Symptom Management Tips in Hemodialysis Patients

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Renal Pharmacists Network
Nephrology Education Day
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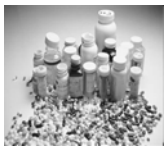
No conflict of interest to declare

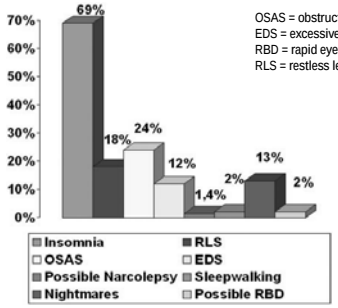
Learning Objectives

- Review pharmacological treatment and management algorithm for …
  - Insomnia
  - Pruritus
  - Pain



Insomnia

Prevalence



OSAS = obstructive sleep apnea syndrome
EDS = excessive daytime sleepiness
RBD = rapid eye movement behavior disorder
RLS = restless leg syndrome

Merlino G et al. NDT 2006;21:184-90.

Consequences

- Excessive daytime sleepiness
- Associated with
  - decreased quality of life
  - increased morbidity
  - increased hospitalization
  - increased mortality

Novak M et al. Sem Dial 2006;19:25-31
Kosmadakis GC. Int J Artif Organs 2008;31:919-27

Contributing Factors

Pathophysiologic
- Acid-base disorders
- Electrolyte disturbances
- Iron deficiency
- Uremic toxins
- Renal anemia
- Renal neuropathy
- Altered melatonin metabolism

Others:
- Alcohol and caffeine
- Smoking

Psychologic
- Mood disorders
- Anxiety
- Sexual problems
- Psychosocial problems

Lifestyle-related
- Sedentary lifestyle
- Napping during dialysis
- Getting up too early for HD

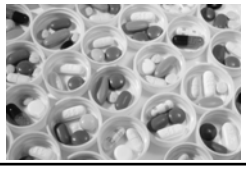
Novak M et al. Sem Dial 2006;19:25-31

Good Sleep Hygiene

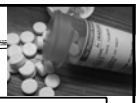
- Maintain regular schedule for bedtime and awakening
- Avoid daytime naps or going to bed too early in evening
- Avoid caffeine, nicotine, alcohol, heavy meals, chocolate, excessive sugar or fluid before bedtime
- Exercise regularly during the day but avoid vigorous exercise within 3 hrs of bedtime
- Minimize noise, light & extreme temp in bedroom
- Develop relaxing bedtime rituals, e.g. reading, music
- Get the clock out of visible range to avoid clock watching
- Go to bed only when sleepy
- Get out of bed if unable to sleep within 20 minutes. Return when sleepy

Novak M et al. Sem Dial 2006;19:25-31
http://phc.eduhealth.ca/PHC_PDFs/FM/FM.900.St82.PHC.pdf

Pharmacotherapy of Insomnia



Benzodiazepines



	Half life (hr)	Dose	Adverse Effects	Drug Interactions
Short – for early insomnia – onset 15-30 min ** NOT recommended **				
Triazolam	2-5	0.125-0.25 mg	Amnesia, rebound Drowsiness, dizziness, incoordination	No active metabolite; Metabolized by CYP 3A4
Intermediate – for sleep-maintenance insomnia – onset 1-2 hrs				
Lorazepam	10-20	0.5-2 mg	Amnesia, drowsiness, dizziness, incoordination	No active metabolite; Glucuronidation
Oxazepam	5-20	10-30 mg		No active metabolite; Glucuronidation
Temazepam	9.5-12	15-30 mg		No active metabolite; Glucuronidation
Long – ** NOT recommended **				
Diazepam	20-50	2-5 mg	Amnesia, drowsiness, dizziness, incoordination	Active metabolites;
Flurazepam	40-114	15-30 mg		Active metabolites; CYP 3A4/2D6

Estivill E et al. Clin Drug Invest 2003;23:351-85

Non-benzodiazepine GABA agonists

	Zopiclone	Zolpidem	Zaleplon*
Onset	*30-60 min*	*30 min*	*15-30 min*
Duration	*5-8 hrs*	*6-8 hrs*	*2-4 hrs*
Elimination $t_{1/2}$	*~5 hrs*	*2.5-3 hrs*	*1 hr*
Indications	*Early and middle insomnia*	*Early and middle insomnia*	*Early insomnia*
Dosing	*5-10mg*	*10mg (If ≤ 4 hr sleep left 1.75mg♀;3.5mg ♂)*	*7.5-15 mg*
Dosing in Elderly	*3.75-5mg*	*5mg**	*5 mg*
Metabolism	*CYP 3A4*	*CYP 3A4*	*Aldehyde oxidase*

