

Rancho Los Amigos National Rehabilitation Center **DEPARTMENT OF NURSING CLINICAL** POLICY AND PROCEDURE

SUBJECT: INTRAVENOUS THERAPY:

Policy No.: C122 Effective Date: 10/1996 IV SOLUTION AND MEDICATION **ADMINISTRATION** Page: 1 of 17

Purpose of Procedure: To provide the policies for administration of intravenous (IV) therapy including those specific to solutions, medications, and IV push medications.

Physician's Order Required: Yes

Performed by: RNs (may perform all functions), LVNs with IV Certification (only those functions specified below), and Affiliating Student Nurses in an RN program under the direct supervision of an RN (only those functions specified below).

Standards of Practice:

- A. The nurse is responsible for knowing the following information regarding any IV solution and medications administered:
 - 1. Indications for use and basic mechanism of action
 - 2. Usual dosage, acceptable volume, and rate of administration
 - 3. Possible adverse reactions and side effects
 - 4. Procedure for managing "untoward" IV therapy reactions
 - 5. Potential drug interactions
 - 6. Additional nursing measures to implement before, during, or after IV administration (e.g. monitor B/P, HR, temp.)
- В. IV therapy will be performed by nurses who have acquired knowledge and skills in IV therapy and have completed general orientation.
- If the nurse has any questions about an IV fluid or medication order, they must clarify it with the C. prescribing Physician, Licensed Independent Practitioner (LIP) or pharmacy staff.
- D. IV infusion pump should be used for all IV solutions and medications with the exception of some IV boluses. Refer to the Bolus Infusion section below.
- E. Keep Vein Open IVs (RNs, Affiliating RN Students, and IV Certified LVNs):
 - 1. A non-medicated IV solution will be hung for "keep vein open" (KVO)
 - 2. KVO IVs will infuse at a rate of
 - a. Pediatric patients: 5mLs/hour
 - b. Adult patients: 10mLs/hour

Key Point: It is strongly recommended that an IV be converted to a saline lock rather than maintaining a KVO line

- F. Physician Orders:
 - 1. Physician/LIP orders for IV infusions must include:
 - a. Patient's Name and MRUN
 - b. Date and time
 - c. Type/name of solution or medication
 - d. Flow rate or volume to be administered
 - e. Name and dosage of IV additive, as applicable
 - f. Route of administration

APPROVED BY:

- g. Time and frequency of administration
- 2. All continuous IV infusion bags, with or without additives, must be changed every 24 hours.
- G. Pediatric IV Therapy (RNs, Affiliating RN Students, and IV Certified LVNs):
 - 1. The IV order should specify the total volume to be administered every 24 hours or should be ordered by mLs/kg/24 hours
 - A volume-control infusion set (e.g., volutrol) must be used in conjunction with the infusion pump, which shall contain a limited volume of IV solution based on the weight of the patient Key Point: 15 kg or less – No more than 2 hours of solution in tubing set;

16 – 30 kg – Maximum of 150 mLs of solution in tubing set



- H. IV Certified LVNs may hang and monitor the following IV infusions:
 - 1. Isotonic fluids: NS, D5W
 - 2. Hypertonic fluids: D51/2NS, D51/4NS
 - 3. No medications or additives, except vitamins

Intermittent IV Medication (IVPB) (RNs and Affiliating RN Students)

- A. The IVPB order written by a physician/LIP must include all information pertinent for all other medication orders.
- B. All IVPB medications will be added to appropriate diluent and in the appropriate amount by pharmacy.

Exceptions: Medications determined by pharmacy to be unstable for premixing will be mixed by RN just prior to administration in the amount and type of diluent determined by Pharmacy.

