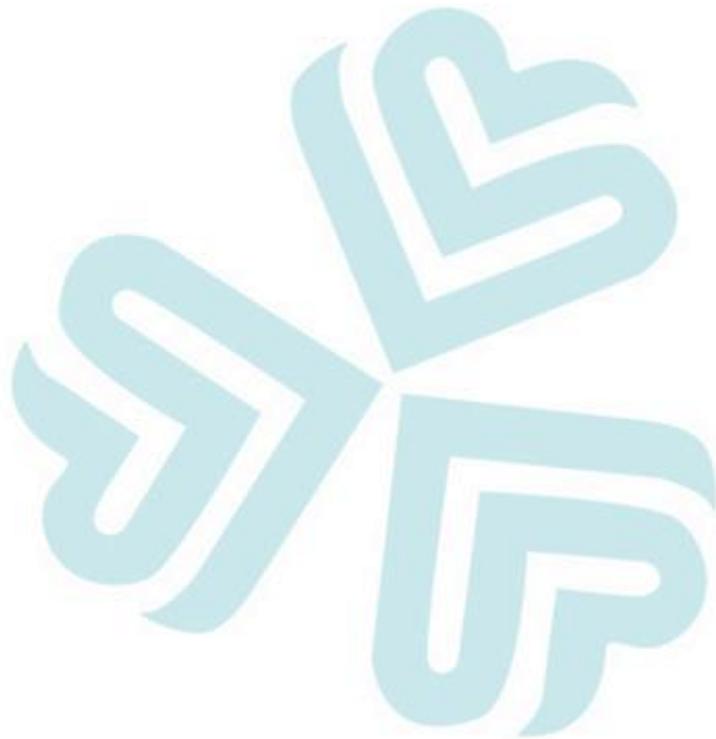


Understanding and Optimizing Pain Management



AVATAR

Same Day Joint Replacement Surgery

THE
KNEE • HIP • SHOULDER
CENTER

WHAT IS PAIN?

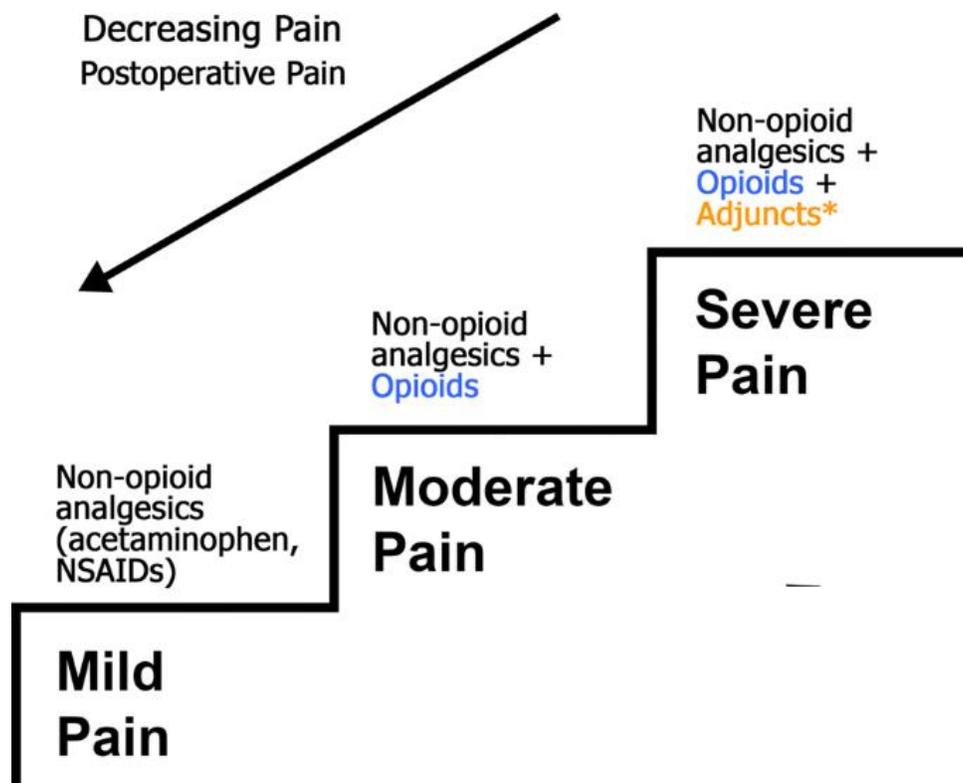
What is pain?

- Physical pain results from insult or injury to the body
- The perception of pain is a complex phenomenon that has physical, emotional and cultural components
- Each individual has a different threshold of what they consider a tolerable or acceptable level of pain
- This is referred to as pain tolerance



PAIN MANAGEMENT

- Joint replacement surgery will inevitably result in postoperative pain.
- Our goal is to keep the level of this pain within an acceptable range for our patients so they can actively participate in the recovery process
- This is referred to as **pain management**



PAIN MANAGEMENT GOALS

- Patients who understand pain management are more likely to be able to manage their pain effectively
- WE CANNOT MAKE SURGERY PAIN-FREE

