

MEDICATION	CONCENTRATION	24HR DOSE	APPLICATION	REFERENCE
Local anesthetics, Na Ch. Blocker				
Bupivacaine	Up to 40mg/cc (4%)	2 to 25 mg/day recommended <15mg/d	2nd line agent for nociceptive & neuropathic pain	CME Teleconference, 3/2001 Haassenbusch, Neuromodulation 4/99
Ropivacaine	Up to 40mg/cc (4%)	2 to 25 mg/day recommended <15mg/d	4th line agent for nociceptive & neuropathic pain, Category 1	Haassenbusch, Neuromodulation 4/99 CME Teleconference, 3/2001
Tetracaine			4th line agent for nociceptive & neuropathic pain, Category 3	
Opioid Agonists				
Morphine Sulfate	Up to 60mg/cc	0.1 to 20 mg/day	1st line agent for nociceptive & neuropathic pain, FDA approved	CME teleconference, 3/2001 Hassenbusch
Hydromorphone	Up to 200mg/cc usual 10-50mg/cc	0.2-12 mg/day	2nd line agent for nociceptive & neuropathic pain	CME teleconference, 3/2001 Anderson, Pain Medicine 12/2001
Fentanyl	Up to 2500mcg/cc usual 500-5000mcg/cc	63-765 mcg/day 50-600 mcg/day	3rd line agent for nociceptive & neuropathic pain	Hassenbusch Lou, Pain Practice, 3/2001
Sufentanil	up to 100mcg/cc	11-954 mcg/cc 10-900 mcg/cc	3rd line agent for nociceptive & neuropathic pain	Hassenbusch Lou, Pain Practice, 3/2001
Meperidine	Up to 200mg/cc usual 100mg/cc	Up to 300mg/day	4th line agent for nociceptive & neuropathic pain, category 1	Murto, Can. J of Anaesth, 11/99
Methadone	20-60 mg/cc	1.5 to 36 mg/day	4th line agent for nociceptive & neuropathic pain, category 1	Mironer, Neuromodulation, 1/2001
Buprenorphine	??	0.1-?? mg/day	Under research, more used in Germany	Deer, Neuromodulation, 4/99
GABA Agonists				
Baclofen (Kits)	500mcg/20cc 2000mcg/ 20 & 10ccc	25 to 500 mcg/day	1st line agent for spasticity, 4th line agent for pain/spasticity, category 2	CME Teleconference, 3/2001 Dario, Acta Neurologica Scandinavica, 2/2002
Midazolam		0.3-12 mg/day 1.2-6 mg/day	4th line agent for pain/spasticity category 3	Johansenn, Pain Medicine, 6/2002 Krames, Neuromodulation, 4/99
A2 adrenergic agonis				
Clonidine	Up to 8 mg/ml usual 4mg/ml	47-850mcg/day 55-1200mcg/day	2nd line agent for neuropathic pain	CME Teleconference, 3/2001 hassebusch, Pain Medicine, 6/02
NMDA Antagonists				
Ketamine	25mg/cc	31.5-47.2 mg/day Up to 40mg/day 2-3 mg /day	4th line agent for cancer pain, category 3	Sator-Katzensclager, Anesthesia&Analgesia, 10/01 Vranken, Acta Neurologica Scandinavica, 2/04 Haassenbusch, Neuromodulation 4/99
Dextromethorphan	???	???	<u>Animal studies have shown spinal toxicities</u>	
Ca channel antagonists				
SNX-111 (Ziconotide) (Prialt)	10-25mcg/cc	.3-300ng/kg/hr 0.05-0.15 mcg/hr	under study 4th line agent for neuropathic pain and cancer pain	Haassenbusch, Neuromodulation 4/99 Staats, Neuromodulation, 7/01
Verapamil		50-200mcg 1-100mcg	In conjunction with Local anesthetics No studies regarding longterm contionous infusion	Iwasaki, Anesthesia&Analgesia, 3/95 Horvath, Naunyn Schmiedebergs Arch Pharmacol.9/02
Acetylcholinesterase Inhibitor				
Neostigmine	50mcg/cc in dextrose	50-750mcg/day 100->200mcg IT bolus	4th line agent to be used as adjuvant, category 1 causes N/V even in low doses	Klampt, Anaesthesia, 54(1) Haassenbusch, Neuromodulation 4/99
Somatostatin				
Somatostatin	???	10.4-83.3mcg/hr	4th line agent Under investigation, Unstable	Haassenbusch, Neuromodulation 4/99
Octreotide	???	5-20mcg/hr	4th line agent , category 3, stable	Haassenbusch, Neuromodulation 4/99
Adenosine Agonis				
Adenosine	???	0.25-2mg/day up to 1mg single bolus	4th line agent in preclinical studies	Eisenach, Anesthesiology, 1/02 Rane, Anesthesiology, 1998, (89)1108-15

First Line: Clearly established via data and extensive clinical experience
2nd Line: Limited data but extensive clinical experience
3rd Line: Agents show promise but lack sufficient base of scientific data and clinical experience
4th Line: Agent used based on physician judgement in patients with intractable pain due to meager evidence

Category 1: Data supporting safety, but little data on efficacy
Category 2: Anecdotal evidence of pain relief
Category 3: Unresolved safety questions