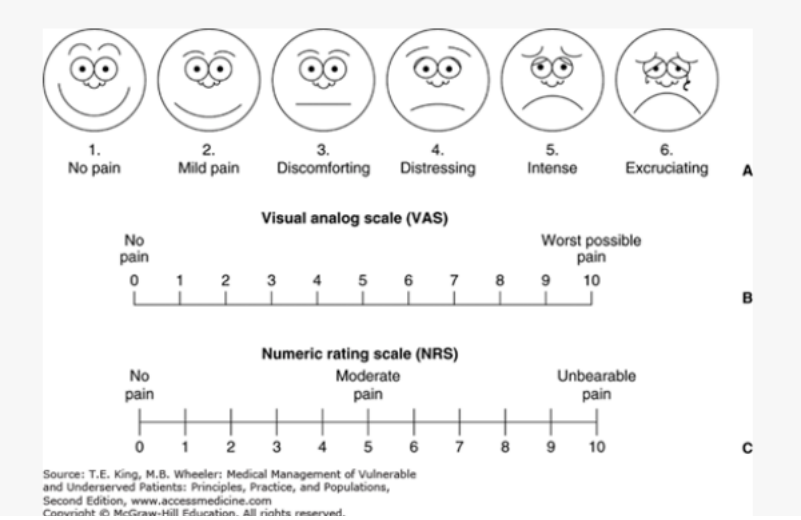
Pain Management

General Approach to Pain Management

A comprehensive pain history is essential to guiding therapy, the goal is to maximize level of functioning and quality of life. To get a good pain history, the important thing is to get a complete history of the events that triggered the pain, ascertain the level of pain, and how the pain interferes with the patients daily functioning and quality of life, and reveiw prior diagnositic evaluations and treatments. most common tool is to rate the pain intensity from 0 to 10, and give a visual scale to show what these look like.



For mild to moderate pain: non opioids and adjuvants are recommended, such as acetaminophen 4g daily, 2-3g is safe in liver disease. NSAIDS: celecoxib is best if increased GIB risk, ketorolac if severe pain (10-15 mg recommended), use with caution in CAD, renal disease, and inflammatory bowel disease.
For moderate to severe pain: schedule non opioid options, try topical medications, then consider short acting opioids PRN.
For severe pain: this requires round the clock opioids. Discuss with the attending, and consider adding extended release meds. Avoid extended release opioids if pain source is expected to resolve, such as a bone fracture, hematoma, abscess, or post procedural pain.

It is important to identify what kind of pain your patient is having.
Somatic or musculoskeletal pain:
is easily localized, sharp, aching, and gnawing. Bony pain can be treated with high dose NSAIDS or steroids. You can consider palliative radiation therapy if cancer related or surgery. For muscle spasms: topical lidocaine, capsaicin, methyl

salicylate-menthol ointment; muscle relaxants such as cyclobenzaprine, baclofen, tizanidine, and watch out for sedation and delirium.
Visceral pain:
is in the deep tissues and internal organs, vauge, referred or difficult to localize. there will be visceral distention such as hepatic capsular stretch from liver mets, and malignant bowel obstruction: it depends on etiology but steroids can be helpful. Can consider plexus block with Chronic Pain
Inflammatory pain:
associated with other signs of inflammation such as welling erythema and warmth. For this NSAIDS (systemic or topical), and steroids will help. Another thing to remember with steroids is that in cancer patients, this may interfere with treatment such as immunotherapy and/or diagnostics. If prolonged course, will need GI and PJP prophylaxis; determine who will manage the taper plan at discharge.
Neuropathic pain:
is burning, stinging, allodynia (pain in response to a normally non painful stimulus), hyperalgsia (exaggerated pain response to a stimulus that is normally painful). To treat this, topical treatments such as caspaicin, camphor/menthol, lidocaine, diclofenac gel can be used. Remember to go low and slow in older adults
Non pharmacologic therapy:
PT/exercise/activity, heat or ice, CBT, treating comorbid psych dx, massage, acupuncture, other integrative therapies

Pharmacologic Agents:

Neuropathic pain and opioid sparing analgesia
a2delta ligands: these are first line options, especially in those with hx of seizure disorders or contraindications to antidepressants. side effects include dizziness, somnolence, and peripheral edema.
Gabapentin: 100 mg PO TID initial dose, titrate inc 100mg tid q3 days, max dose is 3600mg/day, adjust the dose for renal function (look it up)
Pregabalin: 75mg BID or 50 mg TID, titrate can increase by 50-150mg/day within 1 week if tolderating, with a dose range of 300mg/day in 2-3 divided doses, also renal dose adjustment. more easily absorbed
SNRI agents: preferred in patients with comorbid depression or anxiety. adverse effects include nausea, dizziness and fatigue
Duloxetine: 20mg daily, titrate increase by 20-30 mg per week, with max dose of 20-60 mg/day. common side effect includes sweating, and avoiding if creatine clearance is less than 30 ml/min. preferred for painful diabetic polyneuropathy.