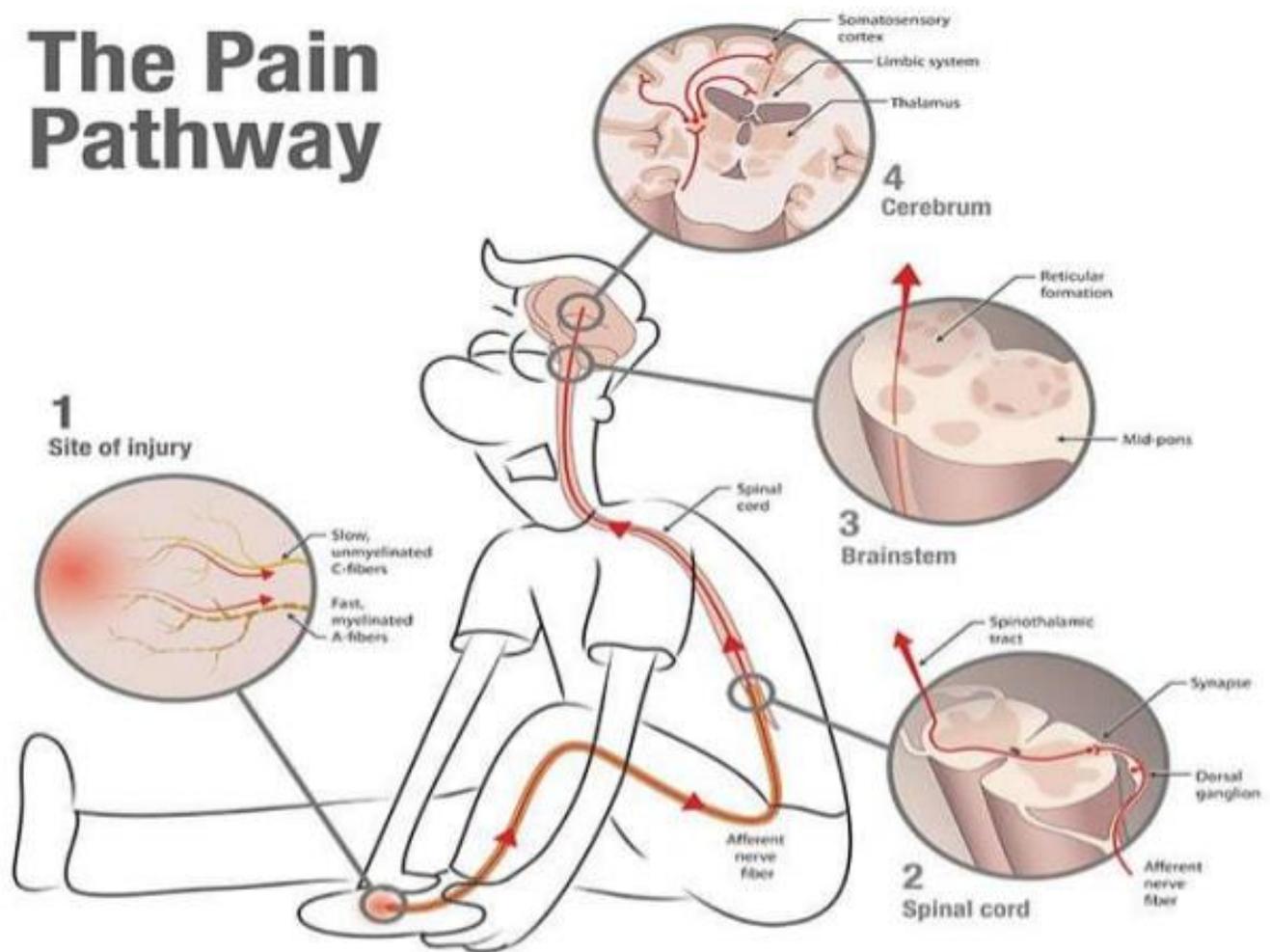
Achieve	Minimize	Limit	Allow
Achieve a manageable level of discomfort	Minimize opiate medications	Limit side effects from pain medications	Allow regular physical therapy to achieve functional goals

