



Chronic Maintenance In-Center Hemodialysis Standing Orders

1. Target Weight

All new patients will have an initial assessment.

2. Access:

a. Cannulation of surgically created AV Fistulas

In order to initiate cannulation of a new surgically created AV Fistula, the access must meet the following criteria as assessed by a Registered Nurse and with the use of the on-site ultrasound machine:

- At least six weeks from date of creation
- Greater than 1" total palpable length
- 6mm or greater diameter
- 6mm or less depth

b. Cannulation of AV Grafts

In order to initiate cannulation of new AV Grafts, the access must meet the following criteria as assessed by a Registered Nurse and with the use of the on-site ultrasound machine:

- At least two weeks from date of installation
- 6mm or less depth

c. If cannulation criteria are met, proceed with access cannulation.

d. If cannulation criteria are not met, contact surgeon or nephrologist to discuss access plan.

e. For percutaneous AVFs (e.g. Ellipsys or WavelinQ), contact nephrologist for orders for use prior to cannulation

f. Guidelines for Cannulation as follows:

- Aim for experienced staff to cannulate new accesses for the first six runs.
- Refer to nephrologist or surgeon for CVC removal after three consecutive treatments with two needles
- Adjust blood flow rates to needle gauge per table below or as ordered by MD:

Blood Flow rates to Needle Gauge	
200-250ml/min	17 gauge
>250-350ml/min	16 gauge
>350-450ml/min	15 gauge

- AV Fistula week one – use 17g needle for arterial, CVC for venous return OR 17g needles for both A&V if approved by Registered Nurse

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- v. AV Fistula weeks two and three – 16g needles for both A&V if approved by Registered Nurse
- vi. AV Fistula weeks four and ongoing – advance to 15g needles if approved by Registered Nurse
- vii. AV Graft week one – 16g needles for both A&V
- viii. AV Graft weeks two and ongoing – 15g needles

g. **Access Infiltration**

- i. Apply cold pack per policy for infiltrations related to access punctures.
- ii. Refer to access dysfunction algorithm.
- iii. Notify nephrologist if infiltration occurs that prevents dialysis provision that day or if infiltration occurs in new AVF (first 2 weeks of cannulation).

3. **Machine Parameters/Default Settings**

- Bicarbonate: 33 meq/L
- Sodium: 135 meq/L
- Potassium: per MD order
- QD: 600 ml/min or per MD order
- Qb: per MD order. The delta of Qb to QD must be a minimum of 200 ml/min.
- Temperature default: 37 degrees Centigrade

4. **Guidelines for use of 1 K+ baths on prevalent patients is as follows:**

- a. A 1K+ bath can only be prescribed for patients whose pre-dialysis serum potassium level is equal or greater than 6.0mEq/L and requires a physician order.
- b. If pre-dialysis potassium level is >6.0 or < 3.0 or patient is placed on a 1 K bath, both the patient and the registered dietitian should be notified by nursing staff.
- c. The bicarbonate machine setting must be set at 33meq/L (or lower if ordered by MD) for 1K+baths
- d. The serum potassium will be checked every week while the patient is on a 1K+ dialysate bath (ICD10 = E87.5)
- e. When on a 1K+ bath and the serum potassium level falls below 6.0 for two consecutive blood draws, the dialysate will be changed to a 2K+ by the nursing staff.
- f. For patients with a history of GI fluid losses or acute decrease in oral intake during the inter-dialytic period:
 - i. Draw a Chemistry panel (ICD10 = N18.6)
 - ii. Change the dialysate bath to a 2K+ for that treatment
 - iii. Notify the physician

5. **Daily Routine Diet/Fluid Guidelines**

- a. 1500 - 2000 mg sodium and drink to thirst
- b. 3 - 4 grams potassium

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- c. 0.8 - 1.2 grams phosphorus
- d. 1.0 - 1.2 grams/kg protein

