NORTHWEST Kidney Centers

Adult Home 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, either Care Manager or their designee:
      - 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:
      - At least two weeks from date of installation
      - 6mm or less depth

   c. If cannulation criteria are met, initiate access cannulation
   d. If cannulation criteria 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 initiating cannulation
   f. **Guidelines for Cannulation as follows:**
      i. Aim for experienced staff to cannulate new accesses for the first six runs.
      ii. Refer to nephrologist or surgeon for CVC removal after three consecutive treatments with two needles
      iii. Adjust blood flow rates to needle gauge per table or per MD order.

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

      iv. 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

Patient Name_____**NKC#**_____

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 RN or their designee.
vii. AV Fistula weeks four and ongoing – advance to 15g needles if approved by RN or their designee.
viii. AV Graft week one – 16g needles for both A&V
ix. 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. Guidelines for K+ <4.0:

a. A dietary consult will automatically be made for patients whose serum potassium is less than 4.0.
i. evaluate for K+ supplements, if on a supplement, verify usage. If not, contact primary MD for Rx consideration.

b. The serum potassium will be checked every week while the patient has a K+ of <4.0 (ICD10 = E87.6)

c. When the serum potassium level falls below 4.0 for two consecutive blood draws, the dialysate will be evaluated for a change to 2K+ 45 lactate if currently on a 1K bath.

d. HCO3 level will be checked prior to changing any dialysate.

e. For patients with a history of GI fluid losses, acute decrease in oral intake, or is post hospitalization:
i. Draw a Chemistry panel (ICD10 = N18.6)
ii. Notify the physician

4. Daily Routine Diet/Fluid Guidelines

a. 1500-2000 mg sodium and drink to thirst
b. 3-4 grams potassium
c. 0.8-1.2 gram phosphorus
d. 1.0-1.2 gram/kg protein

5. Laboratory Tests – Routine Draws

Test	ICD10	Frequency
Chemistry panel **	N18.6	° Monthly ° Repeat Ca PRN if result =>10.2
Post-dialysis BUN **	N18.6	° Monthly

Patient Name_____**NKC#**_____

Hemoglobin (Hgb)	N18.6	° Monthly – 3rd week of month as needed ° (Also see Home Dialysis Programs Standing Orders for ESA)
Ferritin, TSAT, Fe, TIBC	E83.10	° Quarterly (Jan-Apr-Jul-Oct) ° (Also see Home Dialysis Programs Standing Orders for Iron)
Hgb A1C	E11.9	° Quarterly (Jan-Apr-July-Oct) on patients who have a diagnosis of diabetes mellitus ° Glucose: quarterly for non-diabetics (ICD10 = R73.09) and monthly for diabetics (ICD10 = Refer to Patients Problem List for diabetic diagnosis)
HBs Ag (Hepatitis B surface antigen)	N18.6	° Monthly if patient is HBsAg negative and Anti-HBs negative (or anti-HBs is <10 mIU/mL) ° While patients are receiving the Hepatitis vaccination series, draw HbsAg at least 14 days after each vaccine. ° Annually (Jan) on all patients
Anti-HBs (Hepatitis B surface antibody)	N18.6	° Annually (Jan) on all patients ° Per vaccination policy.
HCV Ab Hepatitis C Antibody	N18.6	° On admission to home hemodialysis (if not previously obtained) and semi-annually on patients who are HCV Ab negative ° For those new patients with a positive HCV Ab redraw HCV Ab and Hepatitis C RNA by PCR. (Refer to HCV surveillance policy.)
Anti-HBc (total antibody to hepatitis B core antigen)	N18.6	° On admission if not previously obtained
iPTH	N25.81 E20.8	° Quarterly (Jan-Apr-July-Oct) when patient schedules with clinic visit ° Hyperparathyroidism ° Hypoparathyroidism
CBC with Platelets	N18.6	° Monthly
Aluminum	N18.6	° Quarterly (Jan-Apr-July-Oct) for patients on aluminum-based phosphate binders or sucralfate
URR / Kt/V **	N18.6	° Calculated monthly, repeat PRN if standard Kt/V <2.2 for patients dialyzing >3x/week, or spKt/V < 1.2 for 3x/week dialysis.
HCO3	N18.6	° If HCO3 >27 or <20 repeat in monthly clinic ° If result >27 or <20 x3, review HCO3 with MD.