- C. All IVPB medications will be administered at a rate of 50mL/30 minutes or as recommended by pharmacy on the IV label.
- D. IVPB medication may be administered in the same line as continuous infusion using a secondary line if compatible.
- E. For continuous IV infusions which are incompatible with a prescribed IVPB medication, one of the following is to be done:
 - 1. Have separate lines for the continuous infusion and the IVPB
 - 2. Use the SAS method to flush the line (outlined in of Policy C122.16 *IV Therapy: Guidelines for Care and Maintenance of Intravascular Catheters and Sites attachment A*) before and after the IVPB to prevent drug precipitates

Key Point: This method should only be done if a 2nd IV line cannot be obtained

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F. The pharmacist will adjust the administration times, to standard times, accordingly by using the RLANRC IVPB Timing Wheel (Attachment B).

Intravenous Infusions (RNs and Affiliating RN Students)

- A. If medication is ordered to be infused, administer per drug library guidelines in the IV smart pump.
- B. If the IV medication ordered is not in the location's care area of the IV smart pump, consult with the pharmacist to determine if the medication can be administered in the current location or if patient needs to be transferred to a monitored unit.

Intravenous Push (IVP) Medications (RNs only)

- A. Medications listed in the *IV Push/Infusion Medications Guidelines* (Attachment A) can only be administered in the Intensive Care Unit (ICU), Progressive Care Unit (PCU), and Post Anesthesia Care Unit (PACU).
- B. The IV line will be flushed before and after each IVP medication using the SAS method as appropriate (See Policy C122.16 *IV Therapy: Guidelines for Care and Maintenance of Intravascular Catheters and Sites, attachment A*).

Key Point: IV Certified LVNs and Affiliate RN Students may administer saline flushes to maintain patency of saline lock. They are not allowed to administer any IVP medications.

Titratable Medications (ICU- some exceptions may apply)

- A. Examples of titratable medications include
 - 1. Vasopressor therapy
 - 2. Sedation
 - 3. Pain medication
- B. Order must include the following
 - 1. Medication name
 - Initial infusion rate
 - 3. Titration parameters
 - 4. Physician notification instructions if applicable
- C. Assessment
 - 1. Patient will be assessed at frequent intervals as ordered to determine need for medication dose adjustment.
 - 2. Medication concentration will be verified with IV bag changes and within one hour of assuming care of patient

Untoward IV Therapy Reactions (RNs, Affiliate RN Students, IV Certified LVNs)

- A. Immediately stop the infusion of IV solution when an untoward IV therapy reaction is known or suspected.
- B. Assess the type of reaction (e.g. urticaria, erythema), monitor the vital signs, and other necessary parameters. Notify the physician/LIP.
- C. Do not discontinue the IV catheter
- D. Maintain the venous access with a saline lock or non-medicated IV solution

- E. If peripheral IV site is infiltrated, remove the IV catheter and restart a saline lock and connect to non-medicated IV solution as ordered.
- F. Document:
 - Document all assessments and interventions related to the untoward reaction in the electronic health record.
- G. Report:
 - 1. Complete an event notification
 - 2. If adverse drug reaction is suspected, the established reporting procedure will be followed. Refer to Pharmacy Policy 1.15.0 Adverse Drug Reaction Reporting.

Intravenous Medication Mix (In ICU, OR, and PAR only)

A. A pharmacist or pharmacy staff, under the supervision of a pharmacist, compounds or admixes all compounded sterile preparations, except in urgent situations in which a delay could harm the patient.

Bolus Infusions

- 1. IV bolus may be hung:
 - a. Wide-open
 - b. Using pressure bag
 - d. Via smart pump (The infusion rate will be (1) liter per hour, unless otherwise specified)

Documentation

- A. The RN/LVN is responsible for providing appropriate instruction to the patient/family. Document any patient education provided, including:
 - 1. What to expect before, during, and after the IV administration
 - 2. Report any side effects to the nurse immediately
 - 3. Any activity restrictions during IV administration
- B. Documentation should include the following:
 - 1. Line type
 - 2. Line status
 - 3. Line care provided
 - 4. Site condition
 - 5. Dressing condition
 - 6. Patency
 - 7. Rate of flow and type of solution
 - 8. Routine and non-routine site changes
 - 9. Conversion into a saline lock