- The 4 P's of pain management can help conceptualize the goals



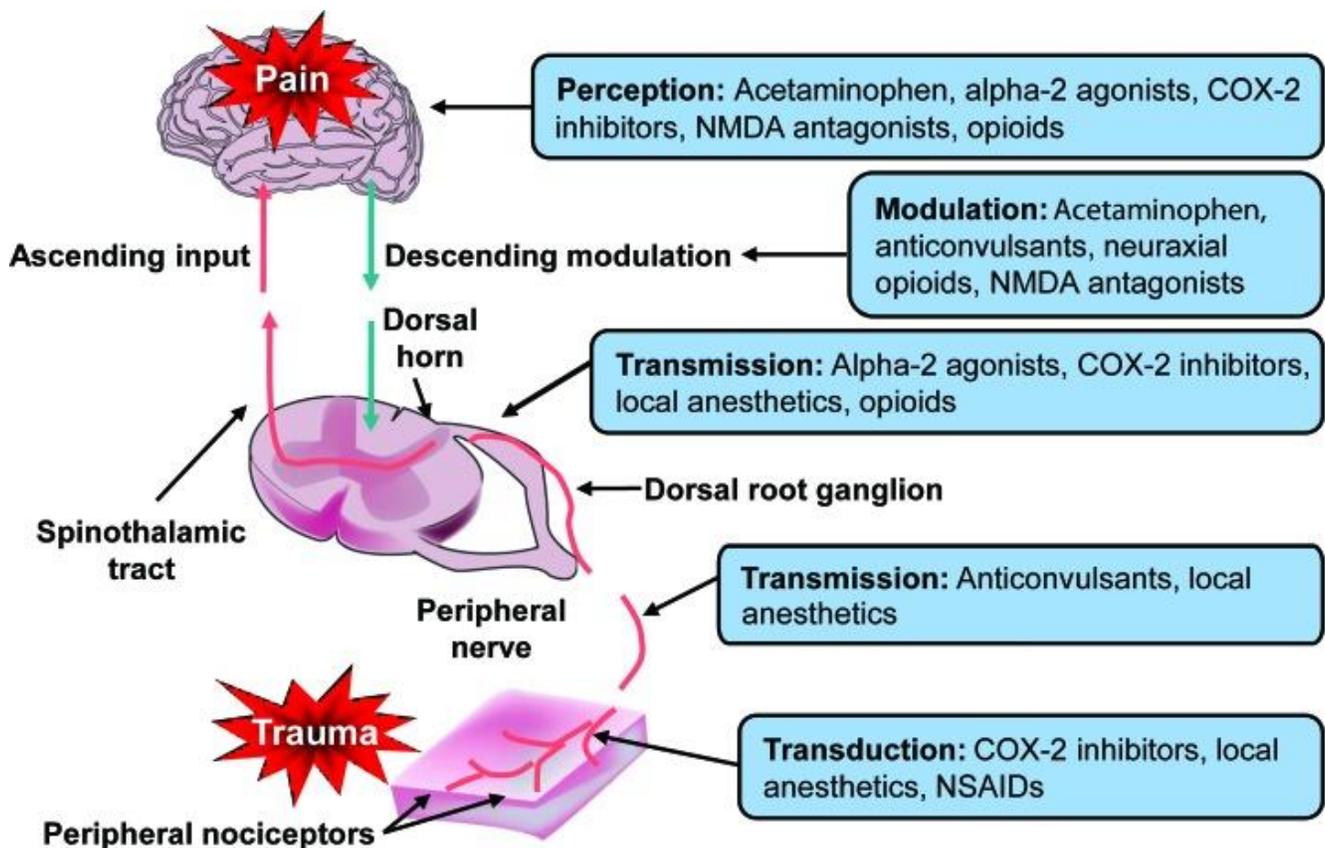
THE PAIN PATHWAY

- The sensation of pain travels from the site of injury, along a peripheral sensory nerve, to the spinal cord and to the brain.
- The perception of pain occurs in the brain



MULTIMODAL ANALGESIA

- Pain can be addressed at multiple levels along the pain pathway using different strategies that work at each level.
- Rather than treating just one level, treating all levels can provide more thorough pain management.
- This strategy is referred to as **multimodal analgesia**
- While none of these medications may be effective alone, the **combined effect is greater than the sum of the individual medications**



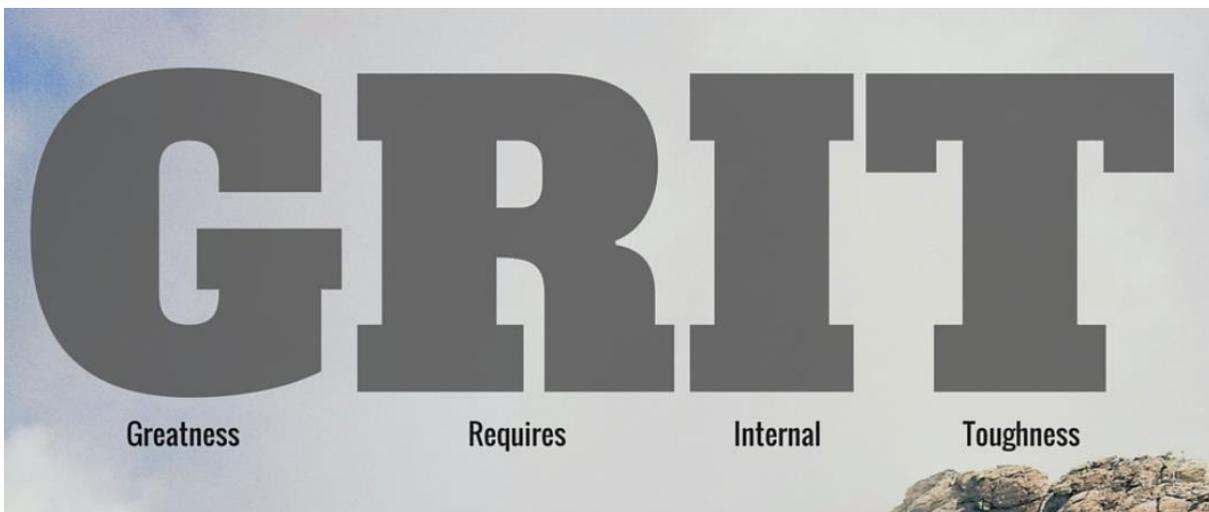
OPIOID SPARING SURGERY

- With these strategies and proper preparation for surgery (both mental and physical) many patients can limit the number of opiate medications they require after surgery
- This reduces negative side effects and problems with tolerance and withdrawal



THE ROLE OF GRIT AND DETERMINATION

- **Grit = perseverance, passion, hardiness and resilience** for long term meaningful goals
- Motivation and determination to achieve a great result increase the likelihood of success
- Pain may fluctuate from day to day, and it is important not to focus on short-term bumps in the road
- Focus on the end-goal and a positive outlook