Patient Name_____**NKC#**_____

** Draw on midweek run for conventional therapy and on third run of week for daily therapy.

6. Water Testing Routine Labs

		NxStage Testing Schedule			
Initial Home Survey (Testing Done by Home Staff)	**Initial Home Treatment** (Sampling Done by RN)	**Quarterly Testing** (Sampling Done by Patient)	**Annual Testing** (Sampling Done by staff)	**New or change in H2O source** LAL/CC AAMI sampling by staff	**Patients on well water** Quarterly testing (LAL)/CC sampling by patient AAMI sampling by staff
AAMI (Raw Water)	AAMI (Product Water)	LAL/CC (Dialysate)	AAMI (Raw Water)	AAMI (Raw & Product water) (LAL)/CC (dialysate)	Quarterly LAL/CC AAMI (Product & Raw)
	LAL/CC (Dialysate)		AAMI (Product Water)		
			(LAL)/CC (Dialysate)		

In the event of water main break or flushing, patient will run on bags until approval received from water purveyor and negative LAL/CC/AAMI obtained.

Patient Name_____**NKC#**_____

		TABLO Testing Schedule			
Initial Home Survey (Testing Done by Home Staff)	**Initial Home Treatment** (Sampling Done by Home Staff)	**Quarterly Testing** (Sampling Done by Home Staff)	**Annual Testing** (Sampling Done by Home staff)	**New or change in H2O source** (LAL)/CC sampling by AAMI sampling by home staff	**Patients on well water** Quarterly testing (LAL)/CC AAMI sampling by home staff
AAMI (Raw Water)	AAMI (Product Water)		AAMI (Raw Water and Product Water)	AAMI (Raw & Product Water)	Quarterly AAMI (product & raw)
	LAL/CC (Dialysate)	LAL/CC (Dialysate)	LAL/CC (Dialysate)	LAL/CC (Dialysate)	LAL/CC (Dialysate)
	LAL/CC (Water)	LAL/CC (Water)	LAL/CC (Water)	LAL/CC (Water)	LAL/CC (Water)

7. Laboratory Tests – PRN Draw

a. Blood cultures: (ICD10 = R50.9)

i. For patient **<u>with</u>** a CVC and a temperature greater than 100º F (37.8ºC) or rigors draw TWO sets of blood cultures from the access/bloodlines at least 5 minutes apart. Notify MD by phone

ii. For patient **<u>without</u>** a CVC with a temperature greater than 100ºF (37.8º C), call MD for orders.

iii. Blood Cultures must be drawn in center.

iv. Notify MD.

b. Water and dialysate cultures, BET (LAL), and colony counts: from the machine and treatment station used should be obtained when clinical suspicion warrants. (This is in addition to the routine scheduled cultures).

c. Access site cultures: (ICD10 = T82.7XXA for the initial culture; T82.7XXD for subsequent culture for same infection). Obtain if clinical signs of infection.

i. Must be done in center.

ii. Notify MD.

d. Potassium: (Hyperkalemia:ICD10-E87.5 or Hypokalemia:ICD10-E87.6)

Patient Name_____**NKC#**_____

e. New patient training labs:
End of week #1 & 3 & PRN:
1. K+
2. CO2
3. Pre & post BUN
4. Hgb
5. NKC Profile
6. CBC/Platelets
7. LFT

f. Redraw critical labs PRN

g. 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-antigen test.

8. Back Up in-center orders to be updated annually.

9. Laboratory Tests requests for patients who travel

a. Patients who wish to travel to other facilities while on vacation may have their labs drawn prior to travel, at the discretion and request of the unit to be visited.