*available in US only

Bain KT Am J Geriatr Pharmacother 2006;4:168-92

Complex Sleep-Related Behaviors

- e.g. sleep-driving, making phone calls, preparing & eating food while asleep
- No recollection of event
- 90% had some alcohol prior

Sedating Antidepressants

Trazodone

- Usual initial dose: 25-50 mg po HS
- Commonly used in antidepressant-induced insomnia, pts +/- depression
- Adverse effects: orthostatic hypotension, blurred vision, atrial & ventricular arrhythmias, priapism, risk of serotonin syndrome

Tricyclic antidepressants

- e.g. doxepin, amitriptyline
- Inappropriate for elderly
- Adverse effects: anticholinergic effects, orthostatic hypotension, weight gain, cardiac arrhythmias, increased risk of falls

Mirtazepine

- Adverse effects: weight gain, anticholinergic effects

Sedating Antipsychotics

- e.g. methotrimeprazine, chlorpromazine, olanzapine, quetiapine
- Studies demonstrating the usefulness of these medications for either short- or long-term management of insomnia are lacking
- Not recommended due to risk of long term side effects

Sedating Antihistamines

Diphenhydramine or doxylamine

- Inappropriate for elderly
  - Anticholinergic effects, increased risk of falls
- Tolerance after 1-2 wks of continuous use
- No systematic evidence for efficacy and there are significant concerns about risks of these medications.

http://consensus.nih.gov; Bain KT. Am J Geriatr Pharmacother 2006;4:168-92

Herbal Supplements

- Lack of regulation
  - Large variations in formulation, purity & potency
- Valerian (*Valeriana officinalis*)
- Kava kava (*Piper methysticum*)
  - Safety data limited; case reports of hepatotoxicity in persons taking herbal products containing these

http://naturalstandard.com

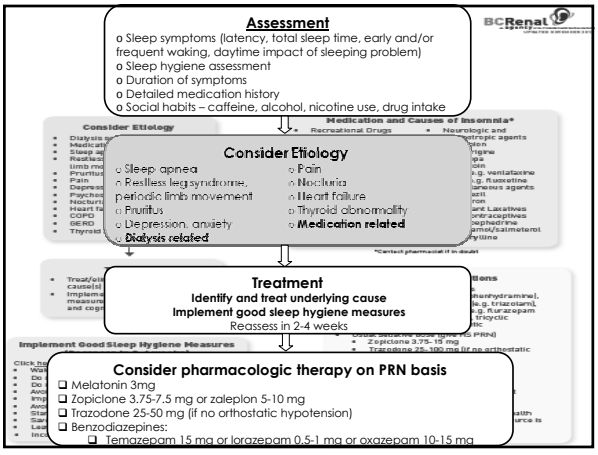
Melatonin

- Natural hormone produced by the pineal gland
- Little evidence exists for efficacy in the treatment of insomnia or its appropriate dosage, time of administration, toxicity and limited to short term
- 1 DB, PC, x-over study in 24 HD pts using 3mg po HS x 6 wks showed ↓ sleep latency and ↑ sleep efficiency

L-Trytophan

- Extremely limited evidence supporting its use
- Concerns with possible toxic effects, esp. in combination with certain psychiatric medications

Estivill E et al. Clin Drug Invest 2003;23:351-85
Koch BC et al. Br J Clin Pharmacol 2009;67:68-75



Medication causes of insomnia

- Recreational Drugs
  - Alcohol
  - Caffeine
  - Nicotine
  - Amphetamines and Methamphetamines
  - Drug withdrawal
- Cardiovascular agents
  - Diuretics
  - Beta blockers
- Endocrine agents
  - Corticosteroids
  - Thyroid hormone
- Stimulants
  - Methylphenidate
  - Dextroamphetamine
- Neurologic and psychotropic agents
  - Levodopa
  - Phenytoin
  - Lamotrigine
  - Bupropion
  - SSRI, e.g. fluoxetine
  - SNRI, e.g. venlafaxine
- Miscellaneous agents
  - Theophylline
  - Oral Contraceptives
  - Cimetidine
  - Pseudoephedrine
  - Stimulant Laxatives
  - Interferon
  - Donepezil