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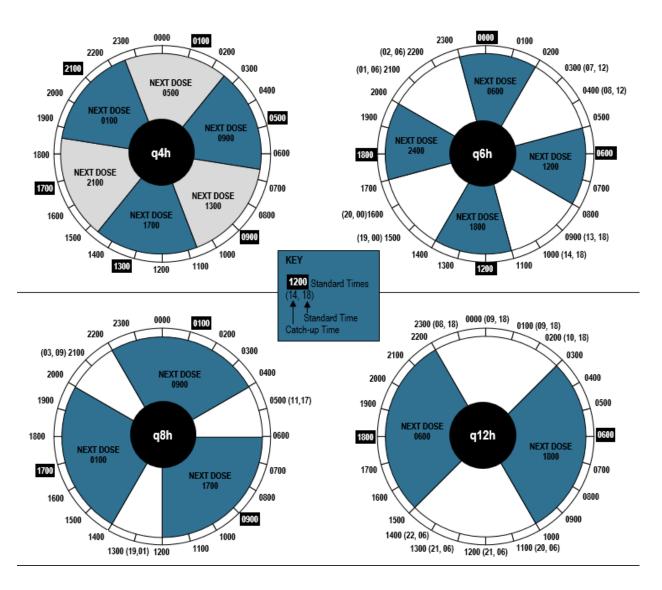
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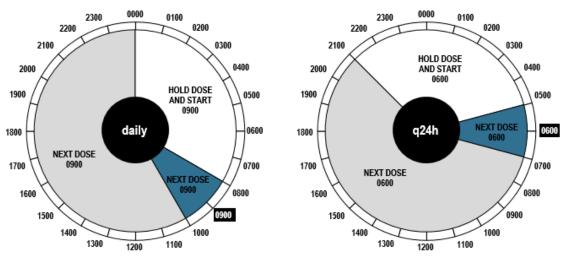
10/96 - New	07/08 - Revised	04/18 - Revised
10/99 - Revised	03/12 -Revised	03/22 - Revised
09/02 - Revised	04/13 - Revised	04/23 - Revised
03/06 - Revised	05/16 - Revised	
04/07 - Revised	11/17 - Revised	

Attachment A – *RLANRC IVPB Timing Wheel*

Attachment B – *IV Medication Administration Guidelines*

IVPB TIMING WHEEL





Medication/Classification		ICU			PCU			PACU,			led-Su Rehab		Ar	nbulate Care	ory	Comments/Recommendations
	IVP	IVPB	Drip	IVP	IVPB	Drip	IVP	IVPB	Drip	IVP	IVPB	Drip	IVP	IVPB	Drip	
Abatacept (Orencia)		X			X			X			X			х*		Infuse over 30 minutes * Infusion Clinic only
Acetazolamide (Diamox)	X	X		х	X		х	X								IVP over 3 minutes Recommended Max dose 1 gram in 24 hours. Check if in the pyxis includes instructions for reconstitution
Acetylcysteine (Acetadote)		x	X		X	X		X	X							Dose 1 Max 15 Grams - over 1 hour Dose 2 max 5 Grams - over 4 hours Dose 3 Max 10 Grams - over 16 hours may continue as appropriate
Acyclovir		X			X			X			X			X		
Adenosine (Adenocard)	х			х			х									May be administered in any area during emergency situations
Albumin 5% Albumin 25%		X			X			X			X			X		Generally administered over 30-60 minutes
Altaplase (Cathflo)	X			X			X			X			X			Refer to Policy C122.17
Alteplase (Activase, TPA)	х	X														May administer in any area during emergencies by trained staff Max recommended doses: PE - 100 mg Stroke - 90mg
Aminocaproic Acid (Amicar)		X	х		X	X		X	X							Loading dose generally administered over 30-60 minutes
Amikacin		X			X			X			X			X		