10. Medications/Routine

a. Heparin – Anticoagulant

i. Use Pork Heparin 1:1000 u/ml.
ii. Prime and/or hourly Heparin doses per nephrologist order.
iii. If helper/patient reports clotted or streaked dialyzer, Short Daily, increase prime by 500u. If this occurs a second time, schedule patient for a back-up treatment in the Home Training Unit for heparin dose adjustment.
    1. Contact MD for change in heparin dose.
iv. If helper and/or patient notify the Home Training Unit that the patient has had a fall, or is scheduled for same day surgery, dental appointment, or that epistaxis or other active bleeding is present, or if patient is diagnosed with suspected pericarditis reduce the total heparin dose (prime and/or hourly) by ½ or per MD order for that day's treatment.
v. Heparin NxStage Short Daily Dialysis
    1. If patient is transferring from in-center, bolus dose = initial prime + 50% of the total hourly dose.
    2. If dose exceeds 3000u bolus, HH Medical Director to review.
    3. Short daily has no hourly heparin.
vi. Heparin Extended Dialysis
    1. Start with prime of 1000u and 500u/hr.
    2. Adjust per clearance of dialyzer and lines, & bleeding time post dialysis.

Patient Name_____**NKC#**_____

3. Adjust prime first, then hourly.
4. Notify MD of changes.
5. When heparin pump is being used to adjust heparin off time based upon duration of bleeding after the removal of needles post dialysis from exit sites, bleeding should stop within 10 minutes after fistula needle is removed . If it is longer heparin dose may need adjustment.
6. With excessive bleeding despite Heparin decrease, evaluate access for stenosis prior to further dose adjustment.

vii. MD to be notified for platelet drop greater than 50% from previous value and/or absolute platelet count less than 50.

b. Heparin – Central Line Catheter Anticoagulant (ICD10 D68.9)

i. Post Dialysis Lumen Instillation
ii. Fill each lumen with heparin 1:1000 u/ml post dialysis.
iii. Draw up 0.2 ml more than catheter fill volume and instill using positive pressure technique.
iv. If no catheter fill volume is specified, use 1.5 ml/lumen.
v. Use of 1:5,000u/ml Heparin requires special orders.

c. ESA – administer per ESA Standing Orders

d. Iron – administer per Iron Standing Orders

e. Normal Saline – Muscle Cramps or Hypotension

i. Nurse may advise helper to give an additional 500 ml of normal saline in increments of 100 to 200 ml for a total of 1000 ml.
ii. Call MD if patient is requiring >1000 mls.

f. ODPS- Dialysis protein Supplements per dialysis unit policy

11. PRN Medications For Back-Up or Training Runs In-Center

a. Adverse Reactions

NOTIFY:

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

TREATMENT:

Benadryl; Epinephrine; Solumedrol for Dialyzer Reaction (ICD10 T78.40XA) or Drug Reaction (ICD10 - T50.995A)

- **Diphenhydramine (Benadryl**) 25 mg may be given IV and repeated x 1 if necessary (if patient is not hypotensive) for chills, fever, rash, itching and backache as relates to transfusion, dialyzer, or drug reaction.
- **Epinephrine** 0.3 mg **IM**
- **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.

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

c. **Tylenol/Acetaminophen – Pain (ICD10 - R52) & Fever (ICD10 - R50.9)** for fever>100.4° F. Give 325 mg., 1 to 2 tablets every 4 hours PRN during dialysis (after checking patient's temperature)
d. **Nitroglycerin – Anginal Chest Pain (ICD10 - I20.9)**
    i. Nitroglycerin 0.4 mg (gr 1/150) SL. May repeat every 5 minutes x 2.
    ii. Notify MD by phone
    iii. Do not give if systolic BP is <100 mmHg.
e. **Oxygen – Dyspnea, Chest Pain, Hypotension, Arrhythmia (ICD10 - R09.02 Hypoxemia)** Before administering oxygen, check O2 sat. If patient has symptoms such as: dyspnea, chest pain, hypotension, arrhythmia or 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, 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 – Insulin Reactions (ICD10 - E16.2)**
    i. Obtain glucose meter reading.
    ii. For symptomatic hypoglycemia (glucose meter reading below 80), administer approximately ½ to 1 tube (12-24 gm) glucose paste PO.
g. **Dextrose 50% - Insulin Reactions (ICD10 - E16.2)**
    i. For severe symptoms of hypoglycemia or glucose meter reading <50, administer Dextrose 50%, 50 ml (25 gm), IV x 1 dose.
    ii. Notify MD by phone
h. **Normal Saline – Muscle Cramps or Hypotension**
    i. Normal Saline (0.9%) IV may be given in 100 – 200 cc boluses up to 1000 cc's.
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 – Hypertension**
    i. Notify MD by phone if systolic BP greater than 200, or if diastolic BP greater than 120.
    ii. Do not initiate dialysis.

