Equianalgesic Dosing Chart

Equianaigesic Dosing Chart						
Drug	Equianalge	sic Dose (mg)	0	Domestican	Comments	l
Drug	Oral	IV	Oliset	Duration	Comments	
Morphine IR (Oral, IV, SC, IM)		10	20-30 min	3-6 hr		IL
Morphine CR (MS Contin/Oramorph)	30		2-4 hr	8-12 hr		
Morphine SR (Avinza/Kadian/Embeda)			1-2 hr	12-24 hr]-
Codeine	200	120	30-60 min	3-4 hr] .
Hydrocodone IR (Norco)			20-30 min	3-4 hr		Ŀ
Hydrocodone ER (Zohydro ER)	30		6-10 hr	12 hr		1
Hydrocodone ER (Hysingla ER)			8-12 hr	24 hr		1 :
Hydromorphone IR (Dilaudid)	7.5	1.5	20.60:	4-6 hr]] :
Hydromorphone ER (Exalgo)	7.5		30-60 IIIII	24 hr		lĿ
Oxycodone IR (Percocet, Roxicodone)	20		20-30 min	4-6 hr		lГ
Oxycodone MR (Oxycontin)	20		2-4 hr	8-12 hr		lL
Oxymorphone IR (Opana)	10	1	30-60 min	4-6 hr		
Oxymorphone MR (Opana ER)	10		1-3 hr	12 hr		lL
Meperidine	300	100	30 min	3 hr]
Levorphanol	4 (acute)		10 60	401-		11
Levorphanoi	1 (chronic)		10-60 11111			Ш
Methadone	20	10	30-60 min		See Methadone section	-
Fentanyl (IV)		0.1		0.5-3 hr	See Fentanyl patch section	ļг
Remifentanil		0.01	1-5 min			IJŀ
Sufentanil		0.04	1-5 min			<u>↓</u> ⊦
Tramadol IR (Ultram)	150		60 min	4-6 hr	May dec. seizure threshold;	Ш
					max 300mg/day if >75 and	IL
Tramadol ER (Ultram ER)	150		60 min	24 hr	max 200mg/day if renal	Ш
					impaired	L
Buprenorphine IV (Buprenex)		0.3	5-15 min	6-8 hr	May precipitate withdrawal	Ш
Buprenorphine SL (Subutex)	0.4		10-30 min	6-8 hr	of other opioids; don't	Ш
Buprenorphine TD (Butrans; max dose	See Butran	Doeing Chart	17 br	7 days	titrate patch more	П
20 mcg/hr)	See Buttan	Bosing Chart	17 111	/ unys	frequently than 3 days	re threshold; re threshold; r/ if >75 and r/ if renal rif renal rid withdrawal rid ree re
Tapentadol (Nucynta; max dose 500	100mg Tope	10 20-30 min 3-6 hr 1 1 1 1 1 1 1 1 1				
mg/day)			60 min	4-6 hr	agonist/norepinephrine	
ilig/day)	Oxycod	one 15 mg	I	I	reuntake inhibitor	ī

Intraspinal Equianalgedic Chart

E	quianaig	edic Char	Fentanyi Patch	Conversi		
	Oral	Parenteral	Epidural	Intrathecal		

l	Morphine	300 mg	100	mg	10 mg		1 mg	-	Oral Morphine	Fentanyl
1	Hydromorphone	60 mg	20 n	mg 2 mg		0.25 mg		1	Equivalent	Patch
1	Fentanyl		1 m;	g	0.01 mg		0.001 mg		Daily Dose	Dose
ļ	Sufentanil		0.1	mg	0.001 m	ıg			(mg/24-hr)	(mcg/hr)
ł					Ι	60-134	25			
$\frac{1}{2}$	Butrans Patch	Conver	sion		hine to		oversion	Ι	135-224	50
ł	Oral Morphine	Starting	\neg	Oral	auone		itial Ratio		225-314	75
ł	Equivalent	Butrans		Morpl	nine		oral Catio	Γ	315-404	100
ł	Daily Dose	Patch dose	e	Equiv		М	orphine:	Ī	405-494	125
1	(mg/24-hr)			Daily	Dose	O	ral	Ī	495-584	150
]	< 30 or opioid	5 mcg/h	r	(mg/2		М	ethadone)	Ī	585-674	175
l	naïve	patch			: 30		2:1	t	675-764	200
l	30-80	10 mcg/h	ır)-99		4:1	ŀ		
1	30-80	patch		100)-299		8:1	ļ	765-854	225
1		Butrans	s	300	-499		12:1	L	855-944	250
1	> 80	NOT		500	-999		15:1	Ι	945-1034	275
l		appropria	ite	>1	000		20:1		1035-1124	300
I	Children and	Adulte	50 b	a had	v woigh	+ 6	TA DTING	n	OCEC	

