

Enterprise IV Fluid Management Strategies



The approved Enterprise Intravenous Fluid Management Strategies are considered standard practice and should be followed accordingly to ensure clinically appropriate and judicious use of our IV fluid resources.

Committing to these strategies will position Advocate Health to care for our patients and help to prevent the need for additional restrictions on IV fluid use.

In addition to the service line-specific strategies outlined below, the following best practice strategies should be leveraged across the enterprise:

- Minimize TKO/KVO use.
- Evaluate continuous infusions at order entry and at 24 hours for absolute clinical necessity. Discontinue as appropriate.
- Utilize flush syringes or 100mL IVPB for line patency.
- Extend infusion bag hang time to 96 hours for IV fluid replacement.
- Avoid pre-spiking IV fluid bags in all clinical areas prior to assessment of clinical need.
- Optimize oral medication use including electrolytes and hydration.
- Transition high volume IVPB medications to IV push, IM or subcutaneous where clinically appropriate.

Ambulatory Infusion

- Optimize use of 10mL pre-filled saline syringe flush instead of IV flush bags where clinically appropriate.
- Implement antibiotics via IV push instead of an infusion bag where clinically appropriate.

Anesthesia Service Line

- Stop untargeted bulk preparation of IV setups, arterial line setups, and central line setups, to reduce waste. Target urgent/emergent cases or areas of higher turnover.
- Do not arbitrarily swap "floor" fluids for "OR" fluids at the start/end of cases.
- Utilize validated objective measures (e.g., SVV, PPV) to guide proper administration of fluids in patients requiring fluid resuscitation.
- Evaluate stocking of electrolyte oral drinks (e.g., Gatorade, Powerade, Pedialyte, etc.) in applicable areas to encourage oral hydration.

Cancer Service Line

- Utilize ready-to-use zoledronic acid 4 mg bag (SE).
- Utilize oral potassium chloride repletion for $K \geq 3.1$ in the MW & SE electrolyte repletion therapy plans.

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Cardiology Service Line	
General Cardiac Critical Care	• Conserve fluid waste around transfusions. • Utilize oral replacement of electrolytes. For patients that are actively being diuresed, consider standing oral potassium to lessen the needs for protocol replacement. If replacement is needed, save IV piggyback for situations when oral is unable to be used.
Interventional Cardiology, Cath/EP Lab	<u>Outpatient Settings</u> • Ensure patient orally consumes a minimum of 500ml of water prior to procedure and 500ml of water post procedure, prior to discharge. • Encourage oral hydration up until 2 hours prior to anesthesia procedure start time. Encourage oral hydration, up until the time of procedure, for conscious sedation. Oral hydration is in addition to IV fluid protocols to reduce AKI incidence. • Consider on a case-by-case basis - patients with symptomatic Heart Failure, active heart failure management or patients on a fluid restriction.
	<u>Inpatient Settings</u> • Encourage oral hydration up until 2 hours prior to anesthesia procedure start time. Encourage oral hydration, up until the time of procedure, for conscious sedation. Oral hydration is in addition to IV fluid protocols to reduce AKI incidence. • Consider on a case-by-case basis - patients with symptomatic Heart Failure, active heart failure management or patients on a fluid restriction. • For basic EP cases (e.g., Tilts, generator implant changes, ILRs, and DCCVs (DCCV to follow Anesthesia Conservation Guidelines)), Technologists will use NS as needed for ILRs and generator implant changes in procedure basin. For Tilts, 250mL or 500 mL NS (depending on availability) will be utilized for patient infusion. • If mixing in the lab, cefazolin will be mixed with Sterile water instead of NS. It's given IV push.
CV Surgery	• Ensure IV fluid tubing aligns with ICU tubing and pumps upon transfer to minimize IV fluid waste. • High pressure lines (arterial lines and pulmonary artery catheters) use 500mL instead of 1000mL.

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Cardiology Service Line (continued)	
Vascular Surgery	• Encourage early oral intake for patients who can tolerate it. • For those unable to take fluids orally, enteral feeding tubes can be used to provide both nutrition and hydration. • For patients on IV antibiotics, use an earlier transition to PO antibiotics when appropriate. • Implement restrictive fluid strategies based on the patient's hemodynamic status. • Use parameter like central venous pressure (CVP), stroke volume or cardiac output to guide precise fluid administration. • Maintain normothermia: Preventing hypothermia during surgery through active warming devices reduces insensible fluid losses, decreasing the need for postoperative fluid replacement. • Use devices that measure parameters like stroke volume variation (SVV) or pulse pressure variation (PPV) to titrate fluid administration precisely. • Postoperative strategies encouraging early mobilization can improve fluid balance. • Minimize blood loss during procedures via meticulous surgical technique, use of topical hemostatic agents/electrocautery, use of tranexamic acid (when clinically appropriate) and use of blood salvage systems (cell savers).
Children's Service Line	
General	• Upon transfer within a facility, do not automatically pull fluids down to replace with same. • Use intramuscular or nasogastric/oral administration wherever clinically able in appropriate age groups (electrolytes, nutrition, hydration, medications). • Use smallest size manufacturer product that matches patient need per weight or anticipated duration of need. Preference for manufacturer product over facility-compounded/repackaged product to maximize hang time. • Manufactured IV fluids to match 96-hour hang time used in adults. • Evaluate all IV fluid orders when a new bag is being requested/procured to evaluate if IV is still clinically necessary in same size • Consider use of Clinimix nutrition products in older patients as appropriate, to minimize custom formulation compounding.
Critical Care	• Limit total volume of IV bolus • When IVF need to be stopped and restarted, keeping at KVO allows longer hang time until need eliminated • Use 10mL flush syringes for small boluses, line priming, etc. • Fluid restriction focus in critical illness • Potassium chloride IV repletion requiring attending-level approval

