

Guidelines for Managing Hospitalized Hemodialysis Patients

| Fluids |
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| <ol style="list-style-type: none"> Daily fluid allowance - 1.0 litre/day + urine output. If patient is anuric, intake may be > 500 mL/day as prescribed by physician. IV fluids are to be recorded in patient's daily intake and output. DO NOT keep water at the bedside. Patient may have ice chips occasionally to help quench thirst. NEVER give hemodialysis patients citrus juices - orange and grapefruit, prune or tomato (may cause increased K+ that is harmful for dialysis patients). Cranberry juice is OK. If unsure, check with the Renal Dietitian. Post Fluid Restriction sign above the patient's bed. Weigh patients with acute renal failure daily. |
| Food |
| <ol style="list-style-type: none"> The dietary intake for renal failure patients is a medical prescription. Notify Department of Food Services when a patient is admitted. They should have access to the patient's diet order. Consult the Renal Dietitian regarding specific diet and restrictions. Foods high in potassium are to be avoided. These include oranges, bananas, prunes, and extra milk. Mandarin oranges are fine. To facilitate patient's hemodialysis treatment times, please order early breakfast and lunch trays. Patients should eat prior to dialysis as eating is generally prohibited on hemodialysis unless specifically prescribed; therefore retain the tray on the ward for the patients when they return from hemodialysis. For example: hemodialysis patients receiving treatment in the morning may return to the ward at 1300 hours and will need lunch as they do not receive a tray while in hemodialysis. Tube feeds should be stopped prior to the patient's arrival in the hemodialysis unit as feeding during hemodialysis treatment can increase the risk of hypotension due to splanchnic vasodilation. Please ensure the feeding tube is irrigated and clamped/closed prior to sending the patient. |
| Intravenous |
| <ol style="list-style-type: none"> If using a peripheral IV site, a saline lock should be used. All medications should be diluted or given with minimal amounts of fluid (refer to Pharmacology Guidelines). For Central Venous Catheter (CVC) access follow hospital procedure for dressing change. If dressing becomes soiled, wet or falls off the inpatient, Registered Nurses or Licenced Practical Nurses may change dressing according to the facility's procedure; otherwise the dressing will be changed in dialysis. DO NOT insert IV into fistula arm. If patient has continuous IV fluid/medication infusing (NB to remember patients are on fluid restrictions), ensure that there is adequate amount for the duration of the treatment. |
| Medications |
| <ol style="list-style-type: none"> A patient summary listing current medications will be sent to the ward on admission. Call the hemodialysis unit if one is not received. Refer to Medication Administration Record guidelines for in-hospital and long-term care patients. Some medications such as anti-hypertensives require special considerations related to dialysis; therefore consult with a hemodialysis nurse or Nephrologist. Any medications scheduled to be given at a time the patient is on hemodialysis will be given post hemodialysis unless specifically ordered. <p>Drug Administration Specific to a Renal Patient on hemodialysis:</p> <ul style="list-style-type: none"> Calcium Carbonate and/or sevelamer must be given with meals/snacks unless physician's order specifies otherwise. Replavite is a vitamin taken by hemodialysis patients to replace vitamins lost during hemodialysis. Because it is water-soluble, it must be given after treatment or at bedtime to avoid being dialyzed off. Medications to increase patient's hemoglobin are given in the hemodialysis unit (e.g. EPO & IV Iron). If unsure, contact the hemodialysis unit to determine which medications will be given during hemodialysis. Oral iron supplements must be given between meals or at bedtime. Never give them with phosphate binders. Emla Cream is a topical anesthetic used one hour prior to hemodialysis to freeze the needle puncture sites. Apply a toothpaste-sized strip to areas along the fistula and cover with plastic wrap. Do not apply over skin irritation or open sores. Consult a hemodialysis nurse to indicate location if unsure. Antacid containing magnesium should not be given. Notify HD unit if patient has a Nitro patch. If removed during hemodialysis because the patient experiences a decrease in blood pressure, it should be replaced post hemodialysis. Clarify with nephrologist if the Nitro patch should be removed prior to hemodialysis. IV antibiotics will be given in hemodialysis unit post dialysis if ordered 3x/week. If ordered differently, please check with the nephrologist for the administration schedule and dosage. <ol style="list-style-type: none"> Please ensure all orders for newly prescribed medications or changes to current medications administered during hemodialysis are faxed to the hemodialysis unit as soon as possible. Forward a copy of all discharge medications to the hemodialysis unit when the patient is discharged. |