Patient Name_____**NKC#**_____

j. Seizures
Initiate Seizure Management Protocol and call MD.

k. TPA
May only be administered in-center following NKC protocol.

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 or or 4mg intranasal once, followed by contacting emergency response team, if not already done so. May repeat once after 3 minutes, if appropriate.

12. Miscellaneous Medications

a. Influenza Vaccine (ICD10 - Z23)
Influenza vaccine should be administered to all patients annually (when vaccine is available) except those with egg allergy, those for whom the patient's physician has stated it is contraindicated, and those who refuse.

b. Pneumococcal Vaccine (ICD10 - Z23) Per protocol

c. Hepatitis B Vaccine (ICD10 - Z23) Per protocol

d. Covid Vaccine (ICD10 - Z23): Per Protocol

13. Miscellaneous

a. NxStage
- **PureFlow:** Change to PureFlow PRN
- Transition to nocturnal dialysis as indicated.
- During NxStage training patient will dialyze 5x/wk.
- OK for patient to miss one run for 1st home supply delivery.

b. Any other missed training day will be notified to MD.
c. 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.
d. Initiate On-Dialysis Protein Supplement (ODPS) Program.
e. Initiate Bowel Protocol, as needed.
f. Initiate TB Screening per TB Testing Surveillance for Patients policy.

Patient Name_____**NKC#**_____

14. Miscellaneous- For Back-Up or Training Runs In-Center

a. Unstable Medical Conditions

i. If nursing assessment deems patient unsafe for dialysis, hemodialysis may be postponed or terminated at the discretion of the RN.
ii. Notify the nephrologist.
iii. Document in medical record.

b. Emergency Dialysis Orders

i. In the event the patient is unable to dialyze at home due to earthquake, fire, flood, power-outage, pandemic etc. provision of dialysis services 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.
ii. During emergencies (earthquake, fire, flood, power-outage, pandemic, etc.), the following procedure will be implemented:
    1. 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.
        a. They are subject to change depending on changes in conditions.
        b. They may vary from facility to facility.
        c. Nursing services may exercise discretion and clinical judgment in their application.
    2. Baseline provision of care should include:
        a. Dialyzer: any single use dialyzer
        b. 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+.
        c. Heparinization: 3.0 cc (3000 units) bolus.
        d. Time: provision of maximum dialysis time feasible given the nature of the emergency, in conjunction with instructions from the EOC.
        e. Kayexalate (Hyperkalemia ICD10 = E87.5) provide patient with Kayexalate as needed from disaster supplies (30 gm).

c. Direct Start NxStage Orders:

Week 1:
i. 17 Gauge needles
ii. QB 200 ml/min, advance as tolerated to250 ml/min
iii. 30L three days per week, 100% FF

Week 2:
i. 16 Gauge needles
ii. QB 250ml/min, advance as tolerated to 350 ml/min
ii. 40L three days per week, 100% FF

Week 3:
i. 16 Gauge needles
ii. Start standard home Rx, ie 50L 5 days per week, 75% FF

Patient Name_____**NKC#**_____

Week 4:

i. Advance to 15G as tolerated

Medications:

i. Heparin 1000 unit bolus, IV at start of treatment.

Matthew Rivara, MD
Physician Name (Please Print)

Physician signature
(see Initial Orders)

February 3rd, 2025
Date

NORTHWEST Kidney Centers

Adult Home Hemodialysis Patients Standing Orders (Addendum)

Adult Home Hemodialysis Patients Standing Orders – Medications PRN, item 11f. Addendum replaces item 11f with following text:

Glucose Paste/Gel Administration for Hypoglycemia (ICD10 = E16.2). Initial dosing: If patient is alert and symptomatic with a blood glucose between 50 and 79 mg/dL, administer 1 tube/packet (15-24 grams) of glucose paste/gel PO. **Recheck blood glucose in 15 minutes** using the glucometer. Additional dose: If blood glucose result remains less than 80 mg/dL, administer a second dose of glucose paste/gel. Recheck blood glucose in 15 minutes after the second dose of glucose paste/gel. If blood glucose remains less than 80 mg/dL after the second dose and the patient is still symptomatic, call or page the Nephrologist for further instructions.

