

THIS PATIENT'S ON FIRE!
Stop, Drop and Roll Out Effective Medication Interventions!

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Learning Objectives - Pharmacists

1. List the most prevalent uncontrolled symptoms that keep patients with advanced illness from achieving their goals of care.
2. For each symptom, describe pre-emptive and management strategies.
3. For each symptom, describe best practices in educating patients and informal caregivers (families) on medication management.

Learning Objectives – Pharmacy Technicians

1. List the most prevalent uncontrolled symptoms that keep patients with advanced illness from achieving their goals of care.
2. For each symptom, recognize commonly employed management strategies
3. Describe the best practices in communicating with patients and caregivers, recognizing when concerns should be referred to the pharmacist for review.

Green - Yellow - Red

- **Green patient** - Current interventions are effectively managing the patient's condition and/or support needs.
- **Yellow patient** - Indicates a recently changed condition that requires feedback or additional interdisciplinary input.
- **Red patient** - Indicates a complex patient condition or situation requiring an in-depth discussion and may include, but is not limited to.



Characterizing Care of Hospice Patients in the Hospital

- Frequency of reasons for unplanned admissions to hospital
 - Delirium - 36%
 - Pain - 30%
 - Dyspnea - 9%
 - Nausea - 6%
 - Constipation!



J Palliat Med 2011;14(2):185-189.

PAIN! It's an emergency!!

- What is pain? Is this a "one size fits all" experience?
- Why might a patient with serious illness have pain?
- Is the pain acute or chronic? Or both?
- Is the pain intermittent, persistent, or breakthrough?
- What's the pathogenesis of the pain?
- Pain assessment
- Which analgesic?
- What dose? How quickly can I increase that dose?
- What about co-analgesics (adjuvants)?



Treatment Options



"Divine is the task to relieve pain."
-Hippocrates

- Non-pharmacologic
 - Positioning, physical manipulation, acupuncture
 - Cold/heat, psychosocial, biofeedback, relaxation, aroma/pet/music/art therapy
- Nociceptive pain (excluding bone pain → steroid or NSAID)
 - Mild pain (1-3) → acetaminophen or NSAID
 - Moderate pain (4-6) → combination (oxycodone/acetaminophen), low dose opioid (morphine, hydromorphone, oxycodone), tramadol
 - Severe pain (7-10) → opioid (morphine vs. the rest of the pack?)
 - What about transdermal buprenorphine or fentanyl?

Treatment Options - Neuropathic



"Divine is the task to relieve pain."
-Hippocrates

- Traditional analgesics?
 - Acetaminophen/NSAIDs? Tramadol? Methadone?
- Cord compression, intracranial pressure, visceral distention
 - Corticosteroid (dexamethasone, prednisone, methylprednisolone, prednisolone)
- Localized neuropathic pain
 - Topical capsaicin, lidocaine gel or transdermal patch
- Co-analgesics
 - Antidepressants - tricyclic antidepressants (nortriptyline, desipramine)
 - If depressed - consider duloxetine or venlafaxine
 - Anticonvulsants - carbamazepine, gabapentin, valproic acid

Why Dex?

Name	Equivalent Dose (mg)	Glucocorticoid Potency (anti-inflam)	Mineralocorticoid Potency (Na retention)	Duration of actions (T 1/2 hrs)
Hydrocortisone	20	1	1	8
Prednisone	5	3.5-5	0.8	16-36
Prednisolone	5	4	0.8	16/36
Methylprednisolone	4	5-7.5	0.5	18-40
Dexamethasone	0.75	25-80	0	36-54

Pharmacokinetics of IR Opioids

Solubility	IR Opioids	Onset of analgesia	Duration of effect
Hydrophilic ↑ ↓ Lipophilic	Morphine (oral)	30-40 minutes	4 hours
	Oxycodone (oral)	30 minutes	4 hours
	Oxymorphone (oral)	30 minutes	4-6 hours
	Hydromorphone (oral)	30 minutes	4 hours
	Methadone (oral)	10-15 minutes	4-8 hours
Lipophilic	Fentanyl (transmucosal)	5-10 minutes	1-2 hours

Bennett D, et al. P&T 2005;30:354-361.