Fistula/Access

1. **When no other access** is available, a hemodialysis catheter (i.e. CVC) may be used for blood sampling, IV fluid administration, and medication and blood product administration. Prior to accessing CVC, the hemodialysis unit should be notified. At some sites a physician's order is required.
For a newly inserted CVC, a chest x-ray must be done to verify placement of the CVC and an order that confirms proper placement of the catheter must be written by the doctor prior to use.
When a CVC is in situ, but not in use, the dressing must be changed weekly and the lumens instilled with anticoagulant as ordered by nephrologist (usual frequency is twice per week).
2. Fistula Care:
 - Post a sign above the patient's bed (in accordance with facility policy), which indicates the patient's fistula arm.
 - **DO NOT** puncture fistula arm.
 - The hand of the non-fistula arm is the preferred site for IVs.
 - **DO NOT** take blood pressures on the fistula arm.
 - Check patency of fistula daily by feeling the thrill over the anastomosis and along the fistula and by listening for bruit with a stethoscope. Notify a hemodialysis nurse or nephrologist if fistula is not functioning.
 - Remove fistula dressing 4 - 6 hours post dialysis.
 - If the patient's hemodialysis puncture sites bleed, apply pressure for 10 minutes and reapply gauze dressing when bleeding stops.
 - **No constrictive clothing, armbands, or watches** should be worn on the fistula arm.

Bloodwork

1. **DO NOT** draw blood from the fistula arm.
2. Non-urgent bloodwork should be drawn in hemodialysis. Notify hemodialysis staff if bloodwork is required and provide a requisition. Monthly bloodwork (e.g. CBC, Chemistry, INR, PTH) is routinely drawn on chronic hemodialysis patients. This should prevent unnecessary or extra blood draws.
3. The patient is required to fast for triglycerides and cholesterol testing.

Appointments

1. All appointments for hemodialysis patients should be scheduled on non-hemodialysis days. If unable to do so, please consult the hemodialysis unit to coordinate the appointments with the hemodialysis times.

Admission/Discharge

1. Call the hemodialysis unit when a hemodialysis patient is admitted or discharged and determine the hemodialysis schedule for the patient.

Communication

1. **A verbal report is the preferred mode of communication. For units that have standing agreements with the hemodialysis unit, a faxed report may be used if unable to reach the nurse assigned to the patient if the patient had a stable hemodialysis treatment.**
2. The report should include the most recent vital signs, any medications received, recent treatments, recent test results, the patient's condition, and any other pertinent information.
3. The inpatient unit will do all dressing changes except CVC dressings unless the CVC dressing is wet or soiled following procedure 30  Hemodialysis Central Venous Catheter Dressing Change.
4. a) The patient chart, including the *Medication Administration Record*, should accompany the patient to hemodialysis. All medications given in hemodialysis, including prn and routine meds, must be signed for in the inpatient chart. If the patient receives a medication in the hemodialysis unit that is not related to the dialysis process (e.g. analgesic, anti-nausea, etc.) and it is not ordered in the inpatient chart, this information shall be documented in the Integrated Progress Notes and verbally communicated.
b) For Patients with Electronic Patient Records: On arrival to the hemodialysis unit the patient's visit is temporarily located to the hemodialysis unit in the electronic patient record (EPR). The patient's paper chart will accompany the patient to the hemodialysis unit. All renal paper orders are suspended until the hemodialysis RN has reconciled the medications with the nephrologist and the orders are subsequently entered into the EPR. All medications, therefore, must have an order in the EPR and once administered must be documented on the medication worklist in the EPR. If a medication is required and there is no order the hemodialysis RN will contact the nephrologist to enter the order into the EPR.
5. The hemodialysis unit should provide as much warning as possible to the inpatient unit when changes are made to the dialysis schedule. Preferably, at least eight hours notice should be given to ensure the patient is adequately prepared and patient care is minimally disrupted.
6. If the patient's condition has changed since the last hemodialysis treatment or if the patient has become or is unstable, please notify the hemodialysis unit.
7. If the patient is able, the preferred mode of transportation to the hemodialysis unit is a wheelchair.

Note

Infused MRIs – check with nephrologist on call as hemodialysis may be required within 2 hours of receiving this test.

When a patient has any other diagnostic imaging with contrast, they do not necessarily need hemodialysis within 24 hours. Their kidney function is already diminished. This does not apply to patients in Acute Renal Failure. The nephrologist will make this decision.

