderly)
- Patient will not develop tolerance to anti-cholinergic side effects (constipation, urinary retention)
- Neurotoxicity: myoclonus, higher dosages reached quickly, all routes but especially parenteral, accumulation of toxic metabolites, setting of renal failure, dehydration, electrolyte disturbances
- Neurotoxicity? opioid rotation (replacement with another opioid at lower dose), hydrate
- Drowsiness is common. Rotate opioids, add non-sedating analgesic, decrease dose of opioid, trial of methylphenidate 5-10mg PO qAM and qNOON.

OPIOIDS

Medication	Onset	Duration	Parenteral Dosing (mg)	Enteral Dosing	Comments
Fentanyl	Rapid (<10 min)	Short (1–2 h)	0.1 mg IM/IV/SC	Not available orally	Also available in patch form
Hydromorphone	Quick (15–30 min)	Moderate (4–5 h)	1.0–2.0 mg IM/IV/SC	7.5 mg	
Methadone	Slow (45–60 min)	Long (6–8 h)	10 mg IM/IV/SC	20 mg	Commonly used for chronic pain
Morphine	Quick (15–30 min)	Moderate (4–6 h)	10 mg IM/IV/SC	60 mg	
Oxycodone	Quick (15–30 min)	Moderate (4–6 h)	Not available parenterally	30 mg	
Meperidine	Variable (10–45 min)	Short (2–4 h)	75 mg IM/IV/SC	300 mg	Typically not recommended due to efficacy studies
Codeine	Quick (15–30 min)	Moderate (4–6 h)	120 mg IM/IV/SC	200 mg	Most commonly given orally

MISUSE

- Addiction, overdose, and death risk are increased with higher doses
- Nearly 60% of patients using prescription opioids were also taking other prescription drugs that put them at higher risk of overdose:
  - 29% were prescribed benzodiazepines
  - 28% were prescribed muscle relaxants
  - 8% were prescribed all three medications concurrently
- Misuse of prescription opioids is a risk factor for heroin use-
  - 80% of people initiating heroin use report prior misuse of prescription opioids

MISUSE

- In 2014, Americans filled 245 million prescriptions for opioid pain relievers, making them the most frequently prescribed medication in the U.S
- If take opioids ≥30 days in the first year, 47% continued to do so for 3 years or longer
- Central pain syndromes (e.g., fibromyalgia, tension headaches) respond better to antidepressant and anticonvulsant medications than to opioids
- Chronic opioid use can lead to increased pain sensitivity, exacerbating pain conditions

FENTANYL

Columbus Dispatch, July 9, 2019

Six people died of drug overdoses in Franklin County in less than 13 hours Monday, the county coroner's office reported. The overdoses happened between 9:02 a.m. and 9:48 p.m. Monday. There were a total of nine overdose deaths between Saturday and Monday. The deaths were scattered around Columbus and Franklin County, with two concentration on Columbus' Northeast and South sides. "What we're seeing mainly is fentanyl being mixed with other drugs," said Dr. Anahi Ortiz, the Franklin County coroner. Of the overdoses that occurred Monday, Ortiz said two were caused by a mixture of cocaine and fentanyl; one involved a mixture of methamphetamines and fentanyl. One involved prescription pills and another was caused by drugs in an IV. The coroner is still investigating the sixth death. According to data gathered by Ortiz's office, there were 169 overdose deaths in Columbus from January to April, a 12% increase from last year's total of 150 during the same time.

