# Intravenous fluid conservation strategies

Evaluation and implementation of conservation strategies for intravenous (IV) fluids and peritoneal dialysate solutions are a critical response of hospitals and health systems following supply constraints associated with the impacted Baxter North Cove facility. Food and Drug Administration (FDA) has released information for Hurricane Helene: Baxter's manufacturing recovery in North Carolina.

Vizient has available the 2023 Adult and pediatric IV push medication reference, detailing general conservation strategies for IV fluids and specific IV push administration information for select medications. Additionally, the American Society of Health-System Pharmacists (ASHP), has provided an update to their 2014 and 2022 fluid conservation strategy document entitled, Small- and Large-Volume Fluid Shortages – Suggestions for Management and Conservation.

This document contains supplementary information for:

- IV fluid conservation checklists
- Oral rehydration protocols
- Resuscitation strategies
- Total parenteral nutrition (TPN) considerations
- Appendix 1: Oral fluid guidelines
- Appendix 2: Peritoneal dialysate solutions
- Appendix 3: Available pre-mix products
- Appendix 4: Surgical irrigations

## IV fluid conservation checklist for hospitals and health systems

| Checklist for IV fluid conservation[a] | |
|---|---|
| **Planning** | |
| ☐ | Create a multidisciplinary planning team to address IV fluid supply and schedule regular meetings |
| ☐ | Include representatives from medicine, nursing, pharmacy, nutrition, supply chain, medication safety, infectious diseases prevention, risk management, ethics, representation from the pharmacy & therapeutics committee, regulatory, and other representation the planning team deems necessary |
| ☐ | Identify topics requiring multidisciplinary approval – extending hang times, adjustments to order sets, approval of IV to by mouth (PO) protocols, plans to notify and educate staff of practice changes, etc |
| ☐ | Centralize inventory – remove stock from areas with low utilization; coordinate inventory counts, review of allocations, and ordering and storage between supply chain and pharmacy |
| ☐ | Consider delaying or postponing elective procedures if clinically appropriate to conserve IV fluid inventories |
| **Ordering / prescribing** | |

| | |
|---|---|
| ☐ | Review all order sets with pre-checked IV fluids, to determine which are not required and can be adjusted – make manual process / decision point if provider wants patient to receive IV fluids |
| ☐ | Coordinate with information technology (IT) to include alerts and advise alternatives in the electronic medical record (EMR) where appropriate |
| ☐ | Actively review patients receiving IV fluids or IV medications to assess discontinuation or the ability to switch to an alternative route of administration, as clinically appropriate |
| ☐ | Clinical nutrition services to actively review patients with nothing by mouth (NPO) orders periodically to assess for ability to receive oral fluids – limit use of total parenteral nutrition (TPN) and consider nasogastric (NG) or orogastric (OG) tube when possible if functioning gut |
| ☐ | Consider discontinuing the practice of standing fluid orders to keep infusion lines open and use intermittent line flushing to maintain patency or deliver lowest infusion rate possible |
| ☐ | Review, revise, and reinforce IV to PO conversion protocols |
| ☐ | Utilize oral rehydration in place of IV fluids when able and clinically appropriate |
| **Administration** | |
| ☐ | In instances where oral medication administration is not feasible, consider intramuscular, subcutaneous or IV push administration, to conserve fluids, as appropriate based on the medication |
| ☐ | Maximize concentrations of medication and utilize the lowest volume of IV fluids possible, as clinically appropriate |
| ☐ | Consider preparing and dispensing medications that may be administered via IV push in ready-to-administer concentrations packaged in syringes |
| ☐ | Prolong the infusion time of IV fluids wherever applicable and consider increasing hang times or line changes from 72 to 96 hours |
| ☐ | Maximize usage of premix products to reduce IV fluids needed for reconstitution, dilution, or additional compounding |
| ☐ | For low infusion rates, utilize smaller volume bags to reduce wastage of IV fluids |
| ☐ | Optimize IV fluids during transfer between units – transfer without automatically prepping new fluids to reduce wastage, as clinically appropriate |
| ☐ | Sequester recently expired stock |
| **Communication** | |
| ☐ | Review plans to disseminate information to staff |
| ☐ | Consider utilizing the hospital or health system intranet, EMR alerts, emails, educational sessions, department and multidepartment daily huddles, notices on automatic dispensing cabinets (ADCs) or other highly visible areas, etc |

| | |
|---|---|
| ☐ | Ensure multiple avenues of information and opportunities for education exist, focusing on pertinent safety considerations |

[a]This list is not exhaustive, additional information and strategies are required for consideration.

## Oral rehydration therapy

- Worldwide, oral rehydration therapy with oral rehydration salt (ORS) solutions has been associated with a significant reduction in morbidity and mortality from acute gastroenteritis. Regardless of the cause of diarrhea, sodium-coupled glucose transportation across the apical villous membrane (followed passively by water) remains intact and forms the basis for the use of ORS solutions.[1]
- The American Academy of Pediatrics and Centers for Disease Control advocate for use of oral fluid therapy in pediatric patients presenting with dehydration due to diarrheal illness/gastrointestinal fluid losses of all etiologies.[2,3] There are few contraindications to oral hydration therapy; contraindications include hemodynamic instability, suspected ileus, and impaired protective airway reflexes.[4]
- The primary therapeutic goals of oral rehydration therapy with ORS solutions are prevention and treatment of mild to moderate dehydration in patients with acute gastroenteritis.[5]
- During oral rehydration therapy, fluid losses are replaced by administration of small, frequent volumes at rates that will optimize enteral tolerance and absorption. For patients presenting with mild to moderate dehydration, oral rehydration therapy should be administered over 4 hours. Refer to clinical pearls and Table 1 and Table 2 in Appendix 1 for fluid replacement guidelines in pediatrics and adults.[3,5]
- Oral rehydration therapy is not contraindicated in patients presenting with vomiting, but antiemetic therapy should be given for recent or active vomiting.[6]

## Oral rehydration salt solutions

- ORS solutions contain sodium, potassium, chloride, glucose and a base. The glucose facilitates the absorption of sodium (and water) in the intestine; sodium chloride and potassium chloride replace losses that occur with vomiting and diarrhea; and the base corrects acidosis.[5]
- The optimal ORS solution contains approximately equimolar concentrations of glucose and sodium to optimize absorption and has lower or similar osmolarity to plasma to avoid osmotic diarrhea.[5] The World Health Organization (WHO) standard ORS solution (Table 3, Appendix 1) is formulated to promote optimal fluid and electrolyte absorption.[7]
- Most ORS solutions in the United States (Table 3, Appendix 1) contain a lower sodium content than the WHO standard ORS solution to prevent hypernatremia. The lower sodium content also makes these solutions suitable for maintenance of hydration.[5]
- Sport drinks (Table 4, Appendix 1) are generally not appropriate for use as primary oral rehydration fluids (especially for acute diarrhea illness) because of their high glucose content, hyperosmolarity, and in some instances, low electrolyte content.[5] These may potentially be considered in select patients with mild dehydration not due to gastroenteritis.