Dose of Rescue Opioid

- ONE dose of rescue opioid (e.g., oxycodone, oxymorphone, morphine) should be 10-15% of the TOTAL daily dose of oral long-acting opioid.
 - MS Contin 30 mg q12h
 - TDD = 60 mg
 - 10% - 6 mg; 15% - 9 mg
 - MSIR 5 or 10 mg q2h prn breakthrough pain
- Rate pain before and after rescue opioid

This pain is on FIRE! Acute severe pain in opioid-naive

- Pathologic fracture or nerve compression (zoom, zoom)
- Cleveland Clinic guidelines
 - Morphine 1 mg IV every minute x 10 minutes; 5 minute respite; repeat x 2
 - Fentanyl 20 mcg or hydromorphone 0.2 mg
 - Physician MUST be bedside monitoring sensorium and pain
 - Goal: until pain is "controlled" - 2-4 point drop in pain rating. DOSE STACKING!
 - Subcutaneous administration - morphine 2 mg every 5 minutes until pain managed
 - Fentanyl 40 mcg or hydromorphone 0.4 mg
 - Oral morphine 5 mg every 30 minutes until pain managed
 - 1 mg oral hydromorphone or 5 mg oral oxycodone

Opioid Dosage Escalation Strategies

- For moderate to severe pain, increase opioid TDD by 50-100%, regardless of starting dose.
- For mild-moderate pain, increase opioid TDD by 25-50%, regardless of starting dose.
- BUT USE COMMON SENSE! Phone a friend!
 - Morphine \geq 20 mg/hour parenteral infusion
 - Hydromorphone \geq 5 mg/hour parenteral infusion
 - Would ketamine be useful?
- Short-acting, immediate-release single-ingredient oral opioids (morphine, oxycodone, hydromorphone) can be safely dose-escalated every 2 hours.
- Long-acting, sustained-release oral opioids can be increased every 24 hours (this does not include TDF or methadone).

TDD = total daily dose

What's wrong with this order?

- Start an IV infusion of morphine at 2 mg/hour; RN may titrate to comfort



"Titrate to Comfort" is not a good look

- Half-life of morphine
 - General population 2-3 hours
 - Pediatrics 2-9 hours
 - Liver impairment 8 or more hours

Number t ½	% of Steady State Achieved	2 hour t ½	3 hour t ½	4 hour t ½	8 hour t ½
1	50	2	3	4	8
2	75	4	6	8	16
3	87.5	6	9	12	24
4	93.75	8	12	16	32
5	96.875	10	15	20	40

J Pall Med 2007;10(6):1369-1394; Micromedex 2016

“Titrate to Comfort” is not a good look

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- More aggressive – increase continuous infusion in 8-12 hours

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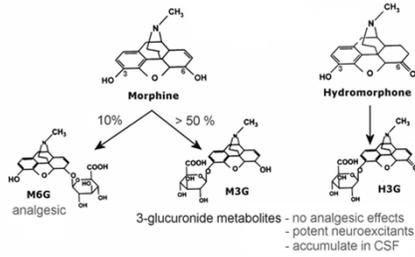
- Most aggressive – increase continuous infusion in 8-12 hours
- More conservative – increase continuous infusion in 12-24 hours

Patient Says – Provider Sees – What the heck IS this?

What the patient says...	What the provider sees.
Increased sensitivity to pain stimulus (hyperalgesia)	Any dose of an opioid, but particularly with high-dose morphine or hydromorphone, and in renal impairment/failure
Worsening pain despite increasing doses of opioids	Pain elicited from ordinary nonpainful stimuli (e.g., stroking skin with cotton [allodynia])
Pain that becomes more diffuse, extending beyond the distribution of the pre-existing pain	Presence of other manifestations of opioid-induced hyperexcitability: myoclonus, delirium, seizures

J Clin Oncol 2007;15:1564-1565

Morphine and Hydromorphone
Active Metabolite Accumulation in Renal Failure



<http://palliative.info/pages/TeachingMaterial.htm>

Management of Opioid-Induced Hyperalgesia

- Hydration if clinically appropriate
- Reduce the opioid dose
 - Consider use of an opioid-sparing coanalgesic
 - Acetaminophen, NSAID
- Opioid rotation
 - Allows comparable analgesia at a lower equianalgesic dose
 - Fentanyl
 - Methadone
 - NMDA receptor antagonist
- Ketamine (NMDA receptor antagonist)