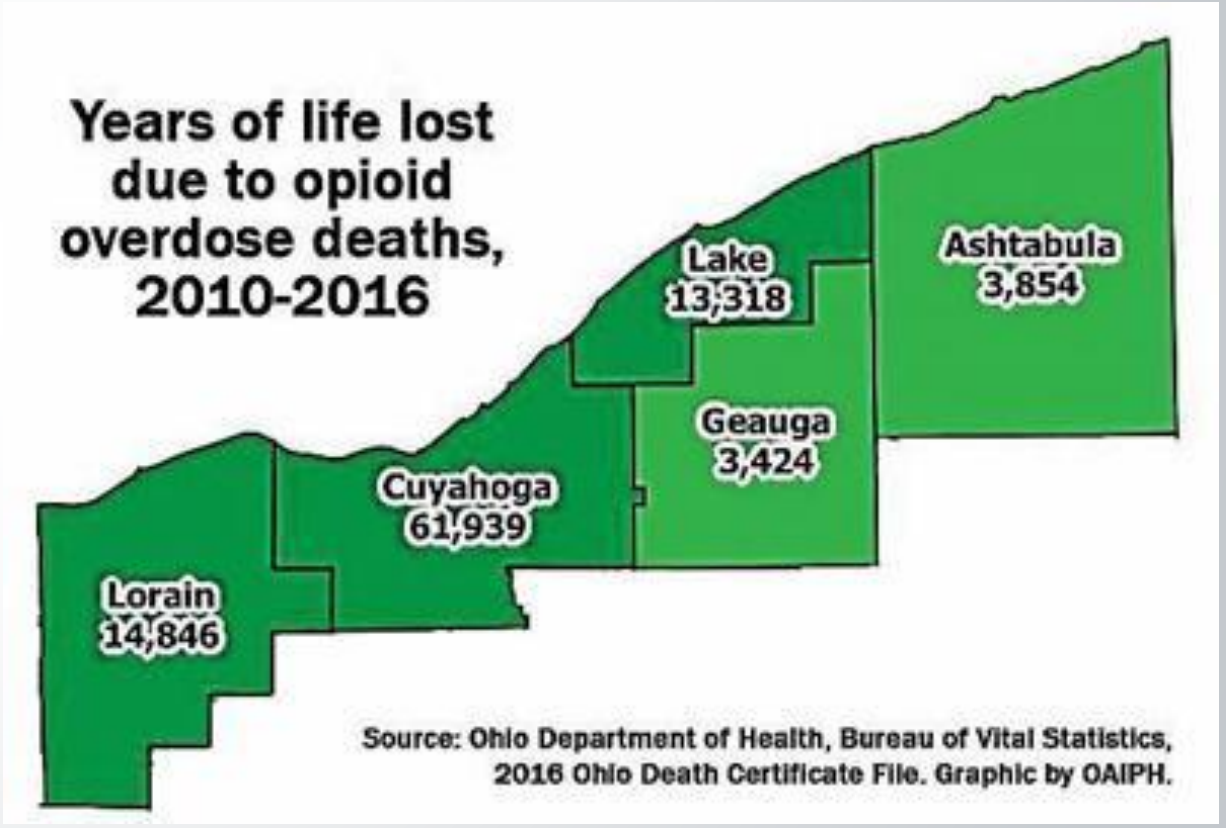
OPIOIDS

Washington Post,

The biggest civil trial in U.S. history will start with these Ohio counties (Summit, Cuyahoga)

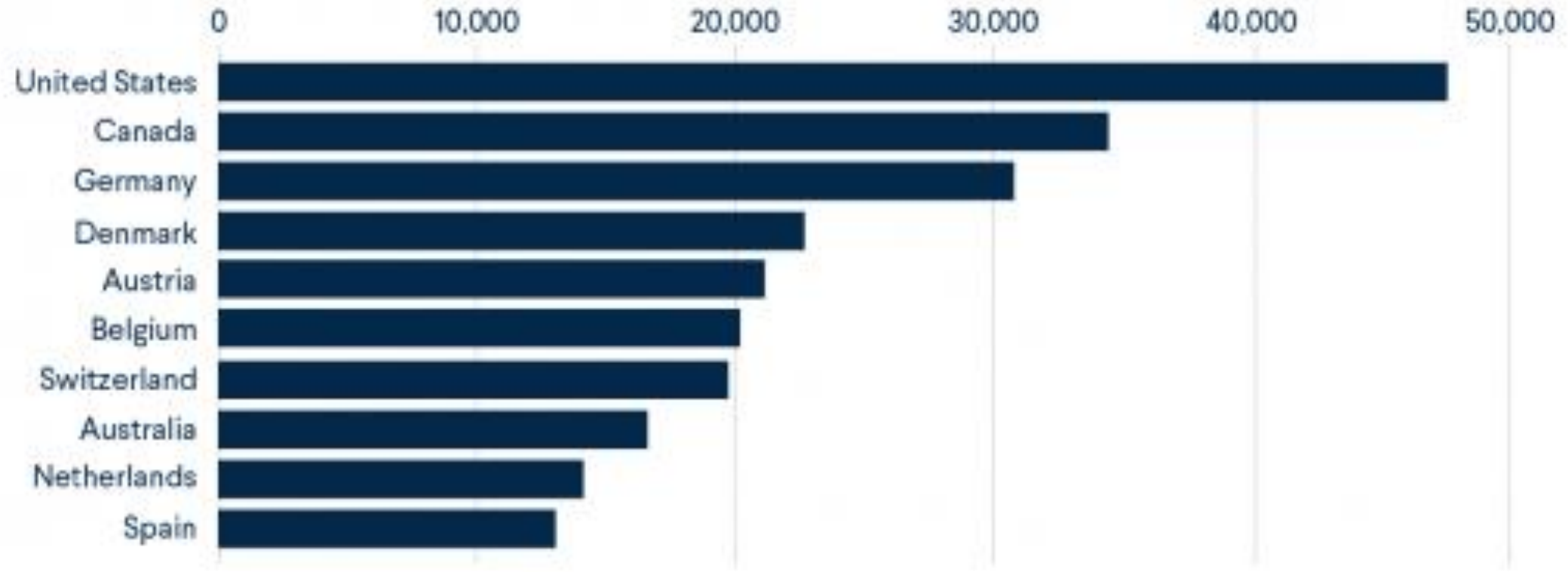
The CVS in this white working-class suburb of Cleveland is a three-hour drive and, culturally, even farther from the southern Ohio section of Appalachia that has become widely associated with the opioid epidemic.