Matthew Rivara MD
Physician Name (Please Print)

Physician signature

October 6th, 2025
Date

Patient Name: _____ **NKC#** _____

NORTHWEST Kidney Centers

Home Dialysis Programs Standing Orders – Erythropoietin

Erythropoietin (EPO, epoetin alfa, epoetin alfa-epbx, Epogen™) (ICD10 - D63.1)

1. **Goal:** Hgb 10-12 g/dl **Target: Hgb 11 g/dl**

2. **Labs:**
   a. Monthly CBC.
   b. When holding EPO, check Hgb every 2 weeks (twice monthly) until Hgb is <11.5.
   c. If the patient remains on hold for > 4 weeks, return to monthly CBC draws only.
   d. When Hgb <10 g/dl or >11.5 g/dl, check every 2 weeks (twice monthly) and adjust until target range is achieved.

3. **Maximum dose:** EPO dosage is not to exceed 30,000 units/week, or **450 units/kg of dry weight (DW) whichever is lower.**

4. **Administration:**
   a. EPO will be administered subcutaneously (SC) according to the appropriate treatment tier.
   b. Do not exceed 1 cc in volume for any single SC administration.
   c. Weekly doses may be given on the same day.
   d. When a nephrologist makes a dose adjustment off protocol, this is considered a one-time order, unless the nephrologist specifically states that the patient is off protocol. Otherwise resume protocol following the dose change.

5. **Conversion of In-center SC EPO to Home Patient SC EPO:**
   a. Convert patients currently receiving in-center SC EPO to Home Patient SC EPO by determining total weekly in-center EPO dose.
   b. Round the in-center total weekly dose down to closest home treatment tier using the "Average Weekly Dose" on the "Step/Tiers Table" below.

6. **Conversion of Mircera to EPO:**
   a. Convert patients currently receiving Mircera to EPO using a conversion factor of 1 mcg:220 units Mircera:EPO.
   b. Round the dose to the nearest treatment tier.

7. Conversion of IV to SC EPO:

a. Existing patients on IV EPO, change to subcutaneous EPO using the formula: New weekly dose = (current per dialysis dose × frequency) × 0.8 (round to the nearest treatment tier.)

b. IV administration of EPO requires prior approval from the Chief Medical Officer (CMO). **If CMO approves IV administration for the patient, monitoring and dose adjustments will be the responsibility of the attending nephrologist.**

8. New patients and patients naïve to EPO:

a. Weight = Dry Weight.
b. Ensure iron repletion before starting EPO (≥ 25% saturation.)
c. Hgb ≥10.0→ Do not start EPO (label)
d. Hgb <10.0 start 100 units/kg/week (round to the nearest treatment tier.)
e. Patients already on EPO will be treated as existing patients.

9. Dosage Adjustments:

a. Do not make dose adjustments more frequently than every 4 weeks unless the Hgb > 11.5 or < 10 g/dl or patient is new to the Home Program.
b. If Hgb > 11.5 or < 10 g/dl, make dose adjustments twice monthly, corresponding with Hgb checks.
c. If Hgb drops > 2 g/dl, notify MD.
d. Make dose changes based on the "Dose Change" and "Step/Tiers" tables below.
e. Nurse has the discretion to counsel patient to take an existing dose until new dose arrives (if dose is to be increased).
f. When EPO on hold x 6 months, inactivate order and restart as a new patient.

Dose Change Table

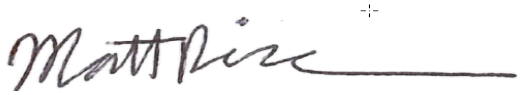
If Current Hgb:	Hgb Change (g/dl)	EPO Dose Change
Hgb ≤ 10	↓ ≥ 1.5	↑ 2 steps
	↑ 0.9 - ↓ 1.4	↑ 1 step
	↑ 1.0 – ↑ 1.4	No Δ
	↑ ≥ 1.5	↓ 1 step
Hgb 10.1 – 10.5	↑0.4 - ↓ ≥ 1.5	↑ 1 step
	↑0.5 – ↑ 1.4	No Δ
	↑ ≥ 1.5	↓ 1 step
Hgb 10.6 – 10.9	↓ ≥ 1	↑ 1 step
	↑ 0.9 - ↓ 0.9	No Δ
	↑ ≥ 1	↓ 1 step