## Resuscitation strategies

- Crystalloids contain ions (eg, sodium, chloride) that can freely pass through capillary membranes and vary in tonicity (ie, how they affect the volume of cells) based on ion concentration. Examples include normal saline and lactated ringers.[8]

- Colloids contain larger molecules that are unable to pass through capillary membranes and therefore remain within the intravascular space, exerting colloid oncotic pressure. An example of a colloid is albumin.[8]
- Crystalloids are recommended in guidelines for initial management in fluid resuscitation[9-15]
    - Balanced crystalloids (eg, lactated ringers or Plasma-lyte) are preferred instead of isotonic saline (ie, normal saline) in most cases
        - Exceptions in which isotonic saline is preferred over balanced crystalloids include traumatic brain injury, hypochloremia, metabolic alkalosis
- Crystalloids are preferred over colloids in patients with critical illness[9-14,16]
- Albumin is preferred when colloids are desired for fluid resuscitation[9-16]
    - Patients with large volume replacement requirements may benefit from combined use of crystalloids and albumin[9]
- Avoid starches, such as hydroxyethyl starch, and gelatins for resuscitation[9,10,14]

## Total parenteral nutrition (TPN) considerations

- Assess and routinely reassess each patient for parenteral nutrition (PN) indication and appropriateness. If able, provide nutrition via the oral or enteral route.[17]
- Reserve neonatal/pediatric-specific amino acids or disease-specific amino acids for the indicated patient populations.[17]
- Reserve high concentration amino acids products (e.g., greater than 10%) for fluid-restricted patients requiring PN.[17]
- Assess PN patient population to determine if standardized, commercially-available parenteral nutrition products may be appropriate for a portion of this patient population.[17]
- Compound PN in a single, central location (either in a centralized pharmacy or as outsourced preparation) in order to decrease inventory waste. Consider a supply outreach to other facilities in the nearby geographic region.[17]
- After compounding of PN, consider using remainder of stock solutions to compound smaller volume syringes or bags to decrease as much waste as possible.
- During weaning off of PN, wean dextrose and amino acids off first and leave intralipids on to wean last.
- Reduce your overfill in PN to the lowest amount possible (e.g. 50mL of overfill to 30mL).

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## Appendix 1. Oral rehydration therapy

### Clinical Pearls

- For mild to moderate dehydration, use ORS solutions (not sport drinks). If patients have minimal dehydration, may offer more palatable hydration options (dilute juice or dilute sports drink). Consider co-existing conditions that may influence selection of solutions including renal disease, diabetes, or heart failure.[5,6]
- Oral rehydration is given over 3 to 4 hours. Fluid guidelines were developed for treating patients with acute gastroenteritis. Clinical judgement with downward adjustment of hourly/total fluid intake is necessary if patients are dehydrated due to etiologies other than acute gastroenteritis (In general, intake should be equal to losses).[3,5]
    - For mild to moderate dehydration, rehydration therapy should be given as 50-100 mL/kg over 3 to 4 hours in small volumes to optimize tolerance and prevent vomiting. If tolerating small volumes, may increase volume intake (see Table 2). For simplicity, it may be easier to consider that adults can consume up to a goal of 1 L per hour and for pediatrics, up to a goal of 20 mL/kg per hour.
    - Ongoing losses due to diarrhea and vomiting should be replaced.
- For recent or acute vomiting, consider anti-emetic therapy prior to initiation of rehydration therapy.[6]
- If pain (eg, pharyngitis) limits oral intake, consider local throat anesthetics or oral pain relievers prior to initiation of rehydration therapy.[6]
- Enlist family members (or adult patients) to help with tracking total volume intake on a tracking sheet.[6]
- Patients' hydration status should be routinely assessed during oral rehydration therapy

**Table 1. Fluid guidelines for pediatrics and adults for acute gastroenteritis**[3-5]

| Degree of dehydration | Signs | Rehydration therapy | Replacement of losses |
|---|---|---|---|
| Minimal or no dehydration<br>(<3% loss of body weight) | Not applicable | Not applicable | • <10 kg body weight: 60-120 mL ORS for each diarrheal stool or vomiting episode<br>• >10 kg body weight: 120-240 mL ORS for each diarrheal stool or vomiting episode |

| Degree of dehydration | Signs | Rehydration therapy | Replacement of losses |
|---|---|---|---|
| Mild dehydration | Slightly dry mucous membranes, increased thirst | • ORS, 50-60 mL/kg body weight over 3 to 4 hours (mild) or ORS, 80-100 mL/kg body weight over 3 to 4 hours (moderate)<br>• For pediatrics, use a teaspoon, syringe, or medicine dropper to offer a limited amount (5 mL) initially and advance as tolerated.[4] For adults, use a medicine cup to offer a limited amount (30 mL) initially and advance as tolerated.[5] Too rapid advancement may cause vomiting. | As above |
| Moderate dehydration | Sunken eyes, sunken fontanels, loss of skin turgor, dry mucous membranes | | As above |
| Severe dehydration<br>(>9% loss of body weight) | Signs of moderate dehydration and ≥ 1 of the following: rapid thready pulse, cyanosis, rapid breathing, delayed capillary refill time, lethargy, coma | • IV rehydration with Lactated Ringer's solution or normal saline in 20 mL/kg body weight IV amounts until perfusion and mental status improve<br>• After improvement, may administer 100 mL/kg body weight ORS over 4 hr | As above; if no oral intake, may consider ORS administered through nasogastric tube |

**Table 2. Example of how to administer oral fluids**

| Age | Weight | Initial Dosing | Volume/h | First Advance | Next Advance |
|---|---|---|---|---|---|
| Pediatrics[4] | | | | | |
| 0-6 mo | 8 kg | 5 mL every 5 mins | 60 mL (10 mL/kg) | 15 mL every 15 mins | 30 mL every 30 mins |
| 6-12 mo | 10 kg | 10 mL every 5 mins | 120 mL (10 mL/kg) | 30 mL every 15 mins | 60 mL every 30 mins |
| 12-18 mo | 12 kg | 10 mL every 5 mins | 120 mL (10 mL/kg) | 30 mL every 15 mins | 60 mL every 30 mins |

| Age | Weight | Initial Dosing | Volume/h | First Advance | Next Advance |
|---|---|---|---|---|---|
| 18-24 mo | 13 kg | 10 mL every 5 mins | 120 mL (10 mL/kg) | 30 mL every 15 mins | 60 mL every 30 mins |
| 2-3 y | 15 kg | 10 mL every 5 mins | 120 mL (10 mL/kg) | 30 mL every 15 mins | 60 mL every 30 mins |
| 3-5 y | 20 kg | 15 mL every 5 mins | 180 mL (10 mL/kg) | 45 mL every 15 mins | 90 mL every 30 mins |
| 5-8 y | 25 kg | 15 mL every 5 mins | 180 mL (10 mL/kg) | 60 mL every 15 mins | 90 mL every 30 mins |
| 8-10 y | 35 kg | 15 mL every 2 mins | 450 mL (10 mL/kg) | 90 mL every 15 mins | 120 mL every 30 mins |
| 10-12 y | 40 kg | 15 mL every 2 mins | 450 mL (10 mL/kg) | 90 mL every 15 min | 120 mL every 30 mins |
| 12-15 y | 50 kg | 15 mL every 2 min | 450 mL (10 mL/kg) | 90 mL every 15 mins | 120 mL every 30 mins |
| Adults[6] | | | | | |
| Offer 30 mL every 3-5 mins. If well tolerated, may advance to 60 mL every 3-5 mins. | | | | | |

**Table 3. Composition of select commercial oral rehydration solutions**

| Solution | Sugar (g/L) | Sodium (mEq/L) | Potassium (mEq/L) | Chloride (mEq/L) | Osmolality (mOsm/L) | Other additives | Flavored |
|---|---|---|---|---|---|---|---|
| WHO | 13.5 | 75 | 20 | 65 | 245 | None | -- |
| Pedialyte Oral Electrolyte Solution | 25 (dextrose) | 45 | 20 | 35 | 250 | Zinc | Unflavored |

| Solution | Sugar (g/L) | Sodium (mEq/L) | Potassium (mEq/L) | Chloride (mEq/L) | Osmolality (mOsm/L) | Other additives | Flavored |
|---|---|---|---|---|---|---|---|
| Pedialyte Fast Hydration Solution | 14 | 46.9 | 20 | 45 | Not provided (NP) | Magnesium | Multiple flavors |
| Pedialyte Classic | 25 (dextrose) | 45 | 20 | 35 | 250-270 | Zinc | Unflavored and Multiple flavors |
| Pedialyte Advanced | 13 | 46.9 | 20 | 35 | 210 | Zinc, Selenium, PreActiv Prebiotics | Multiple flavors |
| Pedialyte AdvancedCare Plus | 19 | 60 | 20 | 50 | 265 | Zinc, PreActiv Prebiotics | Multiple flavors |
| GoodSense | 25 (dextrose) | 44 | 20 | 35 | NP | Zinc | Unflavored and Multiple flavors |
| Biolyte | 21 (dextrose) | 64 | 21.6 | 65.7 | NP | Vitamin C, Niacin, Vitamin B6, Vitamin B12, Pantothenic Acid, Magnesium, Ginger Root Extract, Milk Thistle Seed Extract, L-Cysteine, L-Carnitine, Glucuronolactone | Multiple flavors |