Medication Administration Times

Guidelines for Hospitalized or Long-Term Care Patients receiving (Chronic) Hemodialysis

Please contact the patient's hemodialysis unit if any clarification is needed on whether a medication is to be administered on the ward or in the hemodialysis unit.

| Medication | Administration Times | Rationale |
|---|---|--|
| Antibiotics/Antifungals/Antivirals (IV and oral) removed by hemodialysis: Acyclovir Imipenem Amoxicillin Levofloxacin* Ampicillin Linezolid Cefazolin Meropenem Cefotaxime Meropenem Cefoxitin Metronidazole Ceftazidime Penicillin Cefuroxime Piperacillin Cephalexin Piperacillin/tazobactam Ciprofloxacin Tobramycin Ertapenem Trimethoprim/sulfamethoxazole Fluconazole Vancomycin Gentamicin | If order is for 3 times per week administration – agent will usually be given in the hemodialysis unit. Contact the hemodialysis unit to confirm, please do not assume that the hemodialysis unit knows about the inpatient order. Antibiotics/antifungals/antivirals removed by hemodialysis: <ul style="list-style-type: none"> • If once daily or q24h: administer at bedtime. • Oral ciprofloxacin and oral levofloxacin should be given at bedtime to avoid interaction with calcium tablets. • If BID: administer at standard morning time and at bedtime • If TID or QID: give at regularly scheduled times with at least 1, preferably 2, doses post hemodialysis | |
| Antihypertensives (IV and oral) removed by hemodialysis: ACE inhibitors Beta blockers Captopril Acebutolol Cilazapril Atenolol Enalapril Metoprolol Lisinopril Nadolol Perindopril Sotalol* (see note below) Ramipril Trandolapril Other Methyldopa Minoxidil <i>* Sotalol contraindicated in dialysis patients due to accumulation and multiple cases of torsades de pointe even at low doses.</i> | In patients with low blood pressure (i.e. systolic blood pressure < 100 mmHg) – consult with a physician to determine if the antihypertensive(s) should be held prior to hemodialysis. Antihypertensives removed by hemodialysis: <ul style="list-style-type: none"> • If ordered once daily – administer at bedtime • Clarify time with HD unit • If BID – administer at standard morning time and give the second dose at bedtime • If TID or QID – give at regularly scheduled times with at least 1 or 2 doses post hemodialysis. | Note: Some patients may have antihypertensives specifically ordered to be given BEFORE hemodialysis if they have increased blood pressures during hemodialysis. Clarifying time of antihypertensive medication administration NB as some medications may cause decreased BP during dialysis and morning dose should be held. |
| ASA (Aspirin, acetylsalicylic acid) | Administer at bedtime to minimize removal by hemodialysis | |
| Emla cream | <ul style="list-style-type: none"> • Apply to fistula 1 hour prior to hemodialysis. • Apply Emla along the fistula where the needles will be inserted. Sites should be 6-8 cm apart and at least 2 cm from previous needle sites. Generously apply and do not rub in (the cream should remain a white blob). Cover with plastic wrap (Saran Wrap) so it will not rub off. • Do not apply over open sores or skin irritation. | |
| Erythropoietin Stimulating Agents (ESAs) Darbepoetin alfa (Aranesp) Erythropoietin alfa (Eprex) | Hemodialysis patients will receive the ESA in the hemodialysis unit. | |
| Gabapentin | Administer at bedtime to minimize removal by hemodialysis | |
| IV iron Iron dextran Iron sucrose (Venofer) Sodium ferric gluconate (Ferrlecit) | Hemodialysis patients will receive their IV iron in the hemodialysis unit. | |
| Nitroglycerin patch | If applied in AM, leave on for hemodialysis unless otherwise specified by patient or prescriber. | Rarely causes significant hypotension, however, the use of nitroglycerin patch during hemodialysis is patient specific. |
| Phenytoin (IV and oral) Free (i.e. active) phenytoin removed by hemodialysis | Administer on the inpatient ward post hemodialysis unless being administered urgently for a seizure. The formula for calculating phenytoin levels in hemodialysis patients is: Corrected phenytoin level (mg/L) = Reported total phenytoin level (mg/L)/[(0.01 x Albumin (g/L)) + 0.1] Therapeutic range = 10–20 mg/L | |
| Phosphate binders Calcium carbonate Calcium citrate Lanthanum carbonate (Fosrenal) Sevelamer (Renagel) | Administer with meals (ideally at the start of the meal) unless otherwise specified. Patients on oral ciprofloxacin, oral levofloxacin, or oral levothyroxine should have their doses given 2 hours before or 4 hours after any phosphate binder. Patients on oral phenytoin and a calcium containing binder should have their doses given 2 hours before or 4 hours after the calcium. | |
| Replavite | Administer at bedtime to minimize removal by dialysis | |
| Vitamin D Calcitriol Ergocalciferol | IV calcitriol will be given in the hemodialysis unit. Hemodialysis patients on oral calcitriol or ergocalciferol should be given it at bedtime. | Dose oral vitamin D at bedtime to decrease risk of hypercalcemia and hyperphosphatemia. |