Restless Leg Syndrome (RLS)

RLS Medication Options

- **Dopamine precursor**
  - Levodopa/carbidopa 100mg/25mg to 200mg/50mg po HS
  - Risk of augmentation, nausea, orthostatic hypotension
- **Dopamine agonists**
  - Decreased risk for augmentation
  - Increased incidence of hypotension and nausea
  - Caution re sleep attack
    - Pramipexole 0.125-0.75mg po HS
    - Ropinirole 0.25-2mg po HS

Molnar MZ et al. Drugs 2006;66:607-24/Miranda M et al. Neurology 2004;62:831-2
Pellecchia MT et al. Clin Neuropharmacol. 2004;27:178-81/de Oliveira MM et al. Movement Dis 2010;25:1335-42

RLS Refractory Symptoms

- **Gabapentin**
  - 100mg po HS (max 300mg po HS)
- **Benzodiazepine**
  - Clonazepam 0.5mg po HS
  - Questionable efficacy and potential for dependency and risk of falls
- **Clonidine**
  - 0.05mg po HS
  - Watch hypotension

Molnar MZ et al. Drugs 2006;66:607-24
de Oliveira MM et al. Movement Dis 2010;25:1335-42
Thorp ML. AJKD 2001;38:104-8
Micozkadıoglu H. Ren Fail 2004;26:393-7

Assessment

- Rule out mimic disorders
- Rule out drug-induced RLS
- Assess risk/contributing factors
  - Iron deficiency
  - Sleep deprivation
  - Positive family history
  - Rheumatoid arthritis or Sjogren's
  - Pregnancy

Initial Recommendation

- Discontinue or reduce offending drug, if feasible
- Correct Iron deficiency – may prevent initial augmentation with dopaminergic therapy
- Encourage good sleep hygiene (see insomnia flowchart) http://phc.eduhealth.ca/PHC_PDFs/FM/FM.900.St82.PHC.pdf

Medication options

•Avoid opioids and quinine
•For intermittent RLS: Levodopa/carbidopa
•For daily RLS; dopamine agonist
•For RLS with painful neuropathy: gabapentin

Refractory Symptoms

•Clonazepam
•Clonidine

Mimic Conditions

- Movement disorders: akathisia, ADHD
- Restlessness secondary to anxiety, depression, psychotic disorders
- Local leg pathology: e.g. peripheral neuropathy, myelopathy, peripheral venous congestion
- Positional discomfort

Drug-induced RLS

- Dopamine antagonists:
  - Antipsychotics: pimozide, haloperidol, olanzapine, risperidone
  - Metoclopramide, promethazine
- Antidepressants:
  - Mirtazapine (up to 28%)
  - SSRI (<5%) e.g. citalopram, escitalopram, fluoxetine, paroxetine, , sertraline
  - SNRI's (<5%), e.g. duloxetine, venlafaxine

Stimulants: alcohol, caffeine, nicotine
Others: TCA's, carbamazepine, lithium

Pruritus

Prevalence

- Predialysis: 15-49%
- Hemodialysis or peritoneal dialysis: 50-90%
- 84% daily or nearly daily itch
- 46% rated itch as moderate or severe
- 59% reported ongoing itch for > 1 year

Mathur VS et al. CJASN 2010;5:1410-9
Narita I et al. J Nephrol 2008;21:161-5

Consequences

- Decreased Quality of life
- Insomnia
  - 70% complained of insomnia due to itch with score ≥ 7
- Mood disorders
- Increased mortality associated with high itch score

Narita I et al. J Nephrol 2008;21:161-5

Pathogenesis

- Stimulating influences
  - Ca/P deposits in epidermis
  - Secondary hyperparathyroidism
  - Sensitivity to dialysis products
- Dermatological abnormalities
- Immune system derangement
- Imbalance of endogenous opioidergic system
- Neuropathic injury