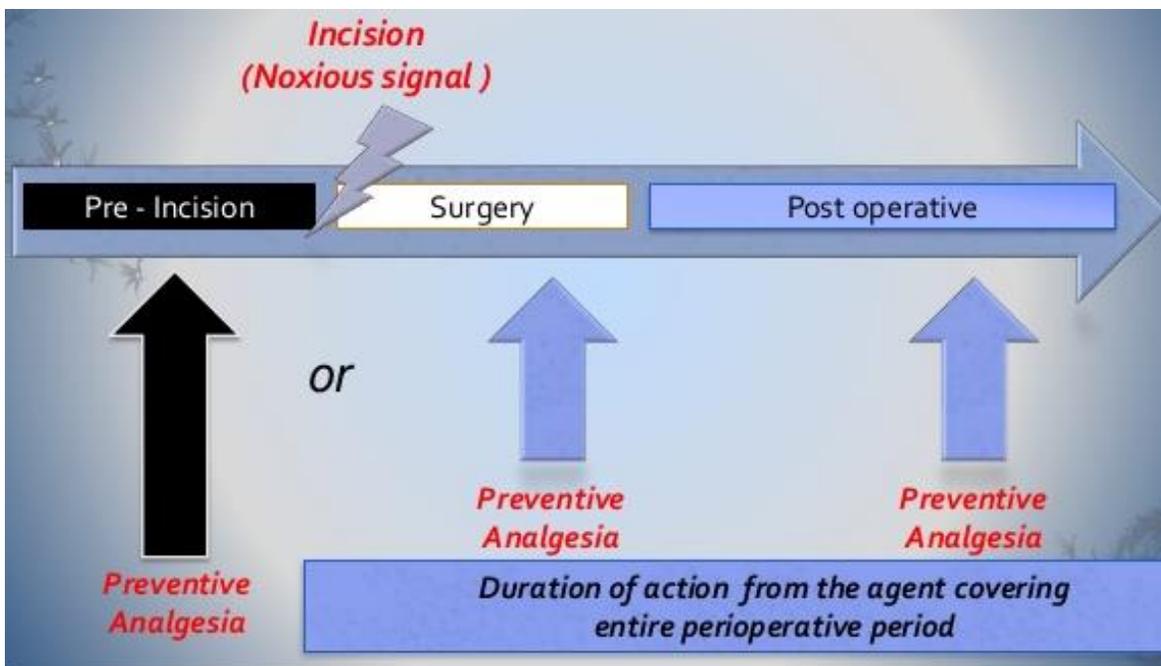
THREE PHASES OF PAIN MANAGEMENT

- **Preoperative:** from 3 days prior to surgery to immediately before surgery
- **Intraoperative:** during the surgery
- **Postoperative:** after the surgery and continuing throughout the recovery



PREOPERATIVE PHASE

- Research has shown that taking certain medications *before* surgery can lead to less pain after surgery
- This is called **PREVENTIVE ANALGESIA**
- Introduction of an analgesia regimen before the surgery with the goal of preventing sensitization of the central nervous system to subsequent stimuli that can amplify pain
- Involves both regional nerve blockades and oral medications
- Aim is to reduce acute pain that can subsequently lead to chronic pain



PREOPERATIVE PHASE

- We advise patients to take **Tylenol ES 2 pills (1000mg) 3x/day** starting 3 days before surgery
 - **Do not take this on the morning of surgery as it will be administered just prior to your surgery**
- Just prior to surgery in the preoperative holding area, we give additional medications provided there are no contra-indications.
- These include
 - **Tylenol 1000mg**
 - **Celebrex 200-400mg**
 - **Decadron 10 mg**