Dyspnea

- Air hunger; a distressing symptom described as a feeling of breathlessness and/or a sensation of smothering.
- An uncomfortable awareness of breathing
- Subjective complaint
- Very common in advanced illness; distressing for patient and family



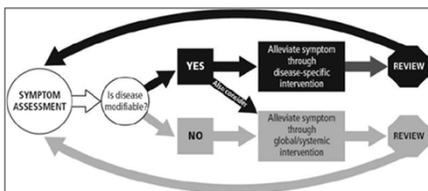


FIG. 1. Biopsychosocial model of dyspnea management.

Kamal et al. J Pall Med 2012;15(1):106-114

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Management of dyspnea

- Non-pharmacologic interventions
 - Air circulation (fan moving air over patient's face)
 - Breathing exercises
 - Limit strenuous activities
 - Reconsider IV fluids
 - Positioning
 - Relaxation techniques
- Pharmacotherapy
 - Consider reversible etiology (infection, heart failure, COPD, pain, etc.)



Opioids for Dyspnea

- Most studied and used class of drugs
 - Shown to relieve dyspnea in opioid-naïve patients with COPD during treadmill exercise; reversed by naloxone
 - Three fold increase in endogenous opioids from rest to end-exercise
- Oral morphine (or parenteral; nebulized does not help)
 - Dose for dyspnea ≥ dose for breakthrough pain
- Hydromorphone – relief seen with 2.5 mg every 6 hours
- Fentanyl
 - Small case series with nebulized fentanyl show promise
 - Efficacy seen with oral transmucosal fentanyl
- Methadone – not effective for dyspnea ☹️

Morphine for Dyspnea

- Studied in oral, parenteral and nebulized forms
- Statistically significant improvement seen with oral and parenteral opioids only
- Abernethy et al. enrolled 48 patients with COPD, opioid-naïve
 - 4 days 20 mg once daily morphine followed by 4 days of placebo (cross-over trial)
 - Significant benefits in morphine arm

Abernethy AP et al. BMJ 2003;327:523-528.

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Morphine for Dyspnea

- Currow et al. completed a “minimum effective daily dose for opioids” dyspnea trial
- SR morphine, starting at 10 mg po qd
- In 65% of patients, opioids reduced dyspnea by at least 10%
 - NNT was 1.5
- For 70% of patients, the beneficial dose was 10 mg per day, and sustained benefit seen for three months in 53% patients

Currow DC et al. J Pain Symptom Manage 2011;42:388-389.

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Anxiolytics (BZD and SSRIs)

- Patients with anxiety report more dyspnea (?)
- Dyspnea likes to run with anxiety and depression
- Studies with diazepam, clorazepate, alprazolam have not shown benefit compared to placebo

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Midazolam and Dyspnea

- Navigante et al. compared morphine vs. midazolam vs. morphine + midazolam
 - Advanced cancer patients with life expectancy < 1 week (30% of patients in each arm died during the study)
 - Modest benefit seen with the addition of the BZD to morphine
 - Difficult to generalize to the majority of the palliative care population
- Benzodiazepines unlikely to be initial drug of choice
 - Possibly in clear anxiety-induced cases

Navigante AH et al. J Pain Symptom Manage 2006;31:38-47

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Inhaled Furosemide and Oxygen

- Nebulized furosemide
 - Inhibits cough reflex, preventive effect on bronchoconstriction in asthma, indirect action on sensory nerve endings in the airway epithelium
 - Studied in COPD patients saw improvement in dyspnea compared to placebo
 - Double-blind study of 15 lung CA patients - no statistical superiority

Ong KC et al. Am J Respir Crit Care Med 2004;169:1028-1033
Stone P et al. Palliat Med 1994;8:258.

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Oxygen

- COPD patients - oxygen demonstrated both survival and QOL advantages in the presence of significant hypoxemia
- Conflicting results in cancer dyspnea
- Abernethy et al. compared palliative oxygen vs. medical air for nonhypoxemia patients.
 - Neither gas demonstrated superiority in improving QOL or relieving sensation of breathlessness
 - Patients in both arms reported dyspnea and QOL of life improvement (moving air?)
- More O2 not necessarily helpful; 90% O2 saturation sufficient!