Patient Name_____**NKC#**_____

Dose Change Table (continued)		
If Current Hgb:	**Hgb Change (g/dl)**	**EPO Dose Change**
Hgb 11.0 – 11.5	↓ ≥ 1.5	↑ 1 step
	↓ 0.5 – ↓ 1.4	No Δ
	↑ 1.4 - ↓ 0.4	↓ 1 step
	↑ ≥ 1.5	↓ 2 steps
Hgb 11.6 – 11.9	↑ 0.4 - ↓ ≥ 0.4	↓ 1 step
	↑ 0.5 – ↑ 1.4	↓ 2 steps
	↑ ≥ 1.5	Hold ESA, resume dose when Hgb < 11.5 ↓ 2 steps
Hgb ≥ 12.0		Hold ESA, resume dose when Hgb < 11.5 ↓ 2 steps

Step/Tiers Table		
Step/Tier	Dose	Monthly total
1	2,000 U q 4 weeks	2,000 U
2	2,000 U q 2 weeks	4,000 U
3	2,000 U weekly	8,000 U
4	3,000 U weekly	12,000 U
5	4,000 U weekly	16,000 U
6	10,000 U q 2 weeks	20,000 U
7	6,000 U (3K + 3K) weekly	24,000 U
8	8,000 U (4K + 4K) weekly	32,000 U
9	10,000 U weekly	40,000 U
10	14,000 U (10K + 4K) weekly	56,000 U
11	20,000 U (10K + 10K) weekly	80,000 U
12	30,000 U (10K + 10K +10K) weekly	120,000 U

Matthew Rivara, MD
Physician Name (Please Print)



Physician signature

September 11, 2023
Date

(see Initial Order)

Patient Name_____**NKC#**_____

NORTHWEST Kidney Centers

Methoxy polyethylene glycol-epoetin beta (Mircera®) Protocol

Methoxy polyethylene glycol-epoetin beta (Mircera®) ICD 10 code D63.1
Anemia in chronic kidney disease

Purpose: To provide optimal management of ESRD related anemia in dialysis patients

Hemoglobin Target Goal: 10.0-11.0 g/dL

Methoxy polyethylene glycol-epoetin beta Dosing:

Doses are based on estimated dry weight and rounded to the following steps:

Step	Dose
1	30 mcg every ***four*** weeks
2	50 mcg every ***four*** weeks
3	30 mcg every two weeks
4	50 mcg every two weeks
5	60 mcg every two weeks (30 mcg + 30 mcg)
6	75 mcg every two weeks
7	100 mcg every two weeks
8	150 mcg every two weeks
9	200 mcg every two weeks

Table 1

1. Methoxy polyethylene glycol-epoetin (Mircera®) will be increased and decreased in 1-step or 2-step increments, based on scale above.
2. Mircera® will be administered IV to in-center hemodialysis patients, and SQ to home dialysis patients.
3. Mircera® ceiling is 200 mcg every two weeks (or 3.0 mcg/kg every 2 weeks, whichever is lower). Orders above 200mcg every two weeks require facility medical director or CMO approval.
4. For in-center hemodialysis patients, if pre-dialysis systolic blood pressure is >190 mm Hg, do not administer Mircera®. Notify nephrologist and administer Mircera® dose at next hemodialysis session if systolic blood pressure is <190 mm Hg at that time.

Initiating Mircera® for new patients or ESA naïve patients

For new patients or established patients who have not received an ESA within the last 3 months, initiate as follows:

1. Iron repletion per iron standing orders
2. AND
   a. If Hgb < 10 g/dL, then start Mircera® at 0.6 mcg/kg every 2 weeks, and round down to closest step per Table 1 but no less than 30 mcg every 2 weeks (Step 3).