venlafaxine: 37.5-75mg daily, titrate increase by 75mg every 4 days, max dose of 225mg day, needs 4-6 weekds for effect; risk of withdrawal syndrome when stopped and needs taper.
TCAs: have the most efficacy but carry anticholinergic side effects such as dry mouth, constipation, and urinary retention and cardiac risks such as qtc prolongation.
amitriptyline: initial dose 25mg at bedtime, 10 mg in frail and elderly, titrate dose every few days, with maximum dose of 25-100mg at bedtime. same with nortryptiline. allow 2-4 weeks for effect, and there are less side effects with nortriptyline

Ketamine
to start ketamine administration, requires Palliative care or chronic pain service. You can consider ketamine if you are 1) expecting severe post operative pain such as abdominal or thoracic surgery, or orthopedic surgeries) 2)opioid tolerant patients presenting for surgery or acute pain exacerbations 3) patients at increased risk of opioid related respiratory depression 4) opioid dependence. The adverse effects are rare at sub anesthetic dosing such as hypertension, tachycardia, arrythymia, hallucinations, increased ICP, increased bronchial secretions, and nausea and vomiting. Psychomimetic effects are effects of drug induced psychological states of psychosis, can be treated with 0.5mg-1mg IV haloperidol or 1-2mg IV lorazepam. You can avoid ketamine in poorly controlled cardiac disease, pregnancy, active psychosis/hospitalizzation history <3 years, severe liver disease, and increased icp/iop

Opioids
Opioid tolerant patient is one who is chronically receiving opioid analgesics on a daily basis and has developed physiologic adaptation requiring higher doses to maintain analgesia. It is defined as total daily dose x 7 days of this opioid equivalents: morphine 60mg daily, oxycodone 30mg daily, hydromorphone 8mg daily, fentanyl 25 mcg/hours. Patients on buprenorphine/methadone for OUD, or active non-rx oud-> treat pain with full agonists if needed. Can consult acceptance and commitment therapy. You can avoid useing combo pills

	Route	Sample Initial PRN Doses* (dose reduce ~50% for elderly)	Onset (min)	Peak Effect (min)	Duration of Effect (hr)	Clearance/Metabolites**
Morphine	IV	2-4mg q3-4h prn	5-10	10-30	3-5	AVOID in renal disease
	PO	7.5-15mg q3-4h prn	15-60	90-120	4	
HYDROmorphone	IV	0.2-0.4mg q3-4h prn	5-20	15-30	3-4	Safer in renal and liver disease
	PO	2-4mg q3-4h prn	15-30	90-120	4-6	
OxyCODONE	PO	5-10mg q3-4h prn	15-30	30-60	4-6	2nd line for renal disease
FentaNYL	IV	25-50mcg q15-30m prn	<1	5-7	45m to 2+ hr	Safer in renal and liver disease
Methadone	IV	*Consult pain and/or pall care*	10-20	60-120	4-6	Safer in renal and liver disease
	PO		30-60	90-120	4-12	

Methadone is beneficial in neuropathic pain, with TID dosing for pain, cannot be converted linearly from other opioids, it has a long half life and can cause qtc prolongation, and takes days to reach steady state. For safety concers, if the patient is febrile, you can reduce the dose, or remove the patch. this is also less effective in cachexia due to lower subcutaneous fat for absortpion, and requires 18-24 hours to reach the therapeutic level. fentanyl patch is safer in both liver and renal dysfunction, you need to intiaite with chronic pain/palliative care consult, and ensure that there is an oupatient prescriber at the discharge.

Opioid uptitration/rotation
if the pain is only moderately controlled with scheduled doses (not in pain crisis, no side effects, you can increase the total daily dose by 3-50%. if taking extended release opioid and needing greater than3-4 rescue doses daily, can increase the extended release dose by 50-100% of total rescue dose used in the past 24 hours. Can rotate the opioids if side effects, and reduce the dose by 25-50% when rotating.
An example:
A patient takes morphine extended release 60mg PO q12h +/- morphine IR 15mg PO BID. First step is to calculate the total daily opioid requirement, and calcuate into morphine equivalents. Then you convert the TDD to equivalent dose of new opioid. the next step is to reduce the dose by 25-50% to accoutn for incomplete cross tolerance, and divide the TDD by number of doses per day. if starting a long acting opioid, divide the TDD into ER doses and add a breakthrough dose that is 10-20% of TDD of ER opioid.