Note: For pediatric patients consult with pharmacy. All Antibiotics can be administered in all units If the ordered medications is not listed, consult with pharmacy to determine if a transfer is needed

		ICU			PCU			PACU			led-Su		Ar	nbulate	ory	
Medication/Classification								oscopy			Rehab			Care		Comments/Recommendations
Ampicillin	IVP	IVPB X	Drip	IVP	IVPB X	Drip	IVP	IVPB X	Drip	IVP	IVPB X	Drip	IVP	IVPB X	Drip	
Aminophylline (Theophlline)		X			X			X			A			A		
Amiodarone	X For Cardia c arrest	X	X	X For Cardia c arrest	X	X	X For Cardia c arrest	X	X							May be administered in any area during emergencies. Loading dose over 10 minutes. Maintenance: 1mg/min over 6 hours, then 0.5mg/min over 18 hours or longer as needed
Argatroban			X			X			X			х				Used to bridge Coumadin. May artificially increase the INR, do NOT stop infusion without consulting with MD or pharmacy.
Azithromycin		X			X			X			X			X		
Aztreonam	X	X		X	X			X	X	X	X		X	X		IVP over 3 minutes
Bactrim		X			Х			X			Х			X		
Bumetanide (Bumex)	х	X	X	х	X	X	х	X	X	х	X		х	X		Generally IVPB administered over 15 minutes
Bivalirudin (Angiomax)							х*									May be given in any area during emergencies *Fluoroscopy Suite only
Calcium Chloride & Gluconate	х	X			X			X			X					Refer to Policy C122.10
Cefazolin	X	X		X	X		X	X		X	X		X	X		IVP over 3 minutes
Cefepime	х	X		Х	X		Х	X		X	X		X	X		IVP over 5 minutes

Note: For pediatric patients consult with pharmacy

Medication/Classification		ICU			PCU			PACU/		N	Ied-Su		Ar	nbulate	ory	Comments/Recommendations
Medication/Classification	IVP	IVPB	Drip	IVP	IVPB	Drip	Fluor IVP	oscopy IVPB	Suite Drip	IVP	Rehab IVPB	Drip	IVP	Care IVPB	Drip	Comments/Recommendations
Cefoxitin	х	X		X	X		X	X		X	X		X	X		IVP over 3 minutes
Cefotetan	Х	X		X	X		X	X		X	X		Х	X		IVP over 3 minutes
Ceftazidime	X	X		X	X		Х	X		X	X		Х	X		IVP over 3 minutes
Ceftriaxone	Х	X		Х	X		Х	X		X	X		X	X		IVP over 5 minutes
Chlorpromazine (Thorazine)	х	X			X			X								Monitor for hypotension at least 30 minutes after administration
Ciprofloxacin		X			X			X			X			X		
Cisatracurium (Nimbex)	Х		X													
Clindamycin		X			X			X			X			X		
Colistimethate	Х	X		X	X		X	X		X	X		Х	X		IVP over 3 minutes
Crotalidae Polyvalent	Х	X	X	X	X	X										
Dantrolene (Dantrium)	X						X									May be administered in any area during emergencies
Daptomycin	X	X		X	X		X	X		X	X		X	X		IVP over 3 minutes
Deferoxamine		X	X		X	X		X			X			X		
Desmopressin (DDAVP)	X	X		X	X		X	X								
Dexamethasone (Decadron)	X	X		X	X		X	X		X	X		X	X		
Dexmedetomidine (Precedex)	х		Х						X*							*Fluoroscopy Suite only
Digoxin (Lanoxin)	х	X		X	X		х	X		X	X					Max IVP dose= 0.5mg IVPB over 20 min for doses over 0.5mg