**Table 4: Composition of select commercial sports hydration fluids[a]**

| Solution | Sugar (g/L) | Sodium (mEq/L) | Potassium (mEq/L) | Osmolality (mOsm/L) | Other additives | Flavors |
|---|---|---|---|---|---|---|
| WHO | 13.5 | 75 | 20 | 245 | None | |
| Gatorade[b] | 58 | 20 | 4 | Not provided (NP), but approximately 313 | None | Multiple |
| Gatorade Zero[b] | 0 | 20 | 4 | NP | Sucralose | Multiple |
| Gatorlyte[b] | 20 | 36 | 15 | NP | Magnesium, Calcium | Multiple |
| Gatorlyte Zero[b] | 0 | 36 | 15 | NP | Magnesium, Calcium, Stevia | Multiple |
| Gatorade Water | 0 | 4 | 0 | NP | Sodium bicarbonate (pH of 7.5 or higher) | Unflavored |
| Propel Electrolyte Water[c] | 0 | 20 | 2 | NP | Vitamin C, Vitamin E, Niacin, Vitamin B6, Pantothenic Acid | Multiple |
| Body Armor | 29 | 3 | 37 | NP | Coconut water, Dipotassium Phosphate, Vitamin C Magnesium Oxide, Vitamin B3, Vitamin B5, Vitamin E, Zinc Oxide, Vitamin B6, Folic Acid, Vitamin A, Vitamin B12 | Multiple |
| Body Armor Zero Sugar | 0 | 0 | 34 | NP | Stevia, Vitamin C Magnesium Oxide, Vitamin B3, Vitamin B5, Vitamin E, Zinc Oxide, Vitamin B6, Folic Acid, Vitamin A, Vitamin B12 | Multiple |
| Body Armor Lyte | 2 | 3 | 37 | NP | Coconut water, Stevia, Dipotassium Phosphate, Vitamin C Magnesium Oxide, Vitamin B3, Vitamin B5, Vitamin E, Zinc | Multiple |

| Solution | Sugar (g/L) | Sodium (mEq/L) | Potassium (mEq/L) | Osmolality (mOsm/L) | Other additives | Flavors |
|---|---|---|---|---|---|---|
| | | | | | Oxide, Vitamin B6, Folic Acid, Vitamin A, Vitamin B12 | |
| Powerade | 59 | 29 | 6 | NP | Vitamin B12, Vitamin C, Salt, Sodium Citrate, Magnesium Chloride, Calcium Chloride, Monopotassium phosphate | Multiple |
| Powerade Zero | 0 | 29 | 6 | NP | Sucralose, Vitamin B12, Vitamin C, Magnesium Chloride, Salt, Sodium Citrate, Magnesium Chloride, Calcium Chloride, Monopotassium phosphate | Multiple |
| Smartwater | 0 | 0 | 0 | NP | Calcium Chloride, Magnesium Chloride, Potassium Bicarbonate | Unflavored |

[a] Electrolyte mEq/L calculated based on electrolyte content (mg) per serving reported in nutrition labeling. Numbers are rounded to the nearest ones; [b]Powder mix also on contract; [c] Propel Base Hydration and Propel Immune powder mix on contract

## Appendix 2. Peritoneal dialysate solutions

### Table 1. Comparison of peritoneal dialysate solutions

| Dialysate solution | Dextrose (g) per 100 mL | Osmolarity (mOsm/L) | pH | Sodium (mEq/L) | Calcium (mEq/L) | Magnesium (mEq/L) | Chloride (mEq/L) | Lactate (mEq/L) |
|---|---|---|---|---|---|---|---|---|
| **Baxter** | | | | | | | | |
| **Dianeal PD-2 with Dextrose** | | | | | | | | |
| **Dianeal PD-2 1.5% Dextrose** | 1.5 | 346 | 5.2 | 132 | 3.5 | 0.5 | 96 | 40 |
| **Dianeal PD-2 2.5% Dextrose** | 2.5 | 396 | 5.2 | 132 | 3.5 | 0.5 | 96 | 40 |

| Dialysate solution | Dextrose (g) per 100 mL | Osmolarity (mOsm/L) | pH | Sodium (mEq/L) | Calcium (mEq/L) | Magnesium (mEq/L) | Chloride (mEq/L) | Lactate (mEq/L) |
|---|---|---|---|---|---|---|---|---|
| **Dianeal PD-2 4.25% Dextrose** | 4.25 | 485 | 5.2 | 132 | 3.5 | 0.5 | 96 | 40 |
| **Dianeal Low Calcium with Dextrose** | | | | | | | | |
| **Dianeal Low Calcium 1.5% Dextrose** | 1.5 | 344 | 5.2 | 132 | 2.5 | 0.5 | 95 | 40 |
| **Dianeal Low Calcium 2.5% Dextrose** | 2.5 | 395 | 5.2 | 132 | 2.5 | 0.5 | 95 | 40 |
| **Dianeal Low Calcium 4.25% Dextrose** | 4.25 | 483 | 5.2 | 132 | 2.5 | 0.5 | 95 | 40 |
| **Extraneal** | | | | | | | | |
| **Extraneal** | NA, contains 7.5 g of icodextrin per 100 mL | 282-286 | 5.0-6.0 | 132 | 3.5 | 0.5 | 96 | 40 |
| **Fresenius Kabi** | | | | | | | | |
| **Delflex Standard with Dextrose** | | | | | | | | |
| **Delflex Standard with 1.5% Dextrose** | 1.5 | 347 | 5.5 | 132 | 3.5 | 1.5 | 102 | 35 |
| **Delflex Standard with 2.5% Dextrose** | 2.5 | 398 | 5.5 | 132 | 3.5 | 1.5 | 102 | 35 |
| **Delflex Low Magnesium, Low Calcium with Dextrose** | | | | | | | | |
| **Delflex Low Magnesium, Low Calcium with 1.5% Dextrose** | 1.5 | 344 | 5.5 | 132 | 2.5 | 0.5 | 95 | 40 |
| **Delflex Low Magnesium,** | 2.5 | 394 | 5.5 | 132 | 2.5 | 0.5 | 95 | 40 |

| Dialysate solution | Dextrose (g) per 100 mL | Osmolarity (mOsm/L) | pH | Sodium (mEq/L) | Calcium (mEq/L) | Magnesium (mEq/L) | Chloride (mEq/L) | Lactate (mEq/L) |
|---|---|---|---|---|---|---|---|---|
| **Low Calcium with 2.5% Dextrose** | | | | | | | | |
| **Delflex Low Magnesium, Low Calcium with 4.25% Dextrose** | 4.25 | 483 | 5.5 | 132 | 2.5 | 0.5 | 95 | 40 |