Patient Name_____ **NKC#** _____

b. If Hgb 10.0-10.4 g/dL, then start Mircera® at 30 mcg every 2 weeks (Step 3).
c. If Hgb >= 10.5 g/dL, then do not start Mircera® until Hgb falls to <10.5 g/dL

Mircera® Dosing Adjustment

1. Titrate Mircera® per the following table for patients who have a Mircera® order and had not been changed in the last 4 weeks:

Mircera® Dosing Adjustment	
Hgb decreased by greater than or equal to 0.5 g/dL since last dose change	
Current Hgb (g/dL)	**Step Dose Change**
Less than 10	2 step dose increase
10.0-10.9	1 step dose increase
11-11.9	No Change
Hgb increased/decreased by less than 0.5 g/dL since last dose change	
Current Hgb (g/dL)	**Step Dose Change**
Less than 9.5	2 step dose increase
9.5-9.9	1 step dose increase
10.0-10.4	If Hgb decreased, do 1 step dose increase. If Hgb increased or stayed the same do NOT change
10.5-11.4	No change
11.5-11.9	1 step dose decrease; if patient is on Step 1, do not HOLD
Hgb increased greater than or equal to 0.5 g/dL since last dose change	
Current Hgb (g/dL)	**Step Dose Change**
Less than 10	1 step dose increase
10-10.4	No Change
10.5-11.9	1 step decrease; if patient is on Step 1, do not HOLD
Current Hgb (g/dL)	**Dose Change**
Greater than or equal to 12 g/dL	Hold Mircera; check Hgb within 2 weeks for patients who are on equal to or more than 50 mcg every 2 weeks
If Hgb is increased or decreased at least 1.0 g/dl since the last Hgb level; recheck Hgb within next 2 dialysis treatments for in-center HD and at next redraw for home patients. Follow the algorithm based on the results of the recheck, e.g., if the value remains the same as the first draw, then follow the algorithm for no change.	

Table 2

2. Do not change Mircera® dose more frequently than every 4 weeks EXCEPT:
   a. If Hgb falls from above 10 g/dL to less than 10 g/dL, increase dose after 2 weeks.
   b. If Hgb is already less than 10 g/dL and drops greater than 0.5 g/dL, increase dose after 2 weeks.
   c. If Hgb >= 12 g/dL, hold Mircera® and check Hgb every week for in- center patients, and at next redraw for home dialysis patients. Resume Mircera® with 1-step decrease as soon as Hgb is < 11.8 g/dL and last dose was administered 2 weeks ago or more. If Hgb remains >= 12 g/dL for more than 2 months, return to regular Hgb testing policy.
3. Post hospitalization: check Hgb at the first clinic visit after hospitalization and pre-hospitalization dose will be administered if patient is due for

Patient Name_____**NKC#** _____

Mircera. When Hgb is back, then titrate Mircera as needed per Table 2.

Conversion from darbepoetin or erythropoietin to Mircera®

1. When a patient with a darbepoetin (Aranesp) or erythropoietin order switches to Mircera®, discontinue darbepoetin (Aranesp) or erythropoietin order.
2. Convert darbepoetin or erythropoietin to appropriate dose of Mircera®, per conversion dose chart below. Convert to Mircera® when the next ESA dose is due.
3. If ESA is on HOLD from another protocol, wait until Hgb is less than 11.8g/dl, then convert ESA as follows: See Table 3 or 4 to convert previous ESA dosing to Mircera® Step, then see Table 1 and decrease 1 Step.

Erythropoietin to Methoxy Polyethylene Glycol Epoetin-beta Conversion Dose Chart		
Epogen Dose (U) per week - total	Mircera® Dose	
	Dose (mcg)	Frequency
< 2000	30	Every 4 weeks
2000 - < 3000	50	Every 4 weeks
3000 - < 5000	30	Every 2 weeks
5000 - < 8000	50	Every 2 weeks
8000 - < 11,000	60	Every 2 weeks
11,000 - < 18,000	75	Every 2 weeks
18,000 - < 27,000	100	Every 2 weeks
27,000 - < 42,000	150	Every 2 weeks
>= 42,000	200	Every 2 weeks

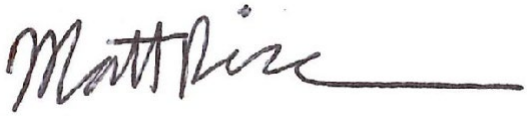
Table 3

Darbepoetin (Aranesp) to Methoxy Polyethylene Glycol Epoetin-beta Conversion Dose Chart		
Darbepoetin Dose (mcg) per week - total	Mircera® Dose	
	Dose (mcg)	Frequency
< 10	50	Every 4 weeks
10 - <20	30	Every 2 weeks
20 - <30	50	Every 2 weeks
30 - < 40	60	Every 2 weeks
40 - < 50	75	Every 2 weeks
50 - < 60	100	Every 2 weeks
60 - < 100	150	Every 2 weeks
>= 100	200	Every 2 weeks

Table 4

Labs: Draw CBC per routine lab orders.