Note: For pediatric patients consult with pharmacy

3.5. 31 (1. (6) 10) (1.		ICU			PCU			PACU			Ied-Su		Ar	nbulat	ory	
Medication/Classification	IVP	IVPB	Drip	IVP	IVPB	Drip	Fluor	oscopy IVPB	Suite Drip	IVP	Rehab IVPB	Drip	IVP	Care	Drip	Comments/Recommendations
Digoxin Immune FAB(Digibind)	X	X	Drip	IVF	IVFB	Drip	IVF	IVFB	Drip	IVF	IVFB	Drip	IVF	IVFB	Drip	
Dilitiazem (Cardizem)	х		X	х		X	х		X							IVP over 2 min. Rate change per provider order only
Diphenhydramine (Benadryl)	Х	X		X	X		X	X		Х	X		X	X		IVP 25 mgs/minute
Dobutamine HCL (Dobutrex)			X						X							Rate change per provider order only.
Dopamine HCL (Intropin)			X						X							May administer in any area during emergencies
Doxapram HCL (Dopram)	X		X				X		X							
Eculizumab (Soliris)		X			X			X			X			х*		Infuse over 35 minutes *Infusion Clinic only
Endrophonium Chloride (Tensilon)	х															Must be administered by provider Ensure Atropine is readily available
Enalaprilat Maleate (Vasotec)	х			х			Х									Slow IV push over 5 minutes.
Enoxaparin (Lovenox)	X															May be administered in any area during STEMI emergency
Epinephrine HCL			X						X							May administer in any area during emergencies
Eptifibatide (Integrelin)	X		X	X		X	X		X							
Ertapenem		X			X			X			X			X		
Esmolol (Brevibloc)	х		X				х		x							Generally max <u>loading</u> dose may be 500mcg/kg over 1 minute Max infusion rate: 300mcg/kg/minute

Note: For pediatric patients consult with pharmacy

		ICU			PCU			PACU/		N	Ied-Su		Ar	nbulat	ory	
Medication/Classification	IVP	IVPB	Drip	IVP	IVPB	Drip	Fluor	roscopy IVPB	Suite Drip	IVP	Rehab	Drip	IVP	Care IVPB	Drip	Comments/Recommendations
Famotidine (Pepcid)	х	X	БПр	X	X	БПр	X	X	Diip	X	X	Бир	X	X	Бир	administer IVP over at least 2 minutes
Fat Emulsion (10%)		X			X			X			Х					Usually over 10 hours.
Fat Emulsion (20%)		X			X			X			Х					Usually over 10 hours.
Fentanyl	х		X				Х		X							Administer IVP over 1-2 minutes
Filgrastim (Neupogen) Hematopoietic		X						X								Incompatible with Normal Saline
Flucanazole		X			X			X			х			х		
Flumazenil	X	X		Х	X		X	X		X	X		X	X		IVP ov 15-30 seconds
Folic Acid		X			X			X			X			X		
Fosphenytoin (Cerebyx)Anticonvulsant		X			X			X			X			X		IVPB max rate 150 mg Phenytoin Equivalents/minute
Furosemide (Lasix) Diuretic	X	X	X	х	X	X	Х	X	X	X	X		X	X		_
Gentamycin		X			X			X			X			X		
Glucagon	X		X	X			X									IVP rate 1mg/min IVP dose may cause severe N/V
Haloperidos (Haldol)	X			х												Off label IV usage IVP 10mg/min
Heparin	X		X	X		X	X		X	X		X	X			
Hydralzine (Apresoline)	X			X			X									
Hydrocortisone - Succinate (Solu-cortef)	х	X		x	X		X	X		X	x		X	X		IVP administer over 30 seconds to 10 minutes based on dose