Narita I et al. J Nephrol 2008;21:161-5
Patel TS et al. AJKD 2007;50:11-20

Non-Drug Measures

- Use gentle soap
- Apply soap only to axillae and groin/perineum (except if visibly dirty)
- Avoid excessive bathing or bathing with hot water – use only lukewarm water
- Eliminate wool or irritating clothing
- Keep finger nails trimmed

Headley CM et al. Nephrol Nurs J 2002;29:525-41

Emollient

- Cream with high water content
- NO lotion
- NO fragrance
- NO or few preservatives
- Apply liberally at least BID and after bathing

Headley CM et al. Nephrol Nurs J 2002;29:525-41

Topical

- **Capsaicin 0.025% cream TID-QID**
  - Mechanism: depletes substance P
  - Side effects: local burning, stinging, erythema
  - Localized area only
- **Topical steroids**
  - Localized area only
  - Lack of studies
- **γ-linoleic acid (GLA) 2.2% cream or GLA rich evening primrose oil** TID-QID
  - Mechanism: ↓ lymphocyte proliferation and lymphokine production

Tang DC et al. Nephron 1996;72:617-22;
Chen YC et al. AJKD 2006;48:69-76

Systemic

- **Antihistamine**
  - Sedating antihistamine, e.g. hydroxyzine
    - Marginal benefit
    - Lack of studies
  - Non-sedating antihistamine – not effective
- **gabapentin**
  - Dose: 100mg PO post dialysis x 4 wks, titrate to effect (max: 300mg post HD for dialysis pts)
  - Side effects: dizziness, somnolence, ataxia

Keithi-Reddy SR et al. KI 2007;72:373-7
Patel TS et al.AJKD 2007;50:11-20
Gunal AI. NDT 2004;19:3137-9

Others…

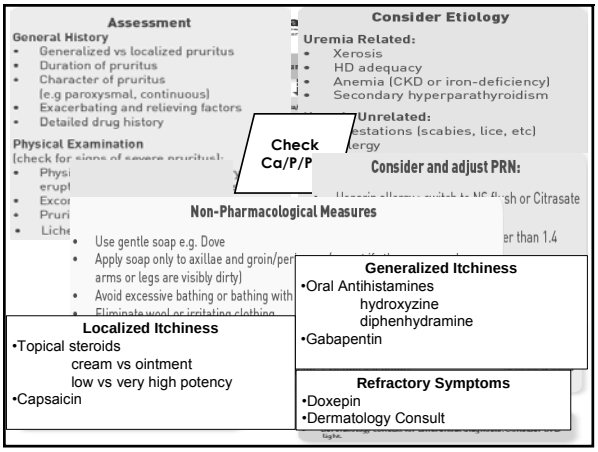
- **Active Charcoal**
  - Mechanism: bind pruritogens in intestinal lumen
  - Dose: up to 6g/day
  - Side effects: adsorption of other meds, tolerability
- **Cholestyramine**
  - Dose: 5g po bid
- Conflicting evidence:
  - Naltrexone, ondansetron, epoetin
- Difficult to access:
  - Thalidomine, nalfurafine

Mettang T et al. NDT 2002;17:1558-63

Evidence…or lack of…

Treatment	Study Type	n	Response
Emollient	Open noncontrolled	21	Remission in 9
Capsaicin 0.025% cr TID x 2wks 0.03% oint QID x 4wks	DB, x-over R,DB,PC,x-over	19 34	Remission in 5; ↓ in 9 ↓84% in pruritus score
γ-linolenic acid 2.2% cr	R,DB,PC, x-over	16	↓40% in pruritus score
Gabapentin 300mg post HD 400mg twice/wk 100mg post HD	R,DB,PC,x-over R,DB,PC,x-over DB,PC,x-over	25 34 25	↓85% in VAS ↓79% in pruritus score ↓94% in pruritus score
Pregabalin 25mg po HS	Open, noncontrolled	12	↓77% in VAS
Activated charcoal 6g/day x 8 wks	PC, x-over	11 23	↓33% in pruritus score Remission in 10, ↓ in 10
Cholestyramine 5g bid	PC, DB	10	↓47% in pruritus score in 4 treated