PREOPERATIVE PHASE

- **REGIONAL NERVE BLOCKS**

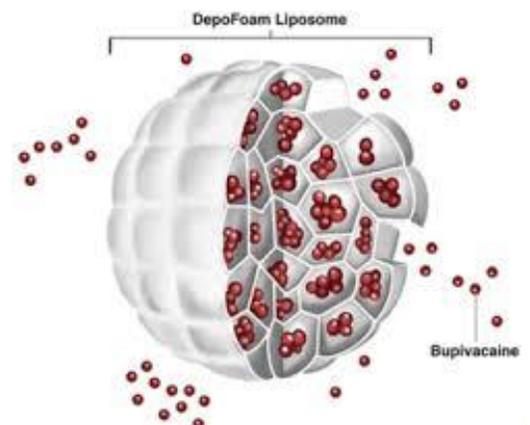
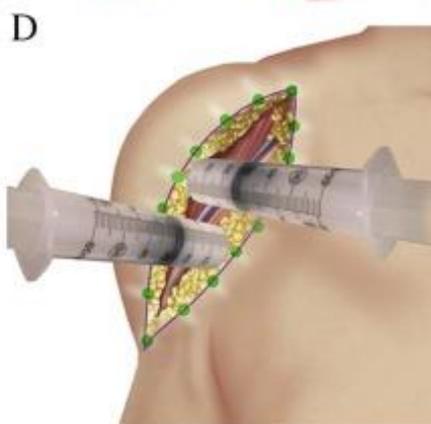
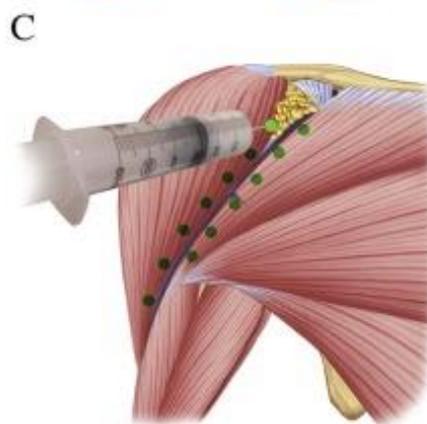
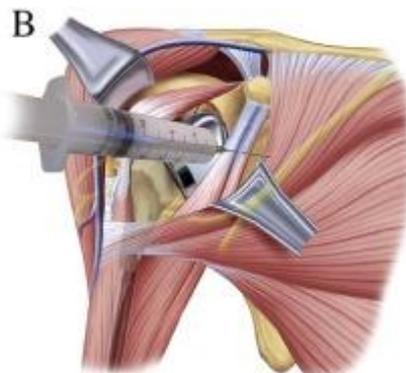
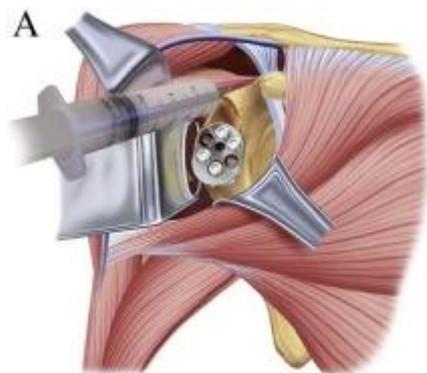
- Sensory nerves for shoulders and knees can be anesthetized with local anesthetic before surgery
- This is done by the anesthesiologist using an ultrasound in the preoperative holding area
 - **Knee = adductor canal block**
 - **Shoulder = interscalene block**
- These nerve blocks may provide 12-24 hours of pain relief after surgery
- Nerve blocks are not possible for hip replacement surgery but usually not necessary



INTRAOPERATIVE PHASE

• EXPAREL

- This is a long-acting local anesthetic that time-releases over 2-3 days
- It is mixed with another shorter acting local anesthetic called Marcaine
- It is injected all around the joint at the time of surgery
- This implants the medication into the soft tissues including the joint capsule, ligaments, muscles and skin



POSTOPERATIVE PHASE

• GENERAL PRINCIPLES

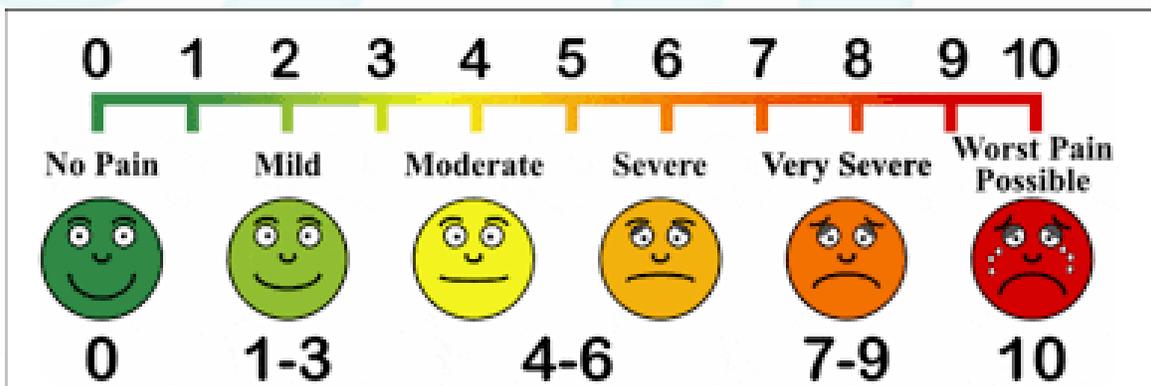
- It is important to stay ahead of the pain rather than play catch-up
- This can best be accomplished by taking medications on a fixed schedule for the first few weeks after surgery
- As the postoperative pain subsides you can begin to taper the stronger medications first and use over the counter medications as needed
- It is important to have enough comfort to perform your exercise routine for proper rehabilitation



MULTIMODAL ANALGESIA AND OPIOID SPARING SURGERY

• GENERAL PRINCIPLE

- As previously mentioned to goal of using a combination of medications is to provide a baseline of comfort that allows you to minimize use of opioid or narcotic pain medications
- You should aim to use the lowest dose of opiates that provides manageable pain relief
- This recognizes that pain is normal and to be expected after surgery
- The goal is not to medicate yourself to a pain level of zero but to a level that is tolerable
- This level is different for everyone



NON-MEDICATION STRATEGIES

I = ICE

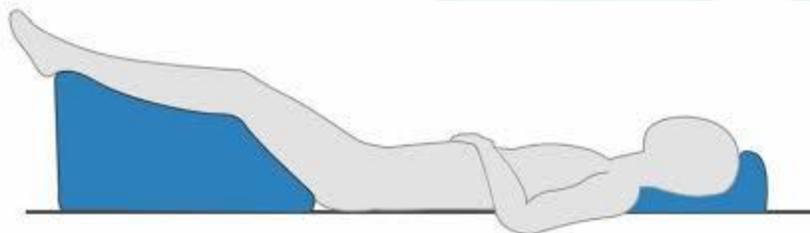
- Knee specific ice wraps can be purchased online
- Homemade ice packs can also be made as follows
 - 1 cup rubbing alcohol
 - 3 cups water
 - Mix in ziplock freezer bag
 - Double bag to reduce risk of leak

C = COMPRESSION

- Always wrap from the foot toward the thigh
- Wrapping should be snug but not too tight

E = ELEVATION

- Elevation requires putting the level of the operative limb above the heart.