Note: For pediatric patients consult with pharmacy

		ICU			PCU			PACU/			Ied-Su		Ar	nbulate	ory	
Medication/Classification	IVP	IVPB	Drip	IVP	IVPB	Drip	Fluor IVP	oscopy IVPB	Suite Drip	IVP	Rehab IVPB	Drip	IVP	Care	Drip	Comments/Recommendations
Hydromorphone (Dilaudid)	X	1412	X	X	1412	X	X	141.0	X	X	141.0	х*	141	1412	Ш	IV Drip administered via PCA on all units or for patient in Comfort Care *Med-Surg only
Ibutilide (Covert) Antiarrhythmic		X						X								Infuse over 10 minutes
Immune Globulin (IVIG)		x			X			X			X			х*		Monitor for hypersensitivity reactions *Infusion clinic only
Infliximab (Inflectra)		X			X			X			X			х*		Infuse over 2-3 hours * Infusion clinic only
Insulin Regular	X		X	х*			х*		X	х*			х*			*IVP for hyperkalemia only
Iron Dextran (Infed)		X			X			X			X			X		Monitor for hypersensitivity reactions
Iron Sucrose (Venofer)		X			X			X			X			X		
Isoproterenol (Isuprel)			X						X							
Ketamine	X		X						X							
Labetolol (Normodyne)	X		X	X			х									Provider presence for initial bolus Do not titrate, dose changes ordered by provider Telemetry required
Lacosamide (Vimpat)		X			X											
Levetiracetam (Keppra)		X			X			X			X			X		May cause hypertension. Adjust for renal impairment
Levofloxacin		X			X			X			X			X		
Lidocaine (Xylocaine)	X		X	X			X									May be administered in any area during emergencies
Linezolid		X			X			X			X			X		
Lorazepam (Ativan)	X		X	X			X			X			X			

Note: For pediatric patients consult with pharmacy

M. P. d'm/Claud'Cad'an		ICU			PCU			PACU		N	Ied-Su		Ar	nbulato	ory	
Medication/Classification	IVP	IVPB	Drip	IVP	IVPB	Drip	Fluor	roscopy IVPB	Suite Drip	IVP	Rehab IVPB	Drip	IVP	Care IVPB	Drip	Comments/Recommendations
Magnesium Sulfate		X	X		X			X			X					Refer to Policy C122.10
Mannitol (Osmitrol)		X	X		х*			X	X		x*					Use filter provided by pharmacy * Okay to be given during Dialysis
Meropenem	X	X		X	X		X	X		X	X		X	X		IVP over 3 minutes
Methyldopa (Aldomet)		X			X			X								
Methylprednisolone Sodium Succinate (Solu- Medrol)	X	X	X	Х	X	X	х	X		Х	X		х	X		IVP over 3-15 mins; IVPB is recommended for doses over 250mg
Metoclopramide (Reglan)	X	X		X	X		X	X		X	X		X	X		IVP over 1-2 minutes; IVP max dose = 10mg
Metoprolol (Lopressor)	X			X			X									
Metronidazole		X			X			X			X			X		
Midazolam (Versed)	X		X	х*			X									*In the presence of ICU/OR team
Milrinone	X		X			X* with Care Team approv al only										Central or PICC line required with a dedicated port for milrinone * Care Team: Nurse Manager or Designee, Intensivist, & accepting MD
Morphine sulfate	X		X	X		X	X		X	X		X				•
NaCl 3%		X	X													Central line Preferred
NACl 23.4%	X															Central Line Preferred Pharmacy MUST SEND EXACT DOSE
Naloxone (Narcan)	Х		X	X			X			X						
Natalizumab (Tysabri)		X			X			X			X			x*		* Infusion Clinic only
Nicardipine (Cardene)			X													