Children and A	dults <50 kg body weight §	STARTING DOSES
Drug	Oral Starting Dose	Parenteral Starting Dose
Codeine	0.5-1 mg/kg q 3-4 hr PRN	Not Recommended
Hydrocodone w/	0.2 mg/kg q 3-4 hr PRN	
APAP		
Hydromorphone	0.06 mg/kg q 3-4 hr PRN	0.015 mg/kg q 3-4 hr PRN
Methadone	0.2 mg/kg q 4-8 hr PRN	0.1 mg/kg q 4-8 hr PRN
Morphine	0.3 mg/kg q 3-4 hr PRN	0.05-0.1 mg/kg q 2-4 hr PRN
Oxycodone	0.1 mg/kg q 3-4 hr PRN	
Fentanyl		0.5-3 mcg/kg/dose q 2-4 hr PRN
		0.25-2 mcg/kg/hour continuous infusion

Using Ketamine:

Uses: Refractory pain particularly if neuropathic or refractory to high dose opioids
Oral dosing: 10 mg q 6 hr (must use IV product to compound); increase dose by 10 mg q 6 hr Adverse effects: dizziness, hallucinations, dream-like feelings

Naloxone Administration:
Uses: sedation or respiratory depression from opiods
Dosing: 0.4 mg in 10 mL saline; give 1 mL ever 2-3

Dosing, 0.4 ing in 10 int. sanine, give 1 int. ever 2-5 minutes until response Half-life: 30-60 min so repeat dosing often necessary Infusion: 2.5 mg/250mL started at 4 mL/hr (0.04mg/hr); titrate by 1 mL/hour every 20 minutes

Co-Ana	algesics		
Pain	Pain	Examples	Comments
Source	Character		
Bone or	Tenderness	Ibuprofen 400-800 mg q 4-6 hr	Max dose: 3200 mg/day; available as 100mg/5mL suspension
Soft	over bone or	PRN	
Tissue	joint. Pain on	Celecoxib 100 mg q 12 hr	COX-2 inhibitor; Fewer GI side effects; Avoid in sulfa allergy
	movement.	Ketorolac 10-15 mg q 4-6 hr	Oral, IV, or IM; Maximum of 5 days or 20 doses regardless of route of
	Inflammatory		administration
	pain		
Anxiety	Generalized	Diazepam 2-10 mg q 6-12 hr	Oral, SL, IV, PR; Half-life=20-80 hr; Can give scheduled q12 hr after acute
	restlessness		anxiety resolved
	and	Lorazepam 0.5-4 mg q 4-6 hr	Oral, SL, IV, SQ, PR; Half-life=10-20 hr; Available as an intensol (2mg/mL)
	discomfort	Hydroxyzine 10-50 mg q 4-8 hr	Oral, IM; Liquid available
		Haloperidol 0.5-4 mg q 4-8 hr	Oral, SL, IV, SQ, PR; Can give scheduled q 12 hr after acute anxiety resolved
Nerve	"Burning" or	Desipramine or Nortriptyline 10-	May be sedating; Fewer side effects than amitriptyline; start low and titrate
Pain	"Shooting"	150 mg q HS	every 3-4 days; Analgesic dose typically less than antidepressant dose
	pain radiating	Duloxetine 30-120 mg daily	Use with caution in hepatic impairment
	from plexus	Carbamazepine 100 mg BID	Max: 1200 mg/day; Side effects include blood dyscrasias, SIADH, and rash
	or spinal root	Topiramate 25-50 mg q 12 hr	Max dose 400 mg/day; Titrate dose to effect
		Gabapentin 100-1200 mg TID	Max dose: 6000 mg/d; Start low and titrate up; low doses usually ineffective
		Pregabalin 50 mg q8-12 hr	Max dose: 600 mg/day; Favorable kinetic profile
		Valproic acid 250-1500 mg q HS	Available as immediate release, sustained release, and sprinkle
		or divided doses	
Smooth	Colic-	Hyoscyamine 0.125-0.25 mg q 4-	Oral, SL, IV, SQ; sustained-release available; IV dose: 0.1-0.2 mg q 4 hr
Muscle	Cramping	8 hr	
Spasms	abdominal	Glycopyrrolate 1-2 mg q 4 hr	Oral, IV, SQ; IV dose: 0.1-0.2 mg q 6-8 hr
	pain, bladder	Scopolamine 1.5 mg patch q 72 hr	DO NOT cut patch
	spasms	Dicyclomine 10-20 mg q 8 hr	Oral, IM, 10 mg/mL syrup
		Oxybutynin 5-10 mg q 8 hr	Oral, Liquid, patch; available as sustained release