Abernethy AP et al. Lancet 2010;376:784-793.

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Show-Down: O₂ vs. Opioid

- German palliative care unit
- 46 terminally ill patients with baseline hypoxemia or normoxemia but without uncontrolled symptoms
- 4 L supplemental oxygen via nasal cannula vs. titrated basal opioids, with the option for breakthrough opioids for symptoms relief.
- Opioids more likely to have dyspnea intensity reduced; no benefit of oxygen at rest.

Clemens KE et al. Support Care Cancer 2009;17:367-377.

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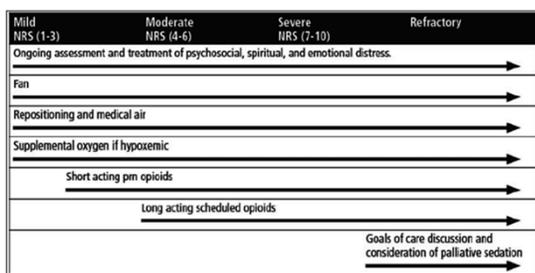


FIG. 2. Global therapies for dyspnea management.

Kamal et al. J Pall Med 2012;15(1):106-114

Intervention	Agent	Conclusions
Medical Gas	Oxygen – Hypoxemic	↑
	Oxygen – Normoxemic	↔
	Medical air – Normoxemic	↔ or †
Pharmacologic	Opioids – oral/IV	↑
	Opioids - inhaled	↓
	Inhaled furosemide	↔
	Anxiolytics	↔
	Heliox	↔
Non-pharmacologic	Fan	↑
	Pulmonary rehabilitation (in select patients)	↑
Surgical	Pleural catheter	↑
	LVRS (in select patients)	↑
	Bronchial stenting (in select patients)	↑
Complementary	Acupuncture	↔ or †

Kamal et al. J Pall Med 2012;15(1):106-114

† Evidence generally supports use of intervention
 ↓ Current evidence does not support use
 ↔ Further investigation required
 ↔ or † Further investigation is required, but emerging data are compelling to support use

FIG. 3. Treatment options for dyspnea.

Typical hospice patient – Heart Failure and COPD

- Sacubitril/valsartan (Entresto®)
- Furosemide and potassium chloride
- Eplerenone (Inspra®)
- Ranolazine (Ranexa®)—newly added
- Aspirin
- Atorvastatin
- Folic acid and multivitamin
- Roflumilast (Daliresp®)
- Montelukast (Singulair®)
- Fluticasone/Salmeterol (Advair Diskus®) 250/50 inhaler
- Albuterol (Ventolin®) PRN
- Levalbuterol (Xopenex®) PRN
- Budesonide/Formoterol (Symbicort®)
- Budesonide (Pulmicort flexhaler®)
- Tiotropium (Spiriva®) inhaler

Management of COPD

- Does the patient really need all that duplicate therapy?
- Can the patient USE all those devices correctly?
- Alternative:
 - Oral corticosteroid – prednisone or dexamethasone
 - Nebulized ipratropium + albuterol (DuoNeb®) every 4 hours while awake (at least four times daily)
- But shouldn't we have something for rescue dyspnea? Scary symptom

Delirium / Agitation

- **Delirium** – an acute and transient, fluctuating disturbance in the level of consciousness or mental state resulting in deficits of attention, cognition, and perception.
 - May be hyperactive, hypoactive, or mixed
 - Could be drug-induced (anticholinergics, benzodiazepines, steroids, opioids)
- **Agitation** – a symptom that occurs as a result of a variety of medical and psychiatric conditions. Can manifest as:
 - Mental tension, a psychiatric condition, physical and emotional discomfort
 - Excessive physical distress and hyperactivity that may interfere with the safety of patient and staff
 - Combativeness, increased motor activity, striking out
 - May see acute psychosis – hallucinations, delusions, catatonia