SWELLING CONTROL

- Swelling can act like glue for a knee replacement causing increased pain and stiffness
- Active swelling control is important immediately after surgery and on a regular schedule
- Ice and elevation (toes above the nose) are the best methods of swelling control
- Ice can be performed while in the CPM and between CPM sessions for 30 minutes at a time
- Elevation should be performed when not in the CPM also for 30 minutes at a time

EFFLEURAGE SOFT TISSUE MASSAGE

- Effleurage is a massage technique to reduce swelling that patients can apply to themselves or have performed by a coach, spouse or caregiver
- This involves using the fingers and palms to massage the tissue on either side of the knee from below the knee to above the knee
- This pushes fluid out of the limb and back toward the heart
- Apply lubrication to the skin when performing effleurage



POSTOPERATIVE PHASE

• Tylenol (Acetaminophen)

- **Maximal Daily Dose** = 3000mg
- **Recommended Regimen** = 1000mg (2 pills) every 8 hours
 - Each extra strength pill = 500mg
 - Start 3 days prior to surgery and continue for 2-6 weeks after surgery as needed
- **Side effects:** generally few
- **Contraindications:** Liver disease such as hepatitis or cirrhosis



POSTOPERATIVE PHASE

• Nonsteroidal Anti-inflammatory (NSAIDS)

- **Effect:** reduces postoperative inflammation
- **Type:** many brands on the market – this will be customized for each patient
 - Aleve 2 pills twice daily
 - Ibuprofen 3 pills 4 times daily
 - Meloxicam 1 pill once or twice daily
 - Celebrex 1 pill twice daily
- **Schedule:** start the evening of surgery as instructed and continue x 4-6 weeks
- **Side Effects:** GI upset
- **Contraindications:** history of stomach ulcers, blood thinner medications



AKA: Advil, Motrin



AKA: Aleve, Naprosyn

POSTOPERATIVE PHASE

• Ultram (Tramadol)

- **Role:** centrally acting pain medication
- **Recommended Dose:** 1-2 pills every 6 hours
- **Side Effects:** dizziness, headache, drowsiness, nausea and vomiting, constipation
 - **Note:** stopping Tramadol abruptly can cause withdrawal symptoms so we recommend a slow wean to prevent this
- **Contraindications:** patients on certain anti-depressants have a rare chance of serotonin syndrome. We recommend a trial of Tramadol preoperatively to assure patients will tolerate it.



POSTOPERATIVE PHASE

• Oxycodone (OxyIR)

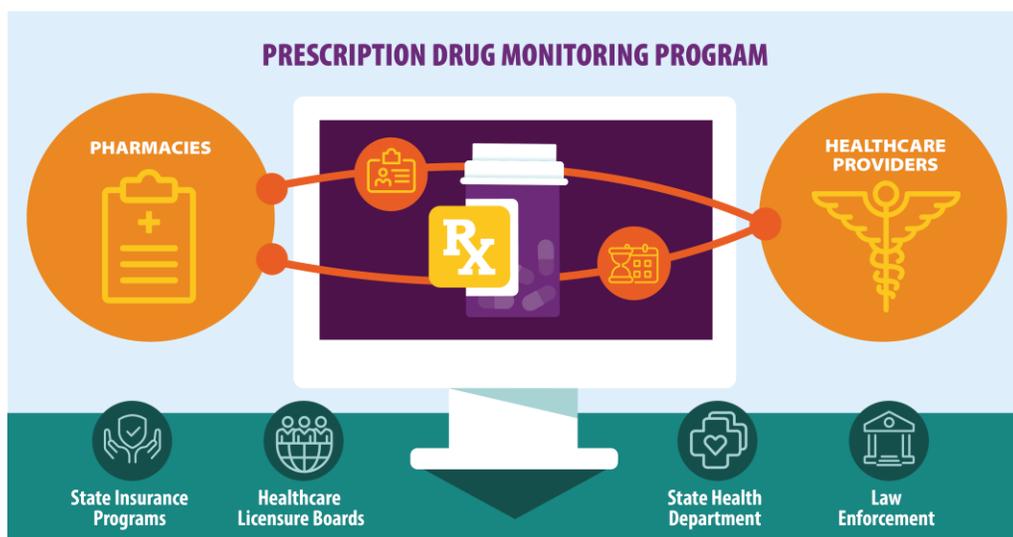
- **Role:** opioid medications that specifically treats pain
- **Schedule:** 0.5 to 2 pills every 4-6 hours as needed
- **Side Effects:** nausea, vomiting, drowsiness, constipation
- **Notes:**
 - **Prolonged use of opiate medications can result in dependence and addiction**
 - The intent is to **use this only if necessary** after taking all other medications
 - The goal is to stop the use of opioids as soon after surgery as possible
 - Overdosing on opioids can cause respiratory depression and death