Management of Onioid Side Effects

Manageme	ent of Opioia Sia	e Effects
Symptom	Recommendation	Comments
Constipation	Docusate 100 mg	- Tolerance does not develop for this side effect
	BID PLUS	- Initiate whenever starting opioid therapy
	Senna 2 tabs	- Titrate until BM of at least q 2-3 days
	daily	- Avoid bulk forming laxatives (miralax) if PO
		fluid intake < 2 L/day
Nausea /	Metoclopramide	- Tolerance often develops for N/V after several
Vomiting	10 mg four times	days of opioid therapy
	daily	- Metoclopramide is drug of choice as 70% of pt.
	Haloperidol 0.5	develop N/V and 50% develop gastric paresis
	mg oral q 4 hr	- Use haloperidol in absence of gastric stasis on
	PRN	as needed basis
		- Prochlorperazine and Promethazine can be
		given rectally
Sedation	Methylphenidate	- Tolerance often develops for sedation after
	or Dextro-	several days of opioid therapy
	amphetamine	- Continued pain when sedated may indicate
	2.5-5 mg qAM	need for stimulant or co-analgesic
	and noon	
Pruritis	Doxepin 10 mg	- Tricyclic antidepressants have an anti-
	daily or twice	histamine effect in addition to anti-depression
	daily	- Pruritis most common with morphine
Respiratory	NOT	- Tolerance to respiratory depression occurs after
Depression	EXPECTED	several days of opioid therapy
	WITH	- Fear of respiratory depression is often
	CHRONIC	overstated and may lead to inadequate analgesia
	OPIOID	- Data show large doses of opioids adequate to

- Ten Principles for Using Opioids Effectively
 1. Perform comprehensive assessment of types and severity of pain
 2. Starting doses based on severity of pain and patient characteristics
- (age, co-morbidities)
 3-step approach: non-opioid for mild pain; low-dose opioid for
- moderate pain; strong opioid for severe pain Manage and anticipate side effects of opioids
- Meperidine, codeine, pentacoine, and nalbuphine are <u>NOT</u> recommended for chronic pain Schedule based on duration of action; If analgesia wears off increase the dose <u>NOT</u> the frequency
- When converting opioids start with 50-75% of equianalgesic dose to account for cross-tolerance
- Break-through/rescue opioid should be 10-15% of total 24-hr opioid dose If patient consistently uses >2 rescue doses per day increase their
- scheduled opioid therapy

 10. In non-verbal patients change in behavior is most reliable way to assess pain

Patient Controlled Analgesia (PCA)

Drug	Loading Dose (Optional)	Bolus dose	Lockout	Four hour Dose Limit
			Interval	
Morphine	Opioid naïve: 2-4 mg	Opioid naïve: 1 mg	8-15	Opioid naïve: 30 mg
	Elderly (>70 yr): 2 mg	Elderly: 0.5 mg	min	Elderly: 10 mg
Hydromorphone	Opioid naïve: 0.2-0.3 mg	Opioid naïve: 0.2 mg	8-15	Opioid naïve: 1.5 mg
	Elderly (>70 yr): 0.2 mg	Elderly: 0.1 mg	min	Elderly: 1 mg
Fentanyl	Opioid naïve: 25-75 mcg	Opioid naïve: 10-50 mcg	8-15	Opioid naïve: 100 mcg
	Elderly: 25 mcg	Elderly: 10-20 mcg	min	Elderly: 60 mcg