Morton CA et al NDT 1996;11:2031-6. Chen YC et al AJKD 2006;48:69-76. Tang DC et al Nephron 1996;72:617-22. Gunal AI et al NDT 2004;19:3137-9. Naini AE et al Saudi J Kidney Dis Transpl 2007;18:378-81. Manenti L et al NDT 2005;20:1278-9. Raezghi E et al. Ren Failure 2009;31:85-90. Aperis G et al J Ren Care 2010;36:180-5. Pederson JA et al Ann Intern Med 1980;93:446-8. Giovannetti S et al Nephron 1995;70:193-6. Silverberg DS et al BMJ 1977;1:752-3. Lugon JR. HI 2006;9:180-8



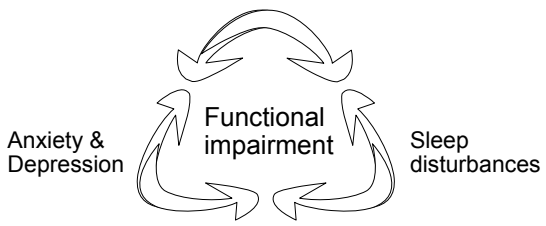
Prevalence in Renal Patients

Literature suggests:

- ~37-50% hemodialysis (HD) pts report pain
- 20-30% pts rated their pain as severe
- 50% of pts who withdrew from HD had significant pain and other distressing symptoms

Davison SN JASN 2003;42:1239-47
Davison SN JASN 2002;13:589A
Cohen LM AJKD 2000;36:140-4

Decreased Quality of Life (QoL)



Multifactorial Causes

Non-Renal Related	Renal Related

• DM neuropathy
• PVD with ischemic limbs
• Musculoskeletal e.g. arthritis
• Others…
	• Renal bone disease
	• Osteomyelitis & discitis
	• HD related
	  • Needling
	  • Muscle cramps
	  • Headaches
	  • Steal syndrome
	  • Amyloid arthropathy
	• PD related
	  • abdominal distension/back pain
	  • peritonitis
	• Calcific uremic arteriolopathy
	• Polycystic Kidney

Davison SN. J Palliative Med 2007;10:1277-87

What are specific issues related to renal patients?

A typical renal patient has…

- Multiple co-morbidities
- Polypharmacy
- Reduced clearance for some drugs
- Increased dialysis clearance for some drugs

Sensitivity to medications!!!

Ferro CJ et al. Management of pain in renal failure
In: Supportive Care for the Renal Patient. EJ Chambers; M Germain; EA Brown (eds)
Davison SN. J Palliative Med 2007;10:1277-87

Barriers to Adequate Pain Relief

- Pts may under-report pain
  - assuming pain is part of underlying condition or dialysis
- Lack of research in pain management in renal pts
- Lack of analgesic pharmcokinetic/ pharmacodynamic data in renal pts
- Lack of training in pain management
- Adverse effects of analgesics may mimic uremic symptoms

Ferro CJ et al. Management of pain in renal failure
In: Supportive Care for the Renal Patient. EJ Chambers; M Germain; EA Brown (eds)
Davison SN. J Palliative Med 2007;10:1277-87

Opioids	Comments
Mild Pain	
codeine	~10% pts lack the enzyme to convert codeine to morphine. May cause more nausea & constipation than other narcotics
Moderate Severe Pain	
morphine	Active metabolites renally cleared and may accumulate in ESRD. Caution with chronic use in renal pts
hydromorphone	Slightly shorter duration than morphine. Less accumulation than morphine in pts with renal failure
oxycodone	Limited data in renal dysfunction – caution
fentanyl	• Causes less nausea or histamine release • Transdermal patch is not recommended for acute pain or narcotic naïve pts; patch may last up to 72 hrs but small # of pts may require q48hr dosing
methadone	Accumulates with repeated dosing, esp on days 2-5. Variable half-life (17-128hrs), longer to titrate. Use with caution in elderly. Blocks NMDA receptor; slow development of tolerance.
Meperidine	Not recommended for post-op or chronic pain management. Neurotoxic and seizure risk. Metabolites accumulate in renal dysfunction.