Matthew Rivara, MD
Physician Name (Please Print)



Physician signature

February 3rd, 2025
Date

Patient Name_____ **NKC#** _____

NORTHWEST Kidney Centers

Home Hemodialysis Standing Orders - Iron

Iron Sucrose (Venofer) (ICD10 - D63.1)

1. **Goal:** Iron saturation 30 - 50%; Ferritin 500 - 800 ng/ml.

2. **Labs:** (ICD10 = E83.10)
   a. Draw iron studies (iron saturation and ferritin) monthly until TSAT ≥ 25% then quarterly in January, April, July and October.
   b. Draw iron studies (iron saturation and ferritin) monthly when EPO dose >15,000 units/week.
   c. Iron labs must be drawn at least 7days after last IV iron dose or transfusion.

3. **Administration:** Give Venofer IV push over 2 minutes.

4. **Infection/Antibiotics:** HOLD IV iron if patient has signs of significant infection or is on antibiotics.

5. **Dosing:**
   a. **Test Dose (First Dose Only):**
      i. Administer Venofer test dose of 0.5 cc (100mg/5cc vial) over 3 minutes for the first dose only to assure no allergic reaction. Wait 3 minutes, and then give the remainder.
      ii. Observe the patient in the dialysis unit for 30 minutes following the initial dose of IV iron to watch for possible drug reactions.
   b. Patients transferring from in-center will be converted to Venofer per home dialysis programs iron protocol.
   c. When possible give 2x/week doses on the first and last day of the week.
   d. Based on patient's most recent iron studies give Venofer per tables below.
   e. For high Hgb, refer to EPO S/O.

Patient Name_____ **NKC#**_____

If	And	And		
New to HH Program	**Ferritin**	**Iron Saturation**	**Timing**	**Venofer Dose**
	< 800	< 25%	1st week	Give 200 mg IV push x 2 doses. Each dose should be separated by at least 1 clinic day.
			2nd week	Give 200 mg IV push x 2 doses. Each dose should be separated by at least 1 clinic day.
			3rd week	Give 200 mg IV push Draw follow up iron studies 7 days after last dose and follow S/O.
		25 - 35%	1st week	Give 200 mg IV push x 2 doses. Each dose should be separated by at least 1 clinic day.
			2nd week	Draw follow up iron studies 7 days after last dose and follow S/O.
		36 - 50%	1st week	Give 200 mg IV push
			2nd week	Draw follow up iron studies 7 days after last dose and follow S/O.
		> 50%		Hold Venofer Redraw iron studies with next quarterly draw, and resume protocol.

If	And	And		
Maintenance HH Program	**Ferritin**	**Iron Saturation**		**Venofer Dose**
	< 800	< 25%		Give 200 mg IV push every 2 weeks
		25 - 50%		Give 200 mg IV push every month
		> 50%		Hold Venofer Redraw iron studies with next quarterly draw, and resume protocol.

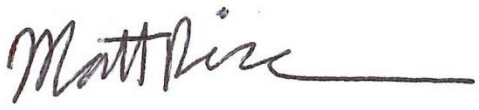
If	And	And		**Venofer Dose**
All HH Program Patients	**Ferritin**	**Iron Saturation**		
	> 800	> 20%		Hold IV Venofer Redraw iron studies with next quarterly draw, and resume protocol.
		≤ 20%		Check with nephrologist

Patient Name_____ **NKC#**_____

6. Hemoglobin:

a. If hemoglobin ≥12, iron saturation >30%, and ferritin >800, hold Venofer.
b. If hemoglobin ≥12, iron saturation ≤30%, and ferritin ≤800, contact MD for direction.
c. If Hemoglobin ≥12, iron saturation ≤30%, and ferritin >800 contact MD for directions.

Matthew Rivara, MD _____
Physician Name (Please Print) RN Name (Please Print)



_____ _____ February 3rd, 2025
Physician signature RN signature Date
(see Initial order)