Note: For pediatric patients consult with pharmacy

Nitroglycerin			X													MAX dose = 200mcg/min
Medication/Classification	IVP	ICU IVPB	Drip	IVP	PCU IVPB	Drip		PACU/ coscopy			led-Su Rehab		An	nbulate Care	Ory Drip	Comments/Recommendations
Nitroprusside (Nipride)	141	1410	X	141	IVID	Dilp	141	1410	Diip	141	1411	Diip	141	1411	Dip	
Norepinephrine (Levophed)			X													Central line preferred
Octreotide (Sandostatin)	X		X	X		X	X		X	X		X	X		X	Monitor glucose levels
Ondansetron (Zofran)	X	X		X	X		X	X		X	X		X	X		IVP over 2-5 minutes
Oxacillin		X			X			X			X			X		
Pancuronium bromide (Pavulon)	х		X													
Pantoprozole (Protonix)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Pamidronate Disodium		X	X		X	X										
Penicillin		X			X			X			X			X		
PENTObarbital (Nembutal)	х		X													
PHENObartial (Luminal)	х	X	X													Max recommended rate = 60mg/min
Phentolamine (Regitine)	X	X					X	X								
Phenylephrine (Neo-synephrine)			X													Central line preferred
Phenytoin (Dilantin)		X			X			X			X			X		
Phytonadione (Vitamin K)		X			X			X								
Potassium Acetate		X			X			X			X			X		Refer to Policy C122.10
Potassium Chloride (K- rider)		х			х			X			X			X		Refer to Policy C122.10
Potassium Phosphate		X			X			Х			X			X		Refer to Policy C122.10
Pralidoxime (Protopam)	х	X														IVP administer over 5 minutes
Procainamide (Pronestyl)	X	X	X													MAX rate = 1g over 1hr

Note: For pediatric patients consult with pharmacy

																May administer in all areas during emergencies
Medication/Classification	IVP	ICU IVPB	Drip	IVP	PCU	Drip		PACU/ oscopy ivpb			led-Su Rehab IVPB		An	nbulate Care	Drip	Comments/Recommendations
Prochlorperazine (Compazine)	X	X	Disp	X	X	Бир	X	X	Disp	X	X	Dip	X	X	Dip	Monitor for hypotension for at least 30 minutes after administration
Propofol (Diprivan)	х		х													Patient must be intubated & mechanically ventilated; NOT for patients younger than 16 years of age (except for ICP control)
Protamine sulfate	X	X		X	X		X	X		X	X		X	X		Max rate: 100mg/min
Pyridostigmine	X															
Ranitidine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Remifentanil			X													
Rituximab (Ruxience)		X			X			X			X			х*		* Infusion Clinic only
Rocuronium (Zemuron)	х															IVP initial bolus requires provider presence - Patient must be intubated
Sodium Acetate		X			X			X			X			X		
Sodium Bicarbonate	х	X	X	х	X	X										May be given in any area during emergencies
Sodium Ferric Gluconate (Ferrlecit)		X			X			X			X			X		
Sodium Phosphate		X			X			X			X			X		
Streptokinase	X		X													
Succinylcholine chloride (Anectine)	х															Provider presence required
Sufentanil		X	X													
Tenecteplase (TNKase)	х															May be given during Code Stroke

Note: For pediatric patients consult with pharmacy

Thiamine		X			X			X			X			X		
Tigacyl		X			X			X			X			X		
Medication/Classification		ICU			PCU		Fluor	PACU/ oscopy	Suite		Ied-Su Rehab)		nbulat Care		Comments/Recommendations
Tobramycin	IVP	IVPB X	Drip	IVP	IVPB X	Drip	IVP	IVPB X	Drip	IVP	IVPB X	Drip	IVP	IVPB X	Drip	
Tocilizumab		X			X			X			X			x*		* Infusion Clinic only
Tranexamic acid		Х	X													
Unasyn		X			X			X			Х			X		
Valproate Sodium		X			X			X			X			X		
Vancomycin		X			X			X			X			X		
Vasopressin (Pitressin)	X		X													May be given in any area during emergencies
Vecuronium (Norcuron)	Х		X													IVP initial bolus requires provider presence - Patient must be intubated
Verapamil (Calan)	X		X													Provider presence required
Vitamin K (Synkovite)		X			X			X			X			X		
Zidovudine		X			X			X			X			X		
Zoledronic Acid (Zometa)		X			X			X			X			х*		*Infusion Clinic only
Zosyn		X			X			X			X			X		