POSTOPERATIVE PHASE

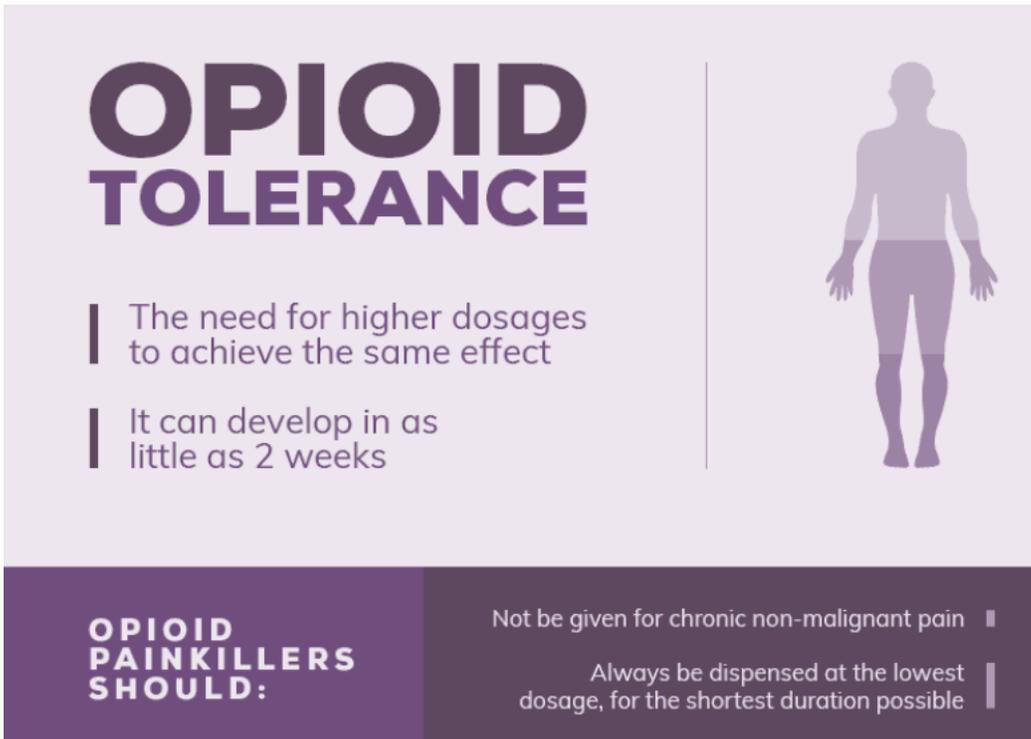
• Other Opioid Medications

- Some patients tolerate certain opioids better than others
- Other medications we sometimes prescribe include:
 - Dilaudid (Hydromorphone)
 - Norco (Hydrocodone)
 - Morphine
 - Tylenol #3
- If you have had problems with any particular medication in the past, please let us know so we can address any potential side effects
- **All of these have the potential for tolerance and addiction with long-term use**
- **Opioids are controlled substances monitored and regulated by the DEA through the Prescription Drug Monitoring Program (PDMP)**



OPIOID TOLERANCE

- Prolonged use of opiates can result in tolerance
- This means that higher doses are required to achieve the same level of pain relief
- Patients who are on chronic opiate therapy for other types of pain often have a difficult time with pain management after joint replacement
- **Studies have shown that patients on chronic opiate therapy are at risk for worse outcomes due to difficulty with postoperative pain management**



OPIOID TOLERANCE

- The need for higher dosages to achieve the same effect
- It can develop in as little as 2 weeks

OPIOID PAINKILLERS SHOULD:

- Not be given for chronic non-malignant pain
- Always be dispensed at the lowest dosage, for the shortest duration possible

The infographic features a purple background with a white silhouette of a human figure on the right side. The text is in white and purple, with the title 'OPIOID TOLERANCE' in large, bold, purple letters. The bullet points are in white, and the bottom section is in a darker purple with white text.



OPIOID TOLERANCE

- For this reason, we strongly recommend that patients taper off opioid medications well prior to surgery so they may have more effective pain management after surgery
- If you are treated by a chronic pain specialist, you should discuss a strategy for this well before the surgery and have a specific plan for perioperative pain management

POSSIBLE TAPER SCHEDULE:

- 10% per week: 10% of 80 = 8mg
- Difficult dosing schedule with 8mg, try 10mg (12.5%) and monitor closely for withdrawals

Week	Dose	# of Tablets
1	70mg	7 x 10/325mg
2	60mg	6 x 10/325mg
3	50mg	5 x 10/325mg
4	40mg	4 x 10/325mg
5	30mg	3 x 10/325mg
6	20mg	2 x 10/325mg
7	10mg	1 x 10/325mg