6. Laboratory Tests: Routine (Annually = Jan; Semi-annually = Jan, Jul; Quarterly = Jan, Apr, Jul, Oct)

- a. Chemistry panel: monthly (ICD10 = N18.6)
- b. CBC with platelets: monthly (ICD10 = N18.6)
- c. Hepatitis B surface antigen (HBsAg): (ICD10 = N18.6)
 - i. If the patient is HBsAg negative and hepatitis B surface antibody (Anti-HBs) negative (or anti-HBs is <10 mIU/mL): draw HBsAg monthly
 - ii. Draw HBsAg annually on all patients
 - iii. While patients are receiving the Hepatitis vaccination series, draw HbsAg at least 14 days after each vaccine.
- d. Anti-HBs: (ICD10 = N18.6)
 - i. Per vaccination protocol
 - ii. Draw annually on all patients
- e. Total antibody to Hepatitis B core antigen (Anti-HBc): (ICD10 = N18.6) On admission (if not previously obtained)
- f. Hepatitis C Antibody (HCV Ab): (ICD10 = N18.6) On admission (if not previously obtained) and semi-annually. For those new patients with a positive HCV Ab redraw HCV Ab and Hepatitis C RNA by PCR. (Refer to HCV surveillance policy.)
- g. iPTH: Hyperparathyroidism (ICD10 = N25.81) Hypoparathyroidism (ICD10 = E20.8)
 - i. For patients not on IV vitamin D replacement protocol: draw quarterly
 - ii. For patients on Vitamin D replacement protocol: see paricalcitol orders
- h. Aluminum: quarterly for patients on aluminum containing phosphate binders or sucralfate (ICD10 = N18.6 initial and subsequent draws)
- i. Hemoglobin A1C: (ICD10 = Refer to Patients Problem List for diabetic diagnosis) Quarterly on patients with the diagnosis of diabetes mellitus
- j. Magnesium: quarterly (ICD10 = N18.6)
- k. Glucose: quarterly for non-diabetics (ICD10 = R73.09) and monthly for diabetics (ICD10 = Refer to Patients Problem List for diabetic diagnosis)

7. Lab Testing for Dialysis Adequacy: spKt/V, eKT/V, URR: monthly (ICD10 = N18.6)

- a. If dialysis run is unusual on the day of the routine blood draw (see description below) do not obtain post dialysis sample. Reschedule to draw the pre and post dialysis BUN at the next dialysis treatment.

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Unusual dialysis run refers to:

- Substantially shortened dialysis session: A dialysis session of less than 2 hours in duration
 - Extra dialysis run
 - SUF: UF only run, or a sequential UF and dialysis that is not the patient's routine prescription.
- b. If the spKT/V result on the routine monthly lab is less than 1.2, check to make sure the dialysis time is at 4 hours or longer appropriately sized dialyzer is in use, and the Qb is 300 ml/min or higher.

Repeat the spKt/V at the next dialysis. If spKt/V is still less than 1.2 then call the nephrologist for orders.

8. Laboratory Tests PRN

- a. Blood Cultures: (ICD10 = R50.9 fever)
- i. Patients with a CVC and: a temperature greater than 100.0 F degrees (37.8C) or rigors, draw TWO sets of blood cultures from the access/bloodlines at least 5 minutes apart. Notify MD by phone.
 - ii. Patients without a CVC with a temperature greater than 100.0 F (37.8C) Call MD for orders.
- b. Water and Dialysate Cultures/LAL and colony counts: Obtain these from the machine and treatment station when clinical suspicion warrants. (This is in addition to the routine scheduled cultures).
- c. Access Site Cultures: (ICD10 = T82.7.XXA for the initial culture; T82.7XXD if subsequent culture for same infection) Obtain if clinical signs of infection. Notify MD by phone.
- d. COVID-19 PCR testing: Obtain for patients with signs and/or symptoms consistent with COVID-19, when appropriate (ICD10 = Z11.52). Notify MD by fax or phone if PCR positive or if patient reports a positive COVID-19 antigen test.

9. Lab Requests for Patients Who Travel: These may be drawn prior to the scheduled travel, at the discretion and request of the accepting unit.

10. Medications/ Routine

- a. Heparin – Systemic Anticoagulant (Follow In-Center Hemodialysis Standing Orders - Heparin Protocol)
- b. Heparin-Catheter Anticoagulant/Post Dialysis Lumen Instillation
- i. Fill each lumen with 1,000 units/ml heparin post dialysis.
 - ii. Use of 5,000 units/ml heparin requires special physician orders.

11. Medications/PRN

- a. **Adverse Reactions**

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NOTIFY:

- **MD by phone of any dialyzer or drug reaction**
- **Pharmacy of any drug reactions**

TREATMENT:

Benadryl; Epinephrine; Solumedrol may be given for Dialyzer Reaction (ICD10 = T78.40XA) or Drug Reaction (ICD10 = T50.995A) as follows:

- i. Diphenhydramine (Benadryl) 25 mg may be given IV and repeated x 1 prn (if the patient is not hypotensive) for chills, fever, rash, itching, and backache related to any of the above noted reactions.
 - ii. Epinephrine 0.3 mg IM
 - iii. Solumedrol 125 mg IV push over 5-10 minutes
- b. **Topical Anesthetic (ICD10 = R20.0):**

Staff Application

Apply a moderate layer of lidocaine 2.5% / prilocaine 2.5% cream (or other generic equivalent) at the site of needle placement 15-60 minutes (preferably 30 or greater minutes) prior to start of hemodialysis.

Patient Application

Dispense to patient: One 30-gram tube of lidocaine 2.5%/prilocaine 2.5%. Directions for use: Apply a moderate layer (approximately 2.5 grams) of cream at site of needle placement 15-60 minutes (preferably 30 minutes or greater) prior to start of hemodialysis. Cover area with occlusive dressing (plastic wrap).

Refills: As needed. Not to exceed one 30-gram tube per 12 dialysis treatments.