Delirium Treatment

- Non-pharmacological
 - Quiet supportive environment
 - Consistent/familiar environment
 - Brightly lit room
 - Limited visitors
 - Avoid overstimulation
 - Orientation (clock, calendar)
 - Basic fluid balance and nutrition
 - Avoid restriction of movement (restraints, catheters, IV lines)
 - Visual and hearing aids, if appropriate
 - Avoid sleep disruptions/facilitate sleep hygiene



Frederich, ME. Nonpain symptom management. *Palliative Care*. 2001;28(2):299-316.
 Breitbart W, Bruera E, Chochinov H, et al. Neuropsychiatric syndromes and psychological symptoms in patients with advanced cancer. *Journal of Pain and Symptom Management*. 1995;10(2):131-41.
 Breitbart W and Alici V. Agitation and delirium at the end of life: "we couldn't manage him". *JAMA*. 2008;300(24):2998-2910.

Medications to Avoid in People at Risk for Delirium

- | | |
|--------------------------------|--------------------------------------|
| • Neuroleptics | • Antimuscarinics (anticholinergics) |
| • Opioids | • Tricyclic antidepressants |
| • Benzodiazepines | • Antiparkinson medications |
| • Antihistamine H1 antagonists | • Digoxin |
| • Histamine H2 antagonists | • Steroids |
| • Dihydropyridines | • NSAIDs |

Age and Ageing 2011;40:23-29

Drug-Induced Delirium

- Opioids
- Benzodiazepines
- DOUBLE to TRIPLE risk of delirium



Age Ageing 2011;40:23-9.

Delirium Treatment

- Treat identified underlying causes
 - Brain metastases: radiation therapy, dexamethasone
 - Organ failure: dialysis, lactulose
 - Dehydration
 - Infections
 - Sensory deficits
 - Metabolic derangements: hydration, furosemide, pamidronate
 - Suspect if confusion co-occurs with N/V/C and weakness
 - SIADH: fluid restriction, demeclocycline

Frederich, ME. Nonpain symptom management. *Palliative Care*. 2001;28(2):299-316.

Delirium Management: Antipsychotics

- Haloperidol (Haldol®) - *drug of choice*
 - Low doses are typically effective (1-3mg/d)
 - Dose 0.5-2mg every 2-12 hours
 - Usually managed orally; can be given SC, IV, IM
- Risperidone (Risperdal®)
 - Dose: 0.25-1 every 12-24 hours; Available by mouth only
 - No difference in efficacy from haloperidol
- Quetiapine (Seroquel®)
 - Dose: 25 mg po BID; up to 200 mg daily
 - Often prescribed as a sleeping agent



Breitbart 2008; Casarett 2001; Trzepacz 1999

Anxiolytics vs. Antipsychotics

- Anxiety vs. delirium/confusion
- Anxiolytics (lorazepam, alprazolam) make delirium WORSE!
- Useful to treat alcohol withdrawal
- AVOID as first line therapy for all other reversible causes of delirium
 - More likely to cause further disinhibition rather than sedation in this state and in geriatric population
- Low-dose lorazepam may be used in ADDITION to antipsychotic medication with antipsychotic insufficient

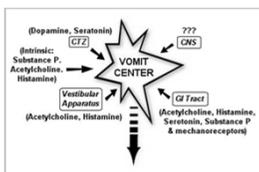
Nausea and Vomiting

- Nausea – an unpleasant sensation felt before vomiting (or making you wish you could vomit)
- Retching – follows nausea; spasmodic movement of abdominal muscles, diaphragm and chest wall
- Vomiting – forceful evacuation of stomach contents through oral or nasal cavity.
- N/V – distressing to patients; compromises QOL



Those tricky neurotransmitters VOMIT

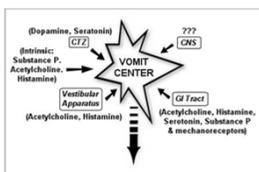
- **Vestibular**
 - Cholinergic, histaminic
 - Anticholinergic/antihistaminic (promethazine)
- **Obstruction** of bowel due to constipation
 - Cholinergic, histaminic, serotonin (5-HT3)
 - Fix the bowels (stimulate myenteric plexus → senna)
- **Drug DysMotility** of the upper gut
 - Cholinergic, histaminic, 5-HT3, 5-HT4
 - Prokinetic medications that stimulate 5-HT4 (metoclopramide)



