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TITLE
CLIN_216