Co-Analgesics

Management of Opioid Side Effects

ngesies				<u></u>	
Pain	Examples	Comments	Symptom	Recommendation	Comments
Character			Constipation	Docusate 100 mg	- Tolerance does not develop for this side effect
Tenderness	Ibuprofen 400-800 mg q 4-6 hr	Max dose: 3200 mg/day; available as 100mg/5mL suspension		BID PLUS	- Initiate whenever starting opioid therapy
over bone or	PRN			Senna 2 tabs	- Titrate until BM of at least q 2-3 days
joint. Pain on	Celecoxib 100 mg q 12 hr	COX-2 inhibitor; Fewer GI side effects; Avoid in sulfa allergy		daily	- Avoid bulk forming laxatives (miralax) if PO
movement.	Ketorolac 10-15 mg q 4-6 hr	Oral, IV, or IM; Maximum of 5 days or 20 doses regardless of route of			fluid intake < 2 L/day
Inflammatory		administration	Nausea /	Metoclopramide	- Tolerance often develops for N/V after several
pain			Vomiting	10 mg four times	days of opioid therapy
Generalized	Diazepam 2-10 mg q 6-12 hr	Oral, SL, IV, PR; Half-life=20-80 hr; Can give scheduled q12 hr after acute		daily	- Metoclopramide is drug of choice as 70% of pt.
restlessness		anxiety resolved		Haloperidol 0.5	develop N/V and 50% develop gastric paresis
and	Lorazepam 0.5-4 mg q 4-6 hr	Oral, SL, IV, SQ, PR; Half-life=10-20 hr; Available as an intensol (2mg/mL)		mg oral q 4 hr	- Use haloperidol in absence of gastric stasis on
discomfort	Hydroxyzine 10-50 mg q 4-8 hr	Oral, IM; Liquid available		PRN	as needed basis
	Haloperidol 0.5-4 mg q 4-8 hr	Oral, SL, IV, SQ, PR; Can give scheduled q 12 hr after acute anxiety resolved			- Prochlorperazine and Promethazine can be
"Burning" or	Desipramine or Nortriptyline 10-	May be sedating; Fewer side effects than amitriptyline; start low and titrate			given rectally
"Shooting"	150 mg q HS	every 3-4 days; Analgesic dose typically less than antidepressant dose	Sedation	Methylphenidate	- Tolerance often develops for sedation after
pain radiating	Duloxetine 30-120 mg daily	Use with caution in hepatic impairment		or Dextro-	several days of opioid therapy
from plexus				amphetamine	- Continued pain when sedated may indicate
or spinal root	Topiramate 25-50 mg q 12 hr	Max dose 400 mg/day; Titrate dose to effect		2.5-5 mg qAM	need for stimulant or co-analgesic
	Gabapentin 100-1200 mg TID			and noon	
	Pregabalin 50 mg q8-12 hr	Max dose: 600 mg/day; Favorable kinetic profile	Pruritis	Doxepin 10 mg	- Tricyclic antidepressants have an anti-
	Valproic acid 250-1500 mg q HS	Available as immediate release, sustained release, and sprinkle		daily or twice	histamine effect in addition to anti-depression
	or divided doses			daily	- Pruritis most common with morphine
Colic-	Hyoscyamine 0.125-0.25 mg q 4-	Oral, SL, IV, SQ; sustained-release available; IV dose: 0.1-0.2 mg q 4 hr	Respiratory	NOT	- Tolerance to respiratory depression occurs after
Cramping	8 hr		Depression	EXPECTED	several days of opioid therapy
abdominal	Glycopyrrolate 1-2 mg q 4 hr	Oral, IV, SQ; IV dose: 0.1-0.2 mg q 6-8 hr		WITH	- Fear of respiratory depression is often
pain, bladder	Scopolamine 1.5 mg patch q 72 hr	DO NOT cut patch		CHRONIC	overstated and may lead to inadequate analgesia
spasms	Dicyclomine 10-20 mg q 8 hr	Oral, IM, 10 mg/mL syrup		OPIOID	- Data show large doses of opioids adequate to
	Oxybutynin 5-10 mg q 8 hr	Oral, Liquid, patch; available as sustained release		THERAPY	relieve pain do not hasten death
	Pain Character Tenderness over bone or joint. Pain on movement. Inflammatory pain Generalized restlessness and discomfort "Burning" or "Shooting" pain radiating from plexus or spinal root	Pain Character Pain Examples Character Tenderness Ibuprofen 400-800 mg q 4-6 hr PRN colecoxib 100 mg q 12 hr Ketorolac 10-15 mg q 4-6 hr Metorolac 10-15 mg q 4-6 hr Edecoxib 100 mg q 12 hr Ketorolac 10-15 mg q 4-6 hr Burning' Diazepam 2-10 mg q 6-12 hr "Burning' or "Burning' or "Shooting" pain radiating from plexus or spinal root Topiramate 25-50 mg q 12 hr Gabapentin 100-1200 mg TID Pregabalin 50 mg q8-12 hr Valproic acid 250-1500 mg q HS or divided doses Colic- Cramping abdominal pain, bladder Spasms Dicyclomine 10-20 mg q 8 hr	Pain Character Tenderness Duprofen 400-800 mg q 4-6 hr Wax dose: 3200 mg/day; available as 100mg/5mL suspension Tenderness Over bone or Joint. Pain on movement. Inflammatory pain Generalized Ceneralized restlessness and Hydroxyriae 10-50 mg q 4-6 hr Gral, IV, or IM; Maximum of 5 days or 20 doses regardless of route of administration Burning or "Burning" or "Shooting" and Tenderal State of the Superior of Shooting and Tenderal State of Stat	Pain Character Pain Character Examples Comments	Pain Character Pain Character Tenderness I buprofen 400-800 mg q 4-6 hr over bone or joint. Pain on movement. Inflammatory pain Generalized Diazepam 2-10 mg q 6-12 hr Burning' or "Shooting" spain radiating from plexus or spinal root Colic. Colic.