James Hallenbeck, Palliative Care Perspectives

Those tricky neurotransmitters VOMIT

- **Infection, Inflammation**
 - Cholinergic, histaminic, 5-HT3, neurokinin-1
 - Promethazine, NK1 antagonist (aprepitant)
- **Toxins** that stimulate CTZ (e.g., opioids)
 - Dopamine, 5-HT3
 - Antidopaminergic agents (haloperidol, prochlorperazine)
 - Possibly 5-HT3 inhibitors (ondansetron)



James Hallenbeck, Palliative Care Perspectives

HOSPICE PRAYER



Happy is the patient in the PM, who has a BM in the AM

Laxative	Usual Adult Dose	Onset	Side Effects
Bulk-Forming Laxatives			
Psyllium	Up to 1 tablespoon (~3.5 grams fiber) three times daily	12-72 hours	Impaction above strictures, fluid overload, gas and bloating
Methylcellulose	Up to 1 tablespoon (~2 grams fiber) or 4 caplets (500 mg fiber/caplet) three times daily	12-72 hours	
Polycarbophil	2-4 tabs (500 mg per tab) per day	24-48 hours	
Wheat dextrin	1-3 caplets (1 grams fiber/caplet) or 2 tsp (1.5 gram fiber/tsp) up to 3 times per day	24-48 hours	

NOT a good option for opioid-induced constipation. Makes it WORSE! Cover your eyes!

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Laxative	Usual Adult Dose	Onset of Action	Side Effects
Surfactants (softeners)			
Docusate sodium	100 mg two times per day	24-72 hours	Well tolerated. Use lower dose if administered with another laxative. Contact dermatitis reported.
Docusate calcium	240 mg once daily	24-72 hours	
Stimulant Laxatives			
Bisacodyl	10-30 mg as enteric coated tabs 1 time a day	6-10 hours	Gastric irritation
Bisacodyl	10 mg pr 1 time a day	15-60 minutes	Rectal irritation
Senna	2-4 tabs (8.6 mg sennosides/tab) or 1-2 tabs (15 mg sennosides/tab) as a single dose or divided twice daily	6-12 hours	Melanosis coli

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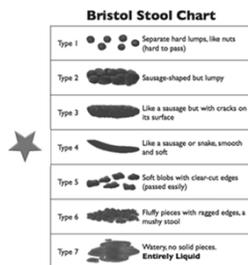
Docusate + Senna: Too Good To Be True?

- 2013 randomized, double-blind, placebo-controlled trial
- All were hospice patients receiving daily opioids
- 74 patients randomized to receive either docusate and sennosides OR placebo and sennosides
 - 200 mg docusate BID + 1-3 senna tablets, one to three times daily
 - Placebo + 1-3 senna tablets, one to three times daily
- No significant between-group differences in stool frequency, volume, or consistency; or difficulty or completeness of evacuation.

Tarumi Y, et al. *J Pain Symptom Manage.* 2013;45(1):2-13.

Docusate + Senna: Too Good To Be True?

- More patients in the placebo group have Type 4 (smooth and soft) and Type 5 (soft blobs) stool
- More patients in the docusate group had Type 3 (sausage like) and Type 6 (mushy) stool



Tarumi Y, et al. *J Pain Symptom Manage.* 2013;45(1):2-13.

SENNA WITH AND WITHOUT DOCUSATE HOSPITALIZED CANCER PATIENTS

Senna Only Protocol

- Senna, 1 po qd
- After 48 hours, increase to Senna 1 po bid
- After 24 hours, increase to Senna 1 po tid
- After 24 hours, increase to Senna 2 po tid

Senna plus Docusate Protocol

- Docusate 200 mg po bid, or Docusate 200 mg po bid plus Senna 1 po qd
- After 48 hours, increase to docusate 200 mg po tid, senna 1 po bid
- After 24 hours, increase docusate 200 mg po tid plus senna 1 po tid
- After 24 hours, increase to docusate 200 mg po tid plus senna 2 po tid