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Children's Service Line (continued)	
Emergency Medicine	• Oral/NG rehydration where appropriate • Patients arriving to EDs with TPN, IV medications from partner Advocate health facilities would be accepted for continuation • Partner with ICUs to cease unnecessary switching out fluids upon transfer to floor from ED • Use smallest size manufacturer product that matches patient need per weight or anticipated duration of need. Preference for manufacturer product over facility-compounded/repackaged product to maximize hang time. • Crash carts/push-pull IVF stock have defined expirations – maintain good rotation to use prior to expiration
Neonatology	• Compound/purchase smaller starter TPN bag (250 mL --> 100 mL) • Use smallest size manufacturer product that matches patient need per weight or anticipated duration of need. Preference for manufacturer product over facility-compounded/repackaged product to maximize hang time. • Assess KVO fluids for necessity • Assess feeding advancement schedules; stratify by gestational age with faster advancement at advanced ages

Critical Care / ED Service Line
• Encourage oral rehydration where appropriate. • Utilize a tiered approach to resuscitation for hypotension/shock. • Re-assess fluid responsiveness and additional fluid needs.

Gastroenterology Service Line
• As clinically appropriate use small volume IV fluid bags for shorter cases (e.g., 100mL, 250mL). • Evaluate total fluid requirements for procedures and transition to oral fluids within 24 hours after procedure.

General Surgery Service Line
• As clinically appropriate use small volume IV fluid bags for shorter cases (e.g., 100mL, 250mL). • Evaluate total fluid requirements for surgeries and transition to oral fluids within 24 hours after surgery.

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Infectious Disease / Antimicrobial Stewardship Service Line

- Transition standard, adult doses for cefazolin, ceftriaxone, and daptomycin from IVPB to IV Push
- Encourage antimicrobial stewardship of vancomycin therapy daily for patients with a Pharmacy to Dose Consult

OB / GYN Service Line

Labor	• Encourage oral fluids during labor. • Continue thoughtful use, rather than routine use, of IV fluids during labor. • For management of 3rd stage of labor, oxytocin may be given via IV or IM route.
Triage	• For triage patients with preterm contractions recommend oral, rather than IV, hydration.
Post Partum	• Vaginal & Cesarean Deliveries: Consider capping IV when tolerating oral fluids. Maintain IV access as needed.
GYN Surgery	• Do not spike irrigation bag unless needed during laparoscopic procedures. • Utilize remaining irrigation bag for post-hysterectomy cystoscopies OR use sterile fluid from a bottle to backfill the bladder. • Typically use 1L IV bags for hysteroscopy. Use 3L IV bags at surgeon discretion depending on expected need for fluids during the procedure.

Orthopedics Service Line

- Require physician authorization to spike any new IV fluid bags in the OR.
- Evaluate total fluid requirements for surgeries and transition to oral fluids within 24 hours after surgery.

Radiology Service Line

CT Scan	• For any non-angio exam, a hand flush post contrast injection in accordance with the proper IV maintenance protocols. No power injected saline at all on venous studies.
Diagnostic Radiology	• Nurses will not pre-spike 500mL NS bags for any procedural cases. Nurses will wait until the patient arrives and assess whether IV fluids are required.

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Radiology Service Line (continued)

- For basic cases use a 10mL NS flush instead of 500mL NS bag.
 - For intermediate cases, technologists will transition away from adding 500mL NS to their bowl and an additional 500mL NS spiked to the table. Instead add 250ml to the bowl and 250ml shared with the nurse for sedation.
 - Nurses will not spike 500mL NS bags for sedation cases. They will use a 50ml bag sent by pharmacy.
 - Each exam room will be stocked with 500mL NS for emergent bolus need.
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- For any non-angio exam, a hand flush post contrast injection in accordance with the proper IV maintenance protocol. No power injected saline for venous studies.

Urology Service Line

- Require physician authorization to spike any 3-liter bags.
- For diagnostic or office cystoscopy, 250mL bags should be preferentially used.
- Ureteroscopic and/or ureteral stent/ureteral catheter cases should be done using 1L bags rather than 3L fluid bags.

Pharmacist Authorities

- Pharmacists have the P&T authority to interchange the following medications to IV push (and round where applicable) for adult patients:
 - Phenobarbital $\leq$ 325 mg
 - Levetiracetam $\leq$ 2000 mg
 - PPI continuous infusion to 40 mg BID
 - IV dexamethasone IV 10 mg
 - IV famotidine $\leq$ 40 mg
- Pharmacists have the P&T authority to discontinue any continuous infusion that is NOT running and has NO documentation in the last 24 hours for adult patients.

This document is maintained by the Advocate Health Drug Policy Center. Questions can be emailed to DPC@aah.org.