Ten Principles for Using Opioids Effectively

- Perform comprehensive assessment of types and severity of pain Starting doses based on severity of pain and patient characteristics (age, co-morbidities)
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	Drug	Loading Dose (Optional)	Bolus dose	Lockout	Four hour Dose Limit
				Interval	
е	Morphine	Opioid naïve: 2-4 mg	Opioid naïve: 1 mg	8-15	Opioid naïve: 30 mg
е		Elderly (>70 yr): 2 mg	Elderly: 0.5 mg	min	Elderly: 10 mg
	Hydromorphone	Opioid naïve: 0.2-0.3 mg	Opioid naïve: 0.2 mg	8-15	Opioid naïve: 1.5 mg
		Elderly (>70 yr): 0.2 mg	Elderly: 0.1 mg	min	Elderly: 1 mg
	Fentanyl	Opioid naïve: 25-75 mcg	Opioid naïve: 10-50 mcg	8-15	Opioid naïve: 100 mcg
		Elderly: 25 mcg	Elderly: 10-20 mcg	min	Elderly: 60 mcg

Equianalgesic Dosing Chart

Buprenorphine TD (Butrans; max dose

20 mcg/hr)

Tapentadol (Nucynta; max dose 500

mg/day)

See Butrans Dosing Chart

100mg Tapentadol equal to

oxycodone 15 mg

17 hr

60 min

7 days

4-6 hr

Intraspinal Equianalgedic Chart

Fentanyl Patch Conversion

											-		
Drug	Equianalge	sic Dose (mg)	Onset	Duration	Comments	Drug	Oral	Parenteral	Epidural	Intrathecal			
Drug	Oral	IV	Oliset	Duration	Comments	Morphine	300 mg	100 mg	10 mg	1 mg	Oral Morphine	Fentanyl	
Morphine IR (Oral, IV, SC, IM)		10	20-30 min	3-6 hr		Hydromorphone	60 mg	20 mg	2 mg	0.25 mg	Equivalent	Patch	
Morphine CR (MS Contin/Oramorph)	1		2-4 hr	8-12 hr		Fentanyl		1 mg	0.01 mg	0.001 mg	Daily Dose	Dose	
	30		2-4 111	0-12 III		Sufentanil		0.1 mg	0.001 mg		(mg/24-hr)	(mcg/hr)	
Morphine SR (Avinza/Kadian/Embeda)			1-2 hr	12-24 hr				Morr	ohine to		60-134	25	
Codeine	200	120	30-60 min	3-4 hr		Butrans Patch	1 Conver	sion Math	adone C	onversion	135-224	50	
Hydrocodone IR (Norco)			20-30 min	3-4 hr		Oral Morphine	Starting	Oral		Initial Ratio	225-314	75	
Hydrocodone ER (Zohydro ER)	1		6-10 hr	12 hr		Equivalent	Butrans	Morp		(Oral	315-404	100	
Trydrocodolic ER (Zonydro ER)	30		0-10 III	12 111		Daily Dose	Patch dos	11 .		Morphine:	405-494	125	
Hydrocodone ER (Hysingla ER)			8-12 hr	24 hr		(mg/24-hr)	Tuten dos	Daily		Oral	495-584	150	
Hydromorphone IR (Dilaudid)		1.5		4-6 hr		< 30 or opioid	5 mcg/h	— ∣ ′		Methadone)			
Hudromorphone ED (Evolor)	7.5		30-60 min	24 hr		naïve	patch		< 30	2:1	585-674	175	