- c. **Tylenol/Acetaminophen** (for Pain (ICD10 = R52) or Fever (ICD10 = R50.9) greater than 100.4 F): Give 325 mg 1-2 tablets every 4 hours prn during dialysis. (Check patient's temperature before administration)
- d. **Nitroglycerin** (for Anginal Chest Pain) (ICD10 = I20.9): Give 0.4 mg (gr 1/150) SL. May Repeat every 5 minutes x 2. **Do not give if systolic BP is less than 100 mmHg.** Notify MD by phone.
- e. **Oxygen (O₂)** (for O₂ saturation <90%) (ICD10 = R09.02 Hypoxemia): If a patient has symptoms of hypotension, dyspnea, or chest pain, assess for a medical emergency. Before administering O₂, obtain pulse oximeter reading. If O₂ saturation is less than 90%, administer O₂ at 2-5 L/min per nasal cannula or 6-10 L/min per face mask. Titrate O₂ for O₂ saturation of ≥90%.
 - For patients on continuous supplemental O₂ at home,

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- administer O₂ per home prescription (ICD10 = Z99.81).
- If patient with new O₂ saturation of <90% that does not resolve with ultrafiltration during dialysis, notify MD by phone prior to the patient leaving the clinic.
- f. **Glucose Paste** (for hypoglycemia/insulin reactions) (ICD10 = E16.2): Obtain glucose monitor result. For symptomatic hypoglycemia (glucose monitor result greater than 50, less than 80) administer ½ to 1 tube (12-24 grams) paste po if patient is alert.
- g. **Dextrose 50% IV** (for severe symptomatic hypoglycemia/insulin reaction, glucose monitor result below 50) (ICD10 = E16.2): administer Dextrose 50% 50 ml i.e. 25 grams IV x 1 dose. Notify MD by phone.
- h. **Normal Saline** (for muscle cramps or hypotension): Normal Saline (0.9%) IV may be given in 100-200 cc boluses up to 1000 cc.
- i. **Normal Saline (to prevent clotting)**: Normal Saline (0.9%) IV may be given in 25-50 cc boluses up to 150 cc.
- j. **Antihypertensives (for Hypertension)**: If systolic BP is greater than 200 or if diastolic BP is greater than 120, Notify MD by phone and DO NOT INITIATE DIALYSIS.
- k. **Seizures**: Initiate Seizure Management protocol and call MD.
- l. **Naloxone**: Please follow assessment for Naloxone use and administration. If the assessment is to administer naloxone, it can be administered as follows (per NKC procedure):
Naloxone 0.4mg IV/IM once, followed by contacting emergency response team, if not already done so. May repeat once after 3 minutes, if appropriate.

12. Vaccinations

- a. Hepatitis B Vaccine (ICD10 = Z23): per protocol
- b. Influenza Vaccine (ICD10 = Z23): Should be administered to all patients during the flu season (Oct-April). Exceptions include- contraindications as stated by the physician, or patient refusal.
- c. Pneumococcal Vaccine (ICD10 = Z23): per Pneumococcal Vaccination protocol
- d. COVID vaccination (ICD10=Z23): per protocol

13. Miscellaneous

- a. Unstable Medical Conditions: If nursing assessment deems the patient unsafe for dialysis, the hemodialysis treatment may be postponed or terminated at the discretion of the RN (with documentation in the EMR) and the MD notified by phone.
- b. Initiate On-Dialysis Protein Supplement (ODPS) Program.
- c. Initiate Bowel Protocol, as needed.

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d. Initiate TB Screening per TB Testing Surveillance for Patients Policy.

14. Emergency dialysis Orders

Provision of dialysis services in an emergency depends on the degree of social isolation of both patients and staff, availability of patient transportation for access to care, and the reserve of caregivers to provide care.

During emergencies (earthquake, fire, flood, power-outage, pandemic, etc.), the following procedure will be implemented:

- In a declared emergency in which the NKC Emergency Operations Center (EOC) is convened, standing orders specific to the emergency at hand will be communicated to facilities, staff and medical staff.
- They are subject to change depending on changes in conditions.
- They may vary from facility to facility.
- Nursing services may exercise discretion and clinical judgment in their application.
- Baseline provision of care should include:
 - i. Dialyzer: any single use dialyzer
 - ii. Dialysate: [Ca⁺⁺] and [K⁺] per patient prescription: if emergency obligates decreased frequency or shortened time call physician for K⁺ orders if normal bath is < or > 2K⁺.
 - iii. Heparinization: 3.0 cc (3000 units) bolus.
 - iv. Time: provision of maximum dialysis time feasible given the nature of the emergency, in conjunction with instructions from the EOC.
 - v. Kayexalate (Hyperkalemia ICD10 = E87.5) provide patient with Kayexalate as needed from disaster supplies (30 gm).

Matthew Rivara, MD

Physician Name (Please Print)

Patient Name _____

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