Ferro CJ et al. Management of pain in renal failure
In: Supportive Care for the Renal Patient. EJ Chambers; M Germain; EA Brown (eds)
Davison SN. J Palliative Med 2007;10:1277-87

Opioids

SPEED LIMIT 5

Adverse Effects	Management
CNS	
Sedation/dizziness	Slow titration; Not to drive
Myoclonus	↓ Dose or Switch to hydromorphone
Confusion/delirium	↓ Dose or Switch to hydromorphone
CVS	
Hypotension/bradycardia	↓ Dose; atropine
Resp	
Respiratory depression	↓ Dose; naloxone
GI	
Nausea/vomiting	Antiemetics
Constipation	Fluid; exercise; bulking agent; stool softener; stimulant
Pruritus	Switch opioids; antihistamines

Lynch ME et al. Pain Res Manage 2006;11:11-38

Antidepressants

- Tricyclic Antidepressants
  - Most literature support for amitriptyline
  - Similar analgesic effects between agents
  - Differs in degree of adverse effects
  - Caution in elderly, heart conduction abnormality
  - Titrate doses slowly
  - Medications for symptom relief
- Serotonin norepinephrine-reuptake inhibitors (SNRIs)
  - venlafaxine (Effexor®), duloxetine (Cymbalta®)
  - Effective in neuropathic pain
  - Better tolerated than TCAs
  - Renal dose adjustment needed
- Selective serotonin-reuptake inhibitors (SSRIs)
  - fluoxetine (Prozac®), paroxetine (Paxil®)
  - Less effective analgesia

Lynch ME et al. Pain Res Manage 2006;11:11-38; Ferro CJ et al. Management of pain in renal failure In: Supportive Care for the Renal Patient. EJ Chambers; M Germain; EA Brown (eds); Davison SN. J Palliative Med 2007;10:1277-87

Tricyclic Antidepressants

Side Effects	Amitriptyline (Elavil®)	Imipramine (Tofranil®)	Nortriptyline (Aventyl®)	Desipramine (Norpramin®)
Sedation	++++	+++	+	+/-
Confusion	++++	+++	+	+
Orthostatic Hypotension	+++	+++	+	++
Arrhythmia	++	++	++	++
Anticholinergic	++++	+++	++	+
Weight Gain	++++	+++	++	++

Most ADRs → Fewest ADRs

Lynch ME et al. Pain Res Manage 2006;11:11-38

Anticonvulsants

- Gabapentin first line
- Adverse effects: Somnolence, dizziness, ataxia

	gabapentin	pregabalin
Absorption	***Saturable***	***Non-saturable across dose range***
Oral bioavailability	***60% 900mg 47% 1200mg 34% 2400mg 33% 3600mg***	***≥ 90%***
Renal Elimination	***70-80%***	***90-99%***
Renal Impairment	***Dosage adjustment***	***Dosage adjustment***
Dialyzability	***Yes***	***Yes***
Onset of action	***≥9 days***	***1-3 days***

Topirimate

- Limited evidence for analgesia
- Adverse effects:
  - CNS: fatigue, nervousness, confusion, mood changes, dizziness, cognitive dysfunction, speech disorders, ataxia, paresthesias
  - kidney stones, altered taste, acute angle glaucoma
- Renal dose adjustment needed

Nabilone

- Synthetic cannabinoid
- Adverse effects:
  - Sedation, euphoria, poor concentration, vertigo, dysphoric mood, hypotension, dry mouth, visual disturbances
- No renal dosage adjustment needed
- Start with 0.5mg PO HS

Recommended Analgesics

YES

- acetaminophen
- Topical NSAIDs
- Opioids
  - hydromorphone
  - oxycodone
  - fentanyl
  - methadone
- tramadol*
- Anticonvulsants*
- Antidepressants
  - TCAs
  - SNRIs*
- Cannabinoids

NO

- NSAIDs
- codeine
- morphine
- meperidine

* Dosing adjustment may be required for some medications

Ferro CJ et al. Management of pain in renal failure In: Supportive Care for the Renal Patient. EJ Chambers; M Germain; EA Brown (eds)

BC Renal Agency

Renal Analgesic Brochure

OPIOID

Hydromorphone (Dilaudid® and Hydromorph Contin®)