Two other drugstores in this city of 80,000 placed second and fifth on the Drug Enforcement Administration's list of Cuyahoga County locations.



Countries Consuming the Most Opioids

Standard Daily Opioid Doses Per Million People, 2013–2015



Source: UN International Narcotics Control Board.

COUNCIL on FOREIGN RELATIONS

CDC GUIDELINES

Long-term Opioid Use Often Begins with Treatment of Acute Pain

- Prescribe the lowest effective dose possible.
- Prescribe no greater quantity than needed for the expected duration of pain severe enough to require opioid pain relievers (3 or fewer days will usually be sufficient).

CDC GUIDELINES

Determining When to Initiate or Continue Opioids for Chronic Pain

- Non-opioid therapies are preferred for chronic pain (including non-pharmacologic therapy).
- If opioids are prescribed, they should be used in combination with non-opioid therapy such as cognitive behavioral therapy, exercise therapy, physical therapy and/or non-opioid pharmacologic therapy such as nonsteroidal anti-inflammatory drugs and acetaminophen.
- Establish treatment goals–discuss risks, realistic benefits, and therapy discontinuation.
- Pain contract
- Reassess risks and benefits throughout treatment.

Pain Treatment With Opioid Medications: Patient Agreement

I, _____, understand and voluntarily agree that (initial each statement after reviewing):

_____ I will keep (and be on time for) all my scheduled appointments with the doctor and other members of the treatment team.

_____ I will participate in all other types of treatment that I am asked to participate in.

_____ I will keep the medicine safe, secure, and out of the reach of children. If the medicine is lost or stolen, I understand it will not be replaced until my next appointment, and may not be replaced at all.

_____ I will take my medication as instructed and not change the way I take it without first talking to the doctor or other member of the treatment team.

_____ I will not call between appointments, or at night or on the weekends looking for refills. I understand that prescriptions will be filled only during scheduled office visits with the treatment team.

_____ I will make sure I have an appointment for refills. If I am having trouble making an appointment, I will tell a member of the treatment team immediately.

_____ I will treat the staff at the office respectfully at all times. I understand that if I am disrespectful to staff or disrupt the care of other patients my treatment will be stopped.

_____ I will not sell this medicine or share it with others. I understand that if I do, my treatment will be stopped.

_____ I will sign a release form to let the doctor speak to all other doctors or providers that I see.

_____ I will tell the doctor all other medicines that I take, and let him/her know right away if I have a prescription for a new medicine.

_____ I will use only one pharmacy to get all of my medicines:

_____

Pharmacy name/phone#

_____ I will not get any opioid pain medicines or other medicines that can be addictive, such as benzodiazepines (Klonopin, Xanax, Valium) or stimulants (Ritalin, amphetamine), without telling a member of the treatment team ***before I fill that prescription***. I understand that the only exception to this is if I need pain medicine for an emergency at night or on the weekends.

_____ I will not use illegal drugs, such as heroin, cocaine, marijuana, or amphetamines. I understand that if I do, my treatment may be stopped.

_____ I will come in for drug testing and counting of my pills within 24 hours of being called. I understand that I must make sure the office has current contact information in order to reach me, and that any missed tests will be considered positive for drugs.

_____ I will keep up to date with any bills from the office and tell the doctor or a member of the treatment team immediately if I lose my insurance or can't pay for treatment anymore.

_____ I understand that I may lose my right to treatment in this office if I break any part of this agreement.

Pain Treatment Program Statement

We here at _____ are making a commitment to work with you in your efforts to get better. To help you in this work, we agree that:

We will help you schedule regular appointments for medicine refills. If we have to cancel or change your appointment for any reason, we will make sure you have enough medication to last until your next appointment.