## Appendix 3. Select essential medications available as pre-mix products

### Table 1. Select essential medications available as ready-to-use presentations

| Medication | Dose form | Strength |
|---|---|---|
| Acetaminophen Injection | PIGGYBACK | ACETAMINOPHEN 1000MG/100ML BAG<br>ACETAMINOPHEN 500 MG/50 ML BAG |
| | SYRINGE | ACETAMINOPHEN 100 MG/10 ML SYR |
| Adenosine Injection | SYRINGE | ADENOSINE 12 MG/4 ML SYRINGE<br>ADENOSINE 6 MG/2 ML SYRINGE |
| Amiodarone HCl Injection | PLAST. BAG | AMIODARONE 450 MG/250 ML-D5W<br>AMIODARONE 900 MG/500 ML-D5W<br>NEXTERONE 150 MG/100 ML BAG<br>NEXTERONE 360 MG/200 ML BAG |
| | SYRINGE | AMIODARONE 150 MG/3 ML SYRINGE |
| Atropine Injection | SYRINGE | ATROPINE 0.25 MG/5 ML SYRINGE<br>ATROPINE 0.5 MG/5 ML ABBOJECT<br>ATROPINE 0.5 MG/5 ML SYRINGE |

| Medication | Dose form | Strength |
|---|---|---|
| | | ATROPINE 0.8 MG/2 ML SYRINGE<br>ATROPINE 1 MG/10 ML ABBOJECT<br>ATROPINE 1 MG/10 ML SYRINGE<br>ATROPINE 1 MG/2.5 ML SYRINGE<br>ATROPINE 1.2 MG/3 ML SYRINGE |
| Bupivacaine HCl / Epinephrine Injection | CARTRIDGE | MARCAINE 0.5%-EPI 1:200,000<br>VIVACAINE 0.5%-EPI 1:200,000 |
| Bupivacaine HCl Injection | PLAST. BAG | BUPIVACAINE 0.125%-0.9% NACL |
| | SYRINGE | BUPIVACAINE 0.25% (10 ML) SYRG<br>BUPIVACAINE 0.25%-NS SYRINGE |
| Calcium Chloride Injection | SYRINGE | CALCIUM CHLORIDE 1 GM/10ML SYR |
| Calcium Gluconate Injection | PLAST. BAG | CALCIUM GLU 1,000MG/100ML-NACL<br>CALCIUM GLU 2,000MG/100ML-NACL<br>CALCIUM GLUC 1 G/100-0.9% NACL<br>CALCIUM GLUC 1,000MG/50ML-NACL |
| | SYRINGE | CALCIUM GLU 1,000MG/10ML-WATER |
| Cefazolin Sodium Injection | BULKBAGINJ | CEFAZOLIN SOD 100 GM BULK BAG<br>CEFAZOLIN SOD 300 GM BULK BAG |
| | FROZ.PIGGY | CEFAZOLIN 1 G/50 ML-DEXTROSE<br>CEFAZOLIN 2 G/100 ML-DEXTROSE<br>CEFAZOLIN 3 G/150 ML-DEXTROSE |
| | PIGGYBACK | CEFAZOLIN 1 G/50 ML-DEXTROSE<br>CEFAZOLIN 2 G/50 ML-DEXTROSE<br>CEFAZOLIN 3 G/100 ML-0.9% NACL |
| | PLAST. BAG | CEFAZOLIN 2 G/100 ML-0.9% NACL |

| Medication | Dose form | Strength |
|---|---|---|
| | | CEFAZOLIN 2 GRAM/100 ML-D5W |
| | SYRINGE | CEFAZOLIN 1 G/10 ML-WATER SYRG<br>CEFAZOLIN 2 G/20 ML-WATER SYRG<br>CEFAZOLIN 3 G/30 ML-WATER SYRG |
| Cefepime HCl Injection | BULKBAGINJ | CEFEPIME HCL 100 GRAM SMARTPAK |
| | FROZ.PIGGY | CEFEPIME 1 GM INJECTION<br>CEFEPIME 2 GM INJECTION |
| | PIGGYBACK | CEFEPIME-DEXTROSE 1 GM/50 ML<br>CEFEPIME-DEXTROSE 2 GM/50 ML |
| Ceftriaxone Sodium Injection | BULKBAGINJ | CEFTRIAXONE 100 GRAM BULK BAG |
| | FROZ.PIGGY | CEFTRIAXONE 1 GM PIGGYBACK<br>CEFTRIAXONE 2 GM PIGGYBACK |
| | PIGGYBACK | CEFTRIAXONE 1 GM-D5W BAG<br>CEFTRIAXONE 2 GM-D5W BAG |
| Ciprofloxacin Injection[a] | PIGGYBACK | CIPROFLOXACIN 200 MG/100ML-D5W<br>CIPROFLOXACIN 400 MG/200ML-D5W |
| Clindamycin Phosphate Injection | PGGYBK BTL | CLINDAMYCIN 300 MG/50 ML-D5W<br>CLINDAMYCIN 600 MG/50 ML-D5W<br>CLINDAMYCIN 900 MG/50 ML-D5W |
| | PIGGYBACK | CLINDAMYCIN 300 MG/50 ML-D5W<br>CLINDAMYCIN 300 MG/50 ML-NS<br>CLINDAMYCIN 600 MG/50 ML-D5W<br>CLINDAMYCIN 600 MG/50 ML-NS<br>CLINDAMYCIN 900 MG/50 ML-D5W<br>CLINDAMYCIN 900 MG/50 ML-NS |

| Medication | Dose form | Strength |
|---|---|---|
| Dexamethasone Sodium Phosphate Injection | SYRINGE | DEXAMETHASONE 10 MG/ML SYRING<br>DEXAMETHASONE 4 MG/ML SYRINGE |
| Dexmedetomidine HCl Injection | INFUS. BTL | DEXMEDETOMIDIN 400MCG/100ML-NS<br>DEXMEDETOMIDINE 200MCG/50ML-NS<br>PRECEDEX 1,000 MCG/250 ML BTL<br>PRECEDEX 200 MCG/50 ML BOTTLE<br>PRECEDEX 400 MCG/100 ML BOTTLE |
| | PLAST. BAG | DEXMEDETOMIDIN 200MCG/50ML-D5W<br>DEXMEDETOMIDIN 400MCG/100ML-NS<br>DEXMEDETOMIDINE 200MCG/50ML-NS<br>DEXMEDETOMIDN 400MCG/100ML-D5W |
| | SYRINGE | DEXMEDETOMIDINE 20 MCG/5 ML-NS |
| Diazepam Injection | CARTRIDGE | DIAZEPAM 10 MG/2 ML CARPUJECT |
| | SYRINGE | DIAZEPAM 10 MG/2 ML SYRINGE |
| Diltiazem HCl Injection | PLAST. BAG | DILTIAZEM 125 MG/125 ML-D5W<br>DILTIAZEM 125MG/125ML-0.7%NACL<br>DILTIAZEM 125MG/125ML-0.9%NACL |
| Diphenhydramine HCl Injection | SYRINGE | DIPHENHYDRAMINE 50 MG/ML SYRNG |
| Dobutamine HCl Injection | IV SOLN | DOBUTAMINE 1,000 MG/250 ML D5W<br>DOBUTAMINE 250 MG/250 ML-D5W<br>DOBUTAMINE 500 MG/250 ML D5W |
| Dopamine HCl Injection | PLAST. BAG | DOPAMINE 200 MG-D5W 250 ML<br>DOPAMINE 400 MG/250 ML-D5W BAG<br>DOPAMINE 400 MG-D5W 500 ML<br>DOPAMINE 800 MG/250 ML-D5W BAG<br>DOPAMINE 800 MG/500 ML-D5W BAG |