Opioid Equianalgesic Doses		
Drug	**PO (mg)**	**IV (mg)**
Morphine	30	10
OxyCODONE	20	n/a
HYDROcodone	20	n/a
HYDROmorphone	7.5	1.5
FentaNYL*	n/a	0.1 (100 mcg)
Fentanyl patch (mcg/hr)	**Morphine PO (mg/day)**	
25	50	

Pain crisis management:
this is a severe worsening of pain, and while treating, its important to pursue the reasonable diagnostic workup for the etiology. the goal is reduction in pain score by at least 50%. in sickle cell crisis, follow the patients guidance, and acute care plan. If they are opioid naive (remember calculate), give morphine IV 2-5mg or hydromorphone IV 0.2-0.4mg bolus dose. for opioid tolerant, convert usual breakthrough PO dose or 10-20% of total daily extended release dose to IV and administer. You assess the patient for response after 15 minutes, and see their response. if there is no pain relief and no side effects, you increase the dose by 50-100%. if there is minimal relief and no side effects, you repeat the same dose. if the pain is reduced >50% and no side efffects, reassess in 2-3 hours, and use this dose as the new breakthrough dose. side efffects with no pain releief, rotate to different IV opioid.

Patient controlled analgesia
appropriate for patients who are alert and oriented and able to use equipment. Families cannot use PCA by proxy. requires daily delirium assessment. CAM is the confusion assessment method, and has four core features 1) acute onset and fluctuating course of mental status changes 2) inattention 3)disorganized thinking 4)altered level of consciousness. delirium is present when features 1/2 are present, plus either feature 3 or 4. 4at is alertness, attention, abbreviated mental test, acute change in mental status. score greater than 3 is considered positive for possible delirum, 4at is less sensitive but quicker. unrecognized delirum can obscure pain history and or medication use. PCA enables frequent adminsitration of pain meds. general pca for opioid naive, and high risk pca if greater bmi of 40, hx of osa, rass of -2 to -5, and age >65. if the patient is opioid tolerant, requries basal; rate, consult palliative care/pain. increases in basal rate takes 12 hours to reach steady state: adjust basal rate q24 hours. if nightime awakining of pain, can increase in basal rate at night

General Opioid-Naïve PCA Dosing		
	Morphine	Hydromorphone
Patient Administered Dose	1.5mg	0.2mg
Lockout Interval (per min)	10-15min	10-15min
One-Hour Dose Limit	6mg	1.4mg
RN/Clinician Bolus (for breakthrough)	2mg q30min PRN	0.3mg q20min PRN
Continuous Infusion Rate	0mg/hr	0mg/hr

Adverse effects of opioid and management
Respiratory depression: follows sedative effects. You can hold opioid, consider low dose naloxone but be careful if on high dose extended relesae opioids. the management for this is dilute 0.4mg naloxone in 9 ml saline, give 1-2 ml q2min until increase in respiratory rate or mental status improves. naloxone half life is 30-120 mintues, watch for recurrence of respiratory depression, and consider naloxone gtt, all patients d/c on opioid need a naloxone script.
constipation: always start standing senna and or miralax when intiating opioids, use other laxatives if needed; methylnaltrexone qod if failed laxative therapy (but can cause severe nausea/cramping; avoid if concern for gi obstfuction)
opioid induced hyperalgesia: generally seen with high doses (or lower doses in chronic kidney disease), consider roating oppioids and involving palliative care
myoclonus: reduce dose or rotate opioid, increase hydration; can give low dose benzodiazepine, baclofen, or gabapentin. if persists/ consult palliateive care
nasusea/vomiting: start prochlorperazine, metoclopramide, haloperidonl or low dose naloxone gtt: avoid ondasetron
pruritis: mediated by mu receptor (not histamine - benadryl ineffective unless rash or allergic reaciton; consider opioid roattion, ondsetron, nalbuphine 5mg iv q6h or low dose naloxone gtt
sedation: occurs prior to respiratory depression, consider cns stimulant such as dextroamphetamine, methylphenidate although rarely prsecribed
delirium: reudce dose or rotate opioid; iv haldol 1-2.5 mg BID-QID or IV/po zyprexa 2.5-5mg po qd-bid