We will make sure that this treatment is as safe as possible. We will check regularly to make sure you are not having bad side effects.

We will keep track of your prescriptions and test for drug use regularly to help you feel like you are being monitored well.

We will help connect you with other forms of treatment to help you with your condition.

We will help set treatment goals and monitor your progress in achieving those goals.

We will work with any other doctors or providers you are seeing so that they can treat you safely and effectively.

We will work with your medical insurance providers to make sure you do not go without medicine because of paperwork or other things they may ask for.

If you become addicted to these medications, we will help you get treatment and get off of the medications that are causing you problems safely, without getting sick.

Patient signature _____

Patient name printed _____

Date _____

Provider signature _____

Provider name printed _____

Date _____

Source: National Institute on Drug Abuse; National Institutes of Health; US Department of Health & Human Services

OPIOID SELECTION

- **Opioid Selection, Dosage, Duration, Follow-up & Discontinuation**
- Prescribe immediate-release opioids instead of extended-release/long-acting opioids.
- Start low and go slow–prescribe opioids with the lowest possible effective dose; reassess individual benefits and risks when considering increasing dosage to ≥50 morphine milligram equivalents (MME)/day; avoid increasing dosage to ≥90 MME/day unless justified.
- Evaluate benefits and harms within 1 to 4 weeks of starting opioid therapy for chronic pain or of dose escalation. If benefits do not outweigh harms, discuss considerations for discontinuation of opioid therapy.

ASSESSING RISK

- **Assessing Risk and Addressing Harms of Opioid Use**
- Risk factors include pregnancy, kidney disease, being 65 years of age or older, mental health conditions, substance use disorder, prior nonfatal overdose, and others.
  - Incorporate strategies to mitigate risk; offer naloxone when a patient is at increased risk of opioid overdose.
  - Use a validated screening tool, such as the single question screener, the Drug Abuse Screening Test (DAST), or the Alcohol Use Disorders Identification Test (AUDIT), to find out about a patient's substance use.
- Use Prescription Drug Monitoring Programs (PDMPs) to determine concurrent opioid use
- Use urine drug test screening to test for concurrent illicit drug use.
- Avoid concurrent prescribing of other opioids and benzodiazepines if possible.

DEA Controlled Substance Schedules

- All scheduled drugs/substances have potential for dependence and abuse.
- Schedule I substances are the most "dangerous"; Schedule V have the lowest potential for dependence and abuse.

Schedule I	No consensus-accepted medical use High potential for abuse Severe psychological or physical dependence	**heroin, LSD, marijuana, methaqualone, peyote**
Schedule II	High potential for abuse Potentially severe psychological or physical dependence Considered "dangerous"	**Opioids:** hydrocodone, morphine, methadone, hydromorphone, meperidine, oxycodone, fentanyl **Amphetamines:** methamphetamines, cocaine, dexedrine, Adderall, Ritalin
Schedule III	Moderate to low potential for psychological/ physical dependence Drug abuse potential lower than Schedule II	**Opioids:** codeine **Anesthetic**: Ketamine **Male sex hormones:** anabolic steroids, testosterone
Schedule IV	Low risk for potential abuse and dependence	**Opioids**: Tramadol, Talwin **Benzodiazepines**: Xanax, Ativan, Soma, Valium **Sedative:** Ambien
Schedule V	Lower potential for abuse or dependence	**Anticonvulsant/neuropathy**: Lyrica **Cough preparations:** Less than 200 mg of codeine **Antidiarrheals**: Lomotil, parapectolin, Motofen

INTERVENTIONAL PAIN

Pain not responding to opioids, major side effects from opioids, persistent escalation of pain medications, patient wants to minimize opioids, medically stable and relatively healthy (no current chemo or radiation, no blood thinners)

- Epidural tunneled catheter
- Intrathecal pain pump
- Nerve blocks*
  - Femoral[1]
  - Lateral cutaneous
  - Psoas
  - Superior hypogastric plexus (pelvic pain)

*See separate lecture on nerve blocks

Acute and Chronic Pain Management

References

Vrooman, et. al., **Morgan and Mikhail's Clinical Anesthesiology**, 6th edition, 2019, McGraw-Hill, New York NY

www.atrainecu.com, chronic pain management

Adapted from Von Korff M, Saunders K, Thomas Ray G, et al. De facto long-term opioid therapy for noncancer pain. Clin J Pain. 2008 Jul–Aug; 24(6):521–527 and Washington State interagency guideline on prescribing opioids for pain; 2015.

WV Dept of Education, Rebecca King MSN, MEd, RN, Paula Fields MSN, RN