| Medication | Dose form | Strength |
|---|---|---|
| | SYRINGEKIT | ENOXILUV KIT |
| Ephedrine Injection | SYRINGE | AKOVAZ 25 MG/5 ML SYRINGE<br>EMERPHED 25 MG/5 ML SYRINGE<br>EMERPHED 50 MG/10 ML SYRINGE<br>EPHEDRINE 10 MG/ML-0.9% NACL<br>EPHEDRINE 100 MG/10ML-0.9%NACL<br>EPHEDRINE 15 MG/3 ML-0.9% NACL<br>EPHEDRINE 25 MG/5 ML SYRINGE<br>EPHEDRINE 25 MG/5 ML-0.9% NACL<br>EPHEDRINE 50 MG/10 ML-0.9%NACL<br>EPHEDRINE 50 MG/10 ML-NACL SYR<br>EPHEDRINE 50 MG/10ML-0.9% NACL<br>EPHEDRINE 50 MG/5 ML-0.9% NACL<br>EPHEDRINE 50 MG/5 ML-NACL SYRN |
| Epinephrine Injection | PLAST. BAG | EPINEPH 8 MG/250 ML-0.9% NACL<br>EPINEPHRINE 2 MG/250 ML-D5W<br>EPINEPHRINE 2 MG/250 ML-NS<br>EPINEPHRINE 4 MG/250 ML-D5W<br>EPINEPHRINE 4 MG/250 ML-NS<br>EPINEPHRINE 5 MG/250 ML-D5W |
| | SYRINGE | EPINEPH 0.1 MG/10 ML-0.9% NACL<br>EPINEPHRINE 1 MG/10 ML ABBOJCT<br>EPINEPHRINE 1 MG/10 ML LUERJET<br>EPINEPHRINE 1 MG/10 ML-NS SYR<br>EPINEPHRINE 100 MCG/10 ML-D5W<br>SYMJEPI 0.15 MG/0.3 ML SYRINGE<br>SYMJEPI 0.3 MG/0.3 ML SYRINGE |
| Eptifibatide Injection | PLAST. BAG | EPTIFIBATIDE 75 MG/100 ML BAG |

| Medication | Dose form | Strength |
|---|---|---|
| Famotidine Injection | PIGGYBACK | FAMOTIDINE 20 MG PIGGYBACK |
| Fentanyl Citrate Injection | PLAST. BAG | FENTANYL 1 MG/100 ML-0.9% NACL<br>FENTANYL 1,000MCG/100-0.9%NACL<br>FENTANYL 1,000MCG/50-0.9% NACL<br>FENTANYL 1,250MCG/250-0.9%NACL<br>FENTANYL 1,600MCG/100-0.9%NACL<br>FENTANYL 2,000MCG/100-0.9%NACL<br>FENTANYL 2,500 MCG/50 ML BAG<br>FENTANYL 2,500 MCG/50 ML-WATER<br>FENTANYL 2,500 MCG/50-0.9%NACL<br>FENTANYL 2,500MCG/100-0.9%NACL<br>FENTANYL 2,500MCG/250-0.9%NACL<br>FENTANYL 2.5MG/250ML-0.9% NACL<br>FENTANYL 5,000 MCG/100 ML BAG<br>FENTANYL 5,000 MCG/100ML-WATER |
| | SYRINGE | FENTANYL 10 MCG/ML-0.9% NACL<br>FENTANYL 100 MCG/10ML-0.9%NACL<br>FENTANYL 100 MCG/2 ML SYRINGE<br>FENTANYL 100 MCG/2 ML-0.9%NACL<br>FENTANYL 20 MCG/2 ML-0.9% NACL<br>FENTANYL 25 MCG/0.5 ML SYRINGE<br>FENTANYL 250 MCG/5 ML SYRINGE<br>FENTANYL 50 MCG/ML SYRINGE<br>FENTANYL 50 MCG/ML-0.9% NACL |
| Fluconazole Injection[a] | PIGGYBACK | FLUCONAZOLE-NACL 100 MG/50 ML<br>FLUCONAZOLE-NACL 200 MG/100 ML<br>FLUCONAZOLE-NACL 400 MG/200 ML |
| Gentamicin Sulfate Injection | PIGGYBACK | ISO GENTAMICIN 100 MG/100 ML<br>ISO GENTAMICIN 120 MG/100 ML<br>ISOTON GENTAMICIN 100 MG/50 ML<br>ISOTON GENTAMICIN 60 MG/50 ML<br>ISOTON GENTAMICIN 80 MG/100 ML |

| Medication | Dose form | Strength |
|---|---|---|
| | | ISOTON GENTAMICIN 80 MG/50 ML |
| Glucagon Injection | AUTO INJCT | GVOKE HYPOPEN 1PK 0.5MG/0.1 ML<br>GVOKE HYPOPEN 1-PK 1 MG/0.2 ML<br>GVOKE HYPOPEN 2PK 0.5MG/0.1 ML<br>GVOKE HYPOPEN 2-PK 1 MG/0.2 ML |
| | SYRINGE | GVOKE PFS 1-PK 1 MG/0.2 ML SYR<br>GVOKE PFS 2-PK 1 MG/0.2 ML SYR |
| Glycopyrrolate Injection | SYRINGE | GLYCOPYRROLATE 0.2 MG/ML SYRNG<br>GLYCOPYRROLATE 0.4 MG/2 ML SYR<br>GLYCOPYRROLATE 0.6 MG/3 ML SYR<br>GLYCOPYRROLATE 0.6MG/3ML-WATER<br>GLYCOPYRROLATE 1 MG/5 ML SYRNG<br>GLYRX-PF 0.6 MG/3 ML SYRINGE<br>GLYRX-PF 1 MG/5 ML SYRINGE |
| Haloperidol Injection | SYRINGE | HALOPERIDOL LAC 5 MG/ML SYRING |
| Heparin Sodium Injection | CARTRIDGE | HEPARIN 5,000 UNIT/ML CARPUJCT<br>HEPARIN SOD 5,000 UNIT/0.5 ML |
| | IV SOLN | HEPARIN 1,000 UNIT/500 ML-NS<br>HEPARIN 12,500 UNIT/250-1/2 NS<br>HEPARIN 2,000 UNIT/1,000 ML-NS<br>HEPARIN 2,500 UNIT/500 ML-NS<br>HEPARIN 20,000 UNIT/500 ML-D5W<br>HEPARIN 25,000 UNIT/250 ML-D5W<br>HEPARIN 25,000 UNIT/250-1/2 NS<br>HEPARIN 25,000 UNIT/500 ML-D5W<br>HEPARIN 25,000 UNIT/500-1/2 NS<br>HEPARIN 30,000 UNIT/1,000-NS<br>HEPARIN 5,000 UNIT/1,000 ML-NS<br>HEPARIN 5,000 UNIT/500 ML-NS |
| | SYRINGE | HEPARIN 20 UNIT/20 ML-NS SYRNG |

| Medication | Dose form | Strength |
|---|---|---|
| | | HEPARIN 50 UNIT/50 ML-NS SYRNG<br>HEPARIN SOD 5,000 UNIT/0.5 ML<br>HEPARIN SOD 5,000 UNIT/ML SYRG |
| Hydromorphone HCl Injection | CARTRIDGE | HYDROMORPHONE 1 MG/ML CARPUJCT<br>HYDROMORPHONE 2 MG/ML CARPUJCT<br>HYDROMORPHONE 4 MG/ML CARPUJCT |
| | PLAST. BAG | HYDROMORPHONE 10 MG/50 ML-NS<br>HYDROMORPHONE 20 MG/100 ML-NS<br>HYDROMORPHONE 25 MG/50 ML-NS<br>HYDROMORPHONE 50 MG/50 ML-NS |
| | SYRINGE | DILAUDID 0.2 MG/ML SYRINGE<br>DILAUDID 0.5 MG/0.5 ML SYRINGE<br>DILAUDID 1 MG/ML SYRINGE<br>DILAUDID 2 MG/ML SYRINGE<br>HYDROMORPHONE 0.25 MG/0.5 ML<br>HYDROMORPHONE 0.5 MG/0.5 ML<br>HYDROMORPHONE 0.5 MG/0.5ML SYR<br>HYDROMORPHONE 1 MG/5 ML-NS<br>HYDROMORPHONE 1 MG/ML SYRINGE<br>HYDROMORPHONE 1 MG/ML-NS SYRNG<br>HYDROMORPHONE 2 MG/ML SYRINGE<br>HYDROMORPHONE 2 MG/ML-NS SYRNG |
| Ibuprofen Injection | PIGGYBACK | CALDOLOR 800 MG/200 ML BAG |
| Insulin Regular (Human) Injection | PLAST. BAG | MYXREDLIN 100 UNIT/100 ML BAG |
| Ketamine HCl Injection | INFUS. BTL | KETAMINE 100 MG/100ML-0.9%NACL |
| | PLAST. BAG | KETAMINE 1,000 MG/100-0.9%NACL<br>KETAMINE 1,250 MG/250-0.9%NACL<br>KETAMINE 200 MG/200 ML-NS BAG<br>KETAMINE 30 MG/50 ML-0.9% NACL<br>KETAMINE 500 MG/250ML-0.9%NACL |