Indications	For moderate to severe nociceptive or musculoskeletal pain. Acute or chronic pain. Neuropathic pain – in higher doses.
Mechanisms of Action	Mu receptor agonist.
Pharmacokinetics	Normal half life 2.5 hrs; Oral bioavailability 50%; Extensive hepatic metabolism; <13% excreted unchanged in urine; Glucuronide metabolites are excreted renally.
Adverse Effects	Opioid related adverse drug reactions (see buprenorphine); **May have less adverse effects than morphine in some patients, e.g sedation, confusion, nausea, constipation; Ideal for elderly and pts with renal impairment** due to less active hydromorphone 6-, glucuronide metabolite
Dosing Guidelines (normal)	Start low and titrate to effect, e.g. 0.5 to 1 mg PO q3-4h; sustained release 3 mg PO bid. Available: PO – immediate release(IR), sustained release (SR) e.g. Hydromorph Contin,® oral liquid, suppository. Parenteral – SC/IM/IV
Renal Dosing	>50 (mL/min): 100% · 10 to 50 (mL/min): 75% · <10 (mL/min): 50%
HD/PD Dose	IHD: No · PD: No
Coverage	Hydromorphone IR – yes; Hydromorphone SR – Full benefit for patients in Palliative Program or Special Authority required for patients unresponsive or intolerant of hydromorphone IR or morphine SR.
Cost	Hydromorphone IR 3 mg PO q3h: $27.40 Hydromorphone SR 3 mg PO bid: $45.40

Back to Contents

http://www.bcrenalagency.ca/professionals/End+of+Life+Resources/Pain+Management+Resources.htm

Nociceptive Pain

Pain Score 1-4
Acetaminophen
Topical NSAID or capsaicin

Capsaicin cream 0.025% or 0.075%: Apply bid to qid for localized pain (may take >2 weeks for onset of action).

Pain not controlled or initial pain > 5

ADD OPIOID
Avoid morphine or meperidine

- **Hydromorphone** 0.25-0.5 mg PO or oxycodone 1.25-2.5mg PO Q3-4H prn
- Once stable, consider **CR formulation or fentanyl** patch + breakthrough 1/10th total daily dose PO Q2H prn

Alternatives

- **Tramadol**
- **Buprenorphine**
- **Methadone**

www.bcrenalagency.ca/professionals/End+of+Life+Resources/Pain+Management+Resources.htm

Neuropathic Pain

Pain Score 1-4
Gabapentin 100 mg PO HS
Topical capsaicin

>2 weeks for onset of action).

Pain not controlled for 2-4 wks or initial pain > 5

Intolerable side effects

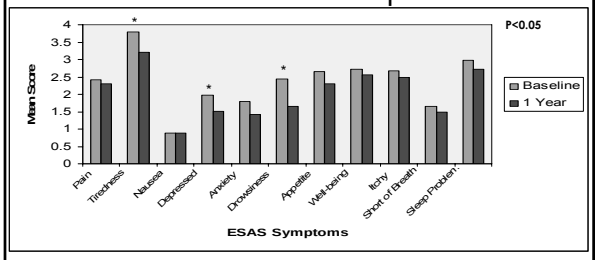
Taper off Gabapentin

- **Add nortriptyline/desipramine 10mg PO daily**
- **Consider opioid – hydromorphone or oxycodone**
- **Alternatives:**
  - **nabilone**
  - **topiramate**
  - **pregabalin**
  - **THC:CBD spray (Sativex®)**

Previous Opioid Algorithm

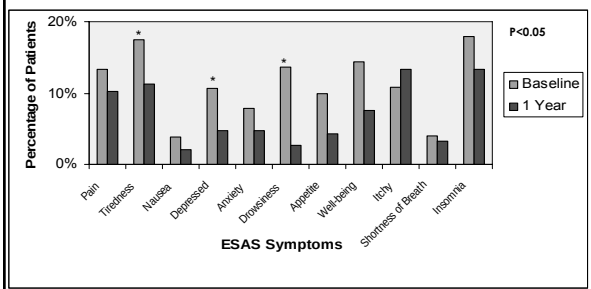
http://www.bcrenalagency.ca/professionals/End+of+Life+Resources/Pain+Management+Resources.htm

ESAS Scores at Baseline and 1 Year at St. Paul's Hosp HD unit



- Mean scores reduced for all symptoms after 1 year of ESAS assessment (n=187)
- Statistically significant decreases with tiredness, depression and drowsiness

Percentage of Pts with SEVERE Symptoms at Baseline vs 1 Year



- % patients with severe scores reduced for all symptoms (except for itch) after 1 year of ESAS assessment (n=187)

BC Provincial Agency Online Resources

http://www.bcpharmagency.ca/professionals/PharmFormSymptomManagementResources.htm