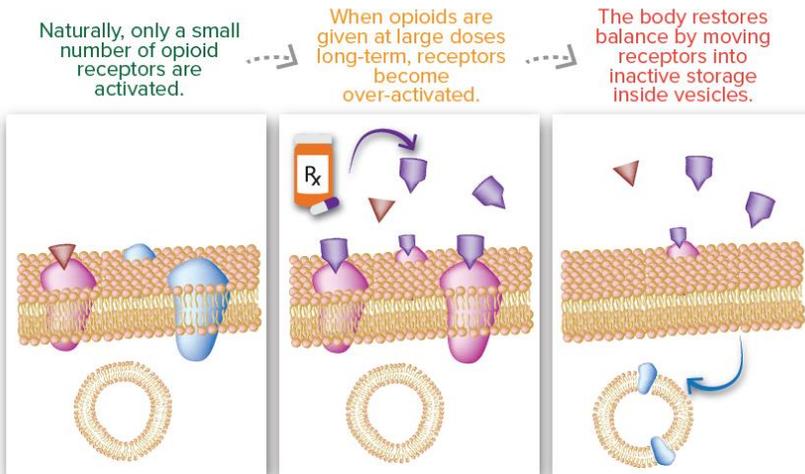


OPIOID TOLERANCE

- Long-term, regular use of opioids can cause withdrawal symptoms if the medication is abruptly stopped
- To avoid this, we urge patients to limit opioid consumption after surgery and focus on non-opioid medications using our multimodal regimen
- If patients have been on opioid therapy for a few weeks after surgery, we recommend a gradual taper rather than abruptly stopping the medication

Tolerance, dependence, & withdrawal @DrMingKao

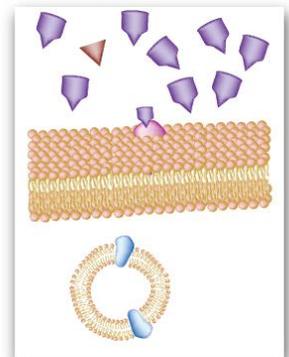
While each patient is on opioids for a different reason, every person on opioids is equally subject to its powerful effects. The most dangerous effects are "tolerance" & "withdrawal", which are not "addiction".



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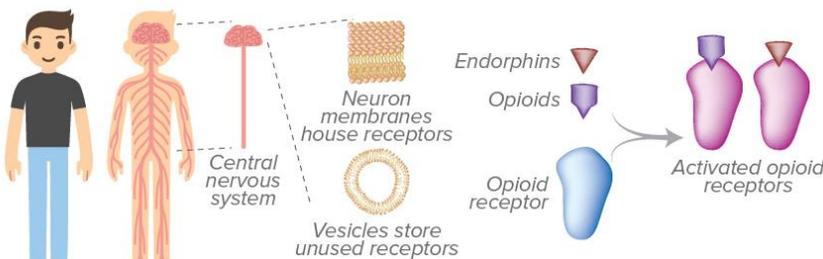
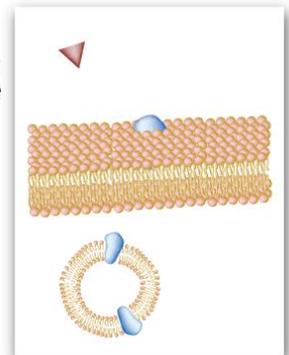
Opioid Tolerance & Opioid Dependence

With few receptors left, regardless of dose opioids, only a few receptors will be activated. The few receptors also require continuing opioids to maintain activity,



Opioid Withdrawal

If opioids are stopped suddenly, the few receptors that are left are also turned off. This causes opioid withdrawal symptoms.



OPIOID WITHDRAWAL

Signs and symptoms of opioid withdrawal syndrome²⁸

	Abdominal cramps	Mydriasis	
Loss of appetite	Anorexia	Nausea	
	Anxiety	Piloerection	Goose bumps
Sweating	Diaphoresis	Restlessness	
	Diarrhea	Rhinorrhea	Runny Nose
	Dizziness	Shivering	
	Hot flashes	Sneezing ^a	
High blood pressure	Hypertension	Tachycardia	Rapid heart rate
	Insomnia	Tremor	
	Lacrimation	Yawning ^a	
Muscle and joint pains	Myalgias or arthralgias		

- Typically these symptoms will pass in 1-2 days
- Mild symptoms can be treated with Tylenol, NSAIDS, hydration and rest
- If you experience any of these symptoms, please contact us so that we can make recommendations

BOWEL MANAGEMENT

- Constipation is common from surgery and pain medication
- A good bowel regimen can help minimize this problem
- This can be started 1-2 days prior to surgery to jump start the process
- This includes:
 - High fiber foods
 - Prune juice
 - Miralax 17gram mixed with 8oz water
 - Colace 100mg twice a day
- If constipation persists after 5 days consider the following
 - Glycerin suppository
 - Fleets enema

BEST FOODS FOR @ggfiber CONSTIPATION



apple
4g per fruit



GG Scandinavian Fiber Crispbread
4g per cracker



french lentils
4g per 1/4 cup, dry



mandarin orange
5g per cup



spinach
5g per cup, cooked



black beans
5g per cup



green peas
9g per cup, cooked



orange
3g per fruit



orange lentils
4g per 1/2 cup, cooked



chia seeds
11g per 2 tbsp



brussel sprouts
6g per cup, cooked



broccoli
5g per cup, cooked



artichoke
7g per 1/2 cup hearts, cooked



sweet potato
8g per cup, cooked



navy beans
12g per cup, cooked



oat bran
6g per cup



pear
4g per fruit



flax meal
4g per 2 tbsp



green beans
4g per cup, cooked



split peas
16g per cup, cooked

NAVIGATION

- Our team is always available to discuss issues related to pain management
- We are committed to your success and outcome and to helping you through this process
- Our multimodal approach has proven very effective for most patients