| Medication | Dose form | Strength |
|---|---|---|
| | SYRINGE | KETAMINE 10 MG/ML-0.9% NACL<br>KETAMINE 100 MG/10 ML-0.9%NACL<br>KETAMINE 100 MG/2 ML SYRINGE<br>KETAMINE 100 MG/2 ML-WATER SYR<br>KETAMINE 20 MG/2 ML-0.9% NACL<br>KETAMINE 20 MG/2 ML-NACL SYRNG<br>KETAMINE 30 MG/3 ML-NACL SYRNG<br>KETAMINE 50 MG/5 ML-0.9% NACL<br>KETAMINE 50 MG/5 ML-NACL SYRNG<br>KETAMINE 50 MG/ML-WATER SYRING<br>KETAMINE HCL 50 MG/ML SYRINGE |
| Labetalol HCl Injection | CARTRIDGE | LABETALOL HCL 20 MG/4 ML CRPJT |
| | SYRINGE | LABETALOL HCL 10 MG/2 ML SYRNG<br>LABETALOL HCL 20 MG/4 ML SYRNG |
| Levetiracetam Injection | PIGGYBACK | LEVETIRACETAM-NACL 1,000MG/100<br>LEVETIRACETAM-NACL 1,500MG/100<br>LEVETIRACETAM-NACL 250 MG/50ML<br>LEVETIRACETAM-NACL 500 MG/100 |
| Levofloxacin Injection | PIGGYBACK | LEVOFLOXACIN 250 MG/50 ML-D5W<br>LEVOFLOXACIN 500 MG/100 ML-D5W<br>LEVOFLOXACIN 750 MG/150 ML-D5W |
| Lidocaine HCl / Epinephrine Injection | CARTRIDGE | LIDOCAINE 2%-EPI 1:100,000<br>LIDOCAINE 2%-EPI 1:50,000 CART<br>LIGNOSPAN SD 2%-EPI 1:100,000<br>XYLOCAINE 2%-EPI 1:100,000<br>XYLOCAINE 2%-EPI 1:50,000 CART |
| | SYRINGE | BUFFERED LIDOCAINE 0.5%-EPINEP |
| Lidocaine HCl Injection | IV SOLN | LIDOCAINE 0.4% IN D5W SOLN<br>LIDOCAINE 0.8% IN D5W SOLN |

| Medication | Dose form | Strength |
|---|---|---|
| | SYRINGE | BUFFERED LIDOCAINE 1% SYRINGE<br>LIDOCAINE 100 MG/10 ML(1%) SYR<br>LIDOCAINE 100 MG/5 ML (2%) SYR<br>LIDOCAINE 100MG/10ML-0.9% NACL<br>LIDOCAINE 200 MG/10 ML(2%) SYR<br>LIDOCAINE 30 MG/3 ML (1%) SYRG<br>LIDOCAINE HCL 1% ABBOJECT<br>LIDOCAINE HCL 1% SYRINGE<br>LIDOCAINE HCL 2% ABBOJECT<br>LIDOCAINE HCL 2% LUER-JET<br>LIDOCAINE HCL 2% SYRINGE<br>LIDOCAINE HCL 200 MG/10 ML SYR |
| Linezolid Injection[a] | PIGGYBACK | LINEZOLID 600 MG/300 ML-D5W<br>LINEZOLID 600MG/300ML-0.9%NACL<br>ZYVOX 200 MG/100 ML-D5W<br>ZYVOX 600 MG/300 ML-D5W |
| Lorazepam Injection | CARTRIDGE | LORAZEPAM 2 MG/ML CARPUJECT |
| Magnesium Sulfate Injection | IV SOLN | MAGNESIUM SULF 20 G/500 ML BAG<br>MAGNESIUM SULF 40 G/1,000 ML |
| | PIGGYBACK | MAGNESIUM SULF 1 G/100 ML-D5W<br>MAGNESIUM SULF 2 G/50 ML BAG<br>MAGNESIUM SULF 4 G/100 ML BAG<br>MAGNESIUM SULF 4 G/50 ML BAG |
| | SYRINGE | MAGNESIUM SULFATE 50% SYRINGE |
| Meropenem Injection | PIGGYBACK | MEROPENEM-0.9% NACL 1 GRAM/50<br>MEROPENEM-0.9% NACL 500 MG/50 |
| Methylene Blue Injection | SYRINGE | METHYLENE BLUE 1% (20 MG/2 ML) |
| Metronidazole Injection[a] | PIGGYBACK | METRO IV 500 MG/100 ML<br>METRONIDAZOLE 500 MG/100 ML |

| Medication | Dose form | Strength |
|---|---|---|
| Midazolam HCl Injection | INFUS. BTL | MIDAZOLAM 100 MG/100 ML BOTTLE<br>MIDAZOLAM 50 MG/50 ML BOTTLE |
| | PLAST. BAG | MIDAZOLAM 100MG/100ML-0.9%NACL<br>MIDAZOLAM 50 MG/50 ML-0.9%NACL<br>MIDAZOLAM 50 MG/50 ML-NACL BAG |
| | SYRINGE | MIDAZOLAM 10 MG/2 ML SYRINGE<br>MIDAZOLAM 150 MG/30 ML SYRINGE<br>MIDAZOLAM 2 MG/2 ML SYRINGE<br>MIDAZOLAM 2 MG/2 ML-0.9% NACL<br>MIDAZOLAM 25 MG/25 ML-NACL SYR<br>MIDAZOLAM 5 MG/5 ML-0.9% NACL<br>MIDAZOLAM 5 MG/ML SYRINGE<br>MIDAZOLAM 50 MG/50 ML-0.9%NACL<br>MIDAZOLAM 50 MG/50 ML-NACL SYR<br>MIDAZOLAM 55 MG/55 ML-0.9%NACL |
| Milrinone Lactate Injection | PIGGYBACK | MILRINONE-D5W 20 MG/100 ML<br>MILRINONE-D5W 40 MG/200 ML |
| Morphine Sulfate Injection | CARTRIDGE | MORPHINE 10 MG/ML CARPUJECT<br>MORPHINE 2 MG/ML CARPUJECT<br>MORPHINE 4 MG/ML CARPUJECT<br>MORPHINE 8 MG/ML CARPUJECT |
| | PLAST. BAG | MORPHINE 100MG/100ML-0.9% NACL<br>MORPHINE 50 MG/50 ML-0.9% NACL<br>MORPHINE 500MG/100ML-0.9% NACL |
| | SYRINGE | MORPHINE 1 MG/2 ML SYRINGE<br>MORPHINE 1 MG/ML-0.9% NACL SYR<br>MORPHINE 10 MG/ML SYRINGE<br>MORPHINE 2 MG/2 ML-0.9% NACL<br>MORPHINE 2 MG/2 ML-NACL SYRING<br>MORPHINE 2 MG/ML SYRINGE<br>MORPHINE 2 MG/ML-0.9% NACL SYR |