Hydromorphone ER (Exalgo)				24 nr			10 mcg/l	hr 30	0-99	4:1	675-764	200	
Oxycodone IR (Percocet, Roxicodone)			20-30 min	4-6 hr		30-80	patch		0-299	8:1	765-854	225	
Oxycodone MR (Oxycontin)	20		2-4 hr	8-12 hr			Butran	s 30	0-499	12:1	855-944	250	
Oxymorphone IR (Opana)						> 80	NOT		0-999	15:1	945-1034	275	
	10	1	30-60 min	4-6 hr			appropria	ate >	1000	20:1	1035-1124	300	
Oxymorphone MR (Opana ER)			1-3 hr	12 hr		Cl-214 4							
Meperidine	300	100	30 min	3 hr		Children and	_						
Levorphanol	4 (acute)		10-60 min	4-8 hr		Drug		Starting Dos			Parenteral Starting Dose		
*	1 (chronic)					Codeine	_	mg/kg q 3-4		Not Recomm	Not Recommended		
Methadone	20	10	30-60 min	12-190 hr	See Methadone section	Hydrocodone w	/ 0.2 m	0.2 mg/kg q 3-4 hr PRN					
Fentanyl (IV)		0.1	1-5 min	0.5-3 hr	See Fentanyl patch section	APAP							
Remifentanil		0.01	1-5 min			Hydromorphone	e 0.06 i	ng/kg q 3-4	hr PRN	0.015 mg/kg	g q 3-4 hr PRN		
Sufentanil		0.04	1-5 min			Methadone	0.2 m	g/kg q 4-8 l	nr PRN	0.1 mg/kg q	4-8 hr PRN		
Tramadol IR (Ultram)	150		60 min	4-6 hr	May dec. seizure threshold;	Morphine	0.3 m	g/kg q 3-4 l	ır PRN	0.05-0.1 mg	/kg q 2-4 hr PRN		
				l	max 300mg/day if >75 and	Oxycodone	0.1 m	g/kg q 3-4 l	ır PRN				
Tramadol ER (Ultram ER)	150		60 min	24 hr	max 200mg/day if renal	Fentanyl		1		0.5-3 mcg/k	g/dose q 2-4 hr PR	N	
					impaired						kg/hour continuou		
Buprenorphine IV (Buprenex)	0.4	0.3	5-15 min	6-8 hr	May precipitate withdrawal				·		0		
Buprenorphine SL (Subutex)	0.4		10-30 min	6-8 hr	of other opioids; don't	Usina Vatamina				. 1			

titrate patch more

mu-opioid

frequently than 3 days

agonist/norepinephrine

uptake inhibito

Using Ketamine:

Using Ketamine:
Uses: Refractory pain particularly if neuropathic or refractory to high dose opioids
Oral dosing: 10 mg q 6 hr (must use IV product to compound); increase dose by 10 mg q 6 hr
Adverse effects: dizziness, hallucinations, dream-like feelings

Naloxone Administration:

Uses: sedation or respiratory depression from opiods
Dosing: 0.4 mg in 10 mL saline; give 1 mL ever 2-3 minutes until response
Half-life: 30-60 min so repeat dosing often necessary
Infusion: 2.5 mg/250mL started at 4 mL/hr
(0.04mg/hr); titrate by 1 mL/hour every 20 minutes