J Pall Med 2008;11(4):575-581

Laxative	Usual Adult Dose	Onset of Action	Side Effects
Osmotic Agents			
Polyethylene glycol	8.5 to 34 grams in 240 ml (8 oz) liquids	1-4 days	Nausea, bloating, cramping
Lactulose	10-20 grams (15-30 ml) qod (up to bid)	24-48 hours	Abdominal bloating, flatulence
Sorbitol	30 grams (120 mg of 25% solution) once daily	24-48 hours	Abdominal bloating, flatulence
Glycerin	One pr (2-3 grams) for 15 minutes once daily	15-60 minutes	Rectal irritation
Magnesium citrate	200 ml (11.6 grams) once per day	0.5-3 hours	Watery stools and urgency. Caution with renal insufficiency.
Magnesium hydroxide	5-15 ml as needed up to 4 times daily	0.5-6 hours	
Magnesium sulfate	1-2 tsp (5-10 grams) in 240 ml water once daily	0.5-3 hours	

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Laxative	Usual Adult Dose	Onset of Action	Side Effects
Enemas			
Docusate	283 mg docusate sodium, PEG and glycerin		
Sodium phosphate	7 g dibasic and 19 g monobasic sodium phosphate Adults - 118 ml; Children 2-12 years - 59 ml		
Bisacodyl	10 mg per 30 ml		
Mineral oil	Adults and children ≥ 12 years - 118 ml; Children 2-12 years - 59 ml		
Enemeez (Plus), others	Docusate, PEG, glycerin, benzocaine		

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Opioid-Induced Constipation (Hospice)

- History of colicky abdominal pain, IBS, hepatic primary or mets, confusion or encephalopathy with constipation?
 - Yes, but nauseated - sorbitol
 - Yes, no nausea present - lactulose
- If no history of above, institute standard bowel protocol
 - Laxative (Senna 2 tabs qhs; titrate up to 8 tabs qd), or
 - Polyethylene glycol, 1 scoop per day

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Opioid-Induced Constipation (Hospice)

- Add additional agents as needed
 - Dulcolax
 - Magnesium
 - Evaluate for ileus
- Low impaction
 - Manually disimpact plus enema
- High impaction??



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Fecal Impaction

- Fecal impaction / incontinence
- Key to diagnosis is copious amount of stool in rectum
 - Proximal rectum or sigmoid colon
 - Digital rectal examination may be nondiagnostic
 - May require abdominal radiograph
- In the absence of suspected perforation or massive bleeding, management involves digital disimpaction and colon evacuation
 - Warm-water enema with mineral oil
 - Soap-suds enema

Laxatives: How much is that BM gonna cost?

- Cost of 30 days of common doses of commonly used laxatives
 - Senna 8.6 mg (100 tablets) \$21.04
 - 2 tablets by mouth twice daily = \$25.48
 - Docusate-senna 50mg-8.6 mg (100 tablets) \$18.13
 - 2 tablets by mouth twice daily = \$21.76
 - Polyethylene glycol (510 grams) \$9.40
 - 17 grams by mouth once daily = \$9.40
- Well tolerated, readily available
- ~ 50% efficacy; not target-specific therapy

Lexicomp Online®, Lexi-Drugs®, Hudson, Ohio; Lexi-Comp, Inc.; April 22, 2016.

Laxative	Usual Adult Dose	Onset of Action	Side Effects
Other			
Lubiprostone	24 micrograms 2 times per day	24-48 hours	Nausea, diarrhea
Linaclotide	145 micrograms once daily	12-24 hours	Diarrhea, bloating
PAMORA's (Peripherally acting mu opioid antagonists)			
Methylnaltrexone (Relistor)	SQ 8-12 mg every other day	4-24 hours	Abdominal pain, diarrhea, nausea, dizziness
Naloxegol (Movantik)	25 mg po every morning	< 2 hours	Abdominal pain, nausea, diarrhea, headache, back pain

NNT - cost

Agent	Dose	NNT	Cost
Lubiprostone PO	24 mcg bid	13	\$350/month
Methylnaltrexone SQ	12 mcg qd/qod	3	\$120/dose
Methylnaltrexone PO	450 mg daily	8	\$1,500/month
Naloxegol PO	25 mcg daily	8	\$300

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THIS PATIENT'S ON FIRE!
Stop, Drop and Roll Out Effective Medication Interventions!

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