| Medication | Dose form | Strength |
|---|---|---|
| | | MORPHINE 4 MG/ML SYRINGE<br>MORPHINE 4 MG/ML-0.9% NACL SYR<br>MORPHINE 5 MG/5 ML-0.9% NACL |
| Moxifloxacin Injection[a] | PIGGYBACK | MOXIFLOXACIN 400 MG/250 ML BAG |
| Naloxone HCl Injection | AUTO INJCT | NALOXONE 10 MG AUTO-INJECTOR |
| | CARTRIDGE | NALOXONE 0.4 MG/ML CARPUJECT |
| | SYRINGE | NALOXONE 0.4 MG/ML SYRINGE<br>NALOXONE 2 MG/2 ML SYRINGE<br>ZIMHI 5 MG/0.5 ML SYRINGE |
| Neostigmine Methylsulfate Injection | SYRINGE | NEOSTIGMINE 2 MG/2 ML SYRINGE<br>NEOSTIGMINE 3 MG/3 ML SYRINGE<br>NEOSTIGMINE 3 MG/3 ML-WATER<br>NEOSTIGMINE 4 MG/4 ML SYRINGE<br>NEOSTIGMINE 5 MG/5 ML SYRINGE<br>NEOSTIGMINE 5 MG/5 ML-WATER |
| Nicardipine HCl Injection | PIGGYBACK | CARDENE-NACL 20 MG/200 ML SOLN<br>CARDENE-NACL 40 MG/200 ML IV<br>NICARDIPIN 20MG/200ML-0.9%NACL<br>NICARDIPIN 40MG/200ML-0.9%NACL |
| | SYRINGE | NICARDIPINE 1 MG/10 ML-NS SYRG |
| Nitroglycerin Injection | INFUS. BTL | NTG 0.2 MG/ML IN D5W<br>NTG 100 MG/250 ML IN D5W<br>NTG 25 MG/250 ML IN D5W |
| Norepinephrine Bitartrate Injection | INFUS. BTL | NOREPINEPH 16 MG/250-0.9% NACL<br>NOREPINEPHR 4 MG/250-0.9% NACL<br>NOREPINEPHR 8 MG/250-0.9% NACL |
| | PLAST. BAG | NOREPINEPH 16 MG/250-0.9% NACL<br>NOREPINEPH 32 MG/250-0.9% NACL |

| Medication | Dose form | Strength |
|---|---|---|
| | | NOREPINEPHR 4 MG/250-0.9% NACL<br>NOREPINEPHR 8 MG/250-0.9% NACL<br>NOREPINEPHR 8 MG/500-0.9% NACL<br>NOREPINEPHRINE 16 MG/250ML-D5W<br>NOREPINEPHRINE 4 MG/250 ML-D5W<br>NOREPINEPHRINE 8 MG/250 ML-D5W<br>NOREPINEPHRINE 8 MG/500 ML-D5W |
| Octreotide Acetate Injection | SYRINGE | OCTREOTIDE ACET 100 MCG/ML SYR<br>OCTREOTIDE ACET 50 MCG/ML SYR<br>OCTREOTIDE ACET 500 MCG/ML SYR |
| Ondansetron HCl Injection | SYRINGE | ONDANSETRON HCL 4 MG/2 ML SYR |
| Oxytocin Injection | PLAST. BAG | OXYTOCIN 15 UNIT/250 ML-LR<br>OXYTOCIN 20 UNIT/1,000 ML-LR<br>OXYTOCIN 20 UNIT/1,000 ML-NS<br>OXYTOCIN 30 UNIT/500 ML-LR<br>OXYTOCIN 30 UNIT/500 ML-NS |
| Penicillin G Injection | FROZ.PIGGY | PEN G K 2 MILLION UNIT/50 ML<br>PEN G K 3 MILLION UNIT/50 ML |
| | SYRINGE | BICILLIN C-R 1.2 MILLION UNIT<br>BICILLIN C-R 900-300 SYRINGE<br>BICILLIN L-A 1,200,000 UNITS<br>BICILLIN L-A 2,400,000 UNITS<br>BICILLIN L-A 600,000 UNIT/ML |
| Phenylephrine HCl Injection | PLAST. BAG | PHENYLEPHRINE 10 MG/250 ML-NS<br>PHENYLEPHRINE 100 MG/250 ML-NS<br>PHENYLEPHRINE 20 MG/250 ML-NS<br>PHENYLEPHRINE 200MG/250ML-NACL<br>PHENYLEPHRINE 25 MG/250 ML-NS<br>PHENYLEPHRINE 40 MG/250 ML-NS<br>PHENYLEPHRINE 50 MG/250 ML-NS<br>PHENYLEPHRINE 80 MG/250 ML-NS |

| Medication | Dose form | Strength |
|---|---|---|
| | SYRINGE | PHENYLEPHRINE 0.4 MG/10 ML-NS<br>PHENYLEPHRINE 0.5 MG/5 ML-NS<br>PHENYLEPHRINE 0.8 MG/10 ML-NS<br>PHENYLEPHRINE 1 MG/10 ML-NS<br>PHENYLEPHRINE 1,000MCG/10ML-NS<br>PHENYLEPHRINE 20 MG/50 ML-NS<br>PHENYLEPHRINE 400 MCG/10 ML-NS<br>PHENYLEPHRINE 5,000MCG/50ML-NS<br>PHENYLEPHRINE 500 MCG/5 ML-NS<br>PHENYLEPHRINE 800 MCG/10 ML-NS |
| Phytonadione (Vit K) Injection | SYRINGE | PHYTONADIONE 1 MG/0.5 ML SYR |
| Piperacillin Sodium/Tazobactam Sodium Injection | FROZ.PIGGY | ZOSYN 2.25 GM/50 ML GALAXY BAG<br>ZOSYN 3.375 GM/50 ML GALAXY<br>ZOSYN 4.5 GM/100 ML GALAXY BAG |
| Potassium Chloride Injection | IV SOLN | KCL 10 MEQ/500ML-D5W-0.45%NACL<br>KCL 10 MEQ/L IN D5W SOLUTION<br>KCL 10 MEQ/L-D5W-0.45% NACL<br>KCL 10MEQ/500ML-D5W-0.225%NACL<br>KCL 20 MEQ IN D5W-LACT RINGER<br>KCL 20 MEQ/L IN D5W SOLUTION<br>KCL 20 MEQ/L-D5W-0.2% NACL<br>KCL 20 MEQ/L-D5W-0.225% NACL<br>KCL 20 MEQ/L-D5W-0.45% NACL<br>KCL 20 MEQ/L-D5W-0.9% NACL<br>KCL 30 MEQ/L-D5W-0.45% NACL<br>KCL 40 MEQ/L-D5W-0.45% NACL<br>KCL 40 MEQ/L-D5W-0.9% NACL<br>POTASSIUM CL 2 MEQ/ML CONC<br>POTASSIUM CL 20 MEQ/1,000ML-NS<br>POTASSIUM CL 20 MEQ/250 ML-NS<br>POTASSIUM CL 20 MEQ-0.45% NACL<br>POTASSIUM CL 40 MEQ/1,000ML-NS |

| Medication | Dose form | Strength |
|---|---|---|
| | | POTASSIUM CL 40 MEQ/500 ML-NS |
| | PIGGYBACK | POTASSIUM CL 10 MEQ/100 ML SOL<br>POTASSIUM CL 10 MEQ/50 ML SOL<br>POTASSIUM CL 20 MEQ/100 ML SOL<br>POTASSIUM CL 20 MEQ/50 ML SOL<br>POTASSIUM CL 40 MEQ/100 ML SOL |
| | SYRINGE | POTASSIUM CL CONC 100 MEQ/50ML |
| Potassium Phosphate Injection | PLAST. BAG | POTASSIUM PH 15 MMOL/250 ML-NS |
| Rocuronium Bromide Injection | SYRINGE | ROCURONIUM 100 MG/10 ML SYR<br>ROCURONIUM 50 MG/5 ML SYRINGE<br>ROCURONIUM 75 MG/7.5 ML SYRING |
| Ropivacaine HCl Injection | INFUS. BTL | NAROPIN 0.2% 200 MG/100 ML BTL<br>NAROPIN 0.2% 400 MG/200 ML BTL<br>NAROPIN 0.5% 1,000 MG/200 ML<br>NAROPIN 0.5% 500 MG/100 ML BTL<br>ROPIVACAINE 0.2% 200 MG/100 ML |
| | PLAST. BAG | NAROPIN 0.2% 200 MG/100 ML BAG<br>NAROPIN 0.2% 400 MG/200 ML BAG<br>ROPIVACAINE 0.15%-0.9% NACL<br>ROPIVACAINE 0.2% 200 MG/100 ML<br>ROPIVACAINE 0.2% 400 MG/200 ML<br>ROPIVACAINE 0.2%-0.9% NACL BAG<br>ROPIVACAINE 0.2%-NACL BAG<br>ROPIVACAINE 0.5% 1000 MG/200ML<br>ROPIVACAINE 0.5% 500 MG/100 ML |
| | SYRINGE | ROPIVACAINE HCL 0.5% SYRINGE |
| Sodium Bicarbonate Injection | SYRINGE | SODIUM BICARB 4.2% ABBOJECT<br>SODIUM BICARB 7.5% ABBOJECT<br>SODIUM BICARB 8.4% ABBOJECT |

| Medication | Dose form | Strength |
|---|---|---|
| | | SODIUM BICARB 8.4% SYRINGE<br>SODIUM BICARBONATE 8.4%-WATER |
| Succinylcholine Chloride Injection | SYRINGE | SUCCINYLCHOL 100 MG/5 ML-NACL<br>SUCCINYLCHOL 140 MG/7 ML-NACL<br>SUCCINYLCHOL 200 MG/10 ML-NACL<br>SUCCINYLCHOLINE 100 MG/5 ML<br>SUCCINYLCHOLINE 100 MG/5ML SYR<br>SUCCINYLCHOLINE 140 MG/7 ML<br>SUCCINYLCHOLINE 200 MG/10 ML |
| Tirofiban HCl Injection | PLAST. BAG | AGGRASTAT 12.5 MG/250 ML BAG<br>AGGRASTAT 5 MG/100 ML BAG<br>TIROFIBAN 12.5 MG/250 ML BAG<br>TIROFIBAN 5 MG/100 ML BAG |
| Tranexamic Acid Injection | PIGGYBACK | TRANEXAMIC 1,000 MG/100ML-NACL |
| Vancomycin HCl Injection | BULKBAGINJ | VANCOMYCIN HCL 100 GM SMARTPAK |
| | FROZ.PIGGY | VANCO 500 MG/100 ML-0.9% NACL<br>VANCO 750 MG/150 ML-0.9% NACL<br>VANCOMYCIN 1 G/200ML-0.9% NACL<br>VANCOMYCIN 1.25 GRAM/250ML-D5W<br>VANCOMYCIN 1.5 GRAM/300 ML-D5W<br>VANCOMYCIN 750 MG/150 ML BAG<br>VANCOMYCIN HCL 1G/200 ML BAG<br>VANCOMYCIN-D5W 500 MG/100 ML |
| | PLAST. BAG | VANCO 1 GRAM/250 ML-0.9% NACL<br>VANCO 1.25 GM/250 ML-0.9% NACL<br>VANCO 1.5 GM/250 ML-0.9% NACL<br>VANCO 1.5 GM/500 ML-0.9% NACL<br>VANCO 1.75 G/250 ML-0.9% NACL<br>VANCO 1.75 GM/500 ML-0.9% NACL<br>VANCO 2 GRAM/500 ML-0.9% NACL<br>VANCO 750 MG/150 ML-0.9% NACL |

| Medication | Dose form | Strength |
|---|---|---|
| | | VANCO 750 MG/250 ML-0.9% NACL<br>VANCOMYCIN 1.25 GRAM/250ML-D5W<br>VANCOMYCIN 1.5 GRAM/250 ML-D5W |
| Vasopressin Injection | INFUS. BTL | VASOPRESSIN 20 UNIT/100 ML-NS<br>VASOPRESSIN 40 UNIT/100 ML-NS<br>VASOSTRICT 20 UNIT/100 ML VIAL<br>VASOSTRICT 40 UNIT/100 ML VIAL |
| | PLAST. BAG | VASOPRESSIN 20 UNIT/100 ML-NS<br>VASOPRESSIN 40 UNIT/100 ML-NS |
| | SYRINGE | VASOPRESSIN 2 UNIT/2 ML-NS |
| Vecuronium Bromide Injection | SYRINGE | VECURONIUM 10 MG/10 ML-WATER |
| Zoledronic Acid Injection | PGGYBK BTL | ZOLEDRONIC ACID 4 MG/100 ML<br>ZOLEDRONIC ACID 5 MG/100 ML |
| | PIGGYBACK | ZOLEDRONIC ACID 4 MG/100 ML<br>ZOLEDRONIC ACID 5 MG/100 ML |

[a] Medications only available as ready-to-use products

## Appendix 4. Surgical irrigation solutions

### Table 1. Comparison of surgical irrigation solutions

| | Bactisure Wound Lavage | Irrisept Antimicrobial Wound Lavage | Surgiphor Antimicrobial Irrigation System | Xperience Advanced Surgical Irrigation |
|---|---|---|---|---|
| **Manufacturer** | Zimmer Biomet | Irrimax | Becton Dickinson | Zimmer Biomet |
| **FDA 510(k) number** | K192349 | K240552 | K221504 | K203835 |

| | Bactisure Wound Lavage | Irrisept Antimicrobial Wound Lavage | Surgiphor Antimicrobial Irrigation System | Xperience Advanced Surgical Irrigation |
|---|---|---|---|---|
| **Indication for use** | Intended for use with the Zimmer Pulsavac Plus or Pulsavac Plus AC lavage systems and is indicated for use in cleansing and removal of debris, including micro-organisms, from wounds. | Intended for mechanical cleansing and removal of debris, dirt and foreign materials, including microorganisms, from wounds. | Intended to mechanically loosen and remove debris, and foreign materials, including microorganisms, from wounds. | Intended for use in cleansing and removal of debris, including microorganisms from wounds. |
| **Requires rinsing after application** | Yes, immediately rinse with an equal amount of normal saline using pulsed lavage | No | Yes, immediately rinse with normal saline after irrigation | No |
| **For use with wound lavage system** | Yes | Yes, and can be administered manually | No | Yes, and can be administered with a manual syringe |
| **How supplied** | 1000 mL polypropylene plastic bag with an integrated single spike port | 450 mL bottle with spikeable cap | 450 mL bottle | 500 mL polypropylene plastic container with a spikeable port |
| **Composition** | • Ethanol, 100 g/L<br>• Acetic acid, 59 g/L<br>• Sodium acetate, 30 g/L<br>• Benzalkonium chloride, 1.3 g/L<br>• Water | 0.05% chlorhexidine gluconate in 99.95% sterile water for irrigation | 0.5% povidone iodine plus vitamin E TPGS in 0.9% saline | • Sodium citrate, 31.33 g/L<br>• Citric acid, 32.50 g/L<br>• Sodium lauryl sulfate, 1.00 g/L<br>• Water |
| **Mechanism of action** | Mechanical removal of debris via hydrodynamic shear.<br>The mechanical action of moving across the wound aids | The mechanical action of fluid across the wound removes wound debris. The mechanical action of the irrigation can be by manual or powered irrigation. | The mechanical action of fluid across the wound removes wound debris, including microorganisms. | Mechanical removal of debris via hydrodynamic shear.<br>The mechanical action of moving across the wound aids in the removal of foreign |

| | Bactisure Wound Lavage | Irrisept Antimicrobial Wound Lavage | Surgiphor Antimicrobial Irrigation System | Xperience Advanced Surgical Irrigation |
|---|---|---|---|---|
| | in the removal of foreign material such as dirt and debris. | | | material such as, microorganisms, dirt and debris.<br><br>The mechanical action can be provided by either a manual syringe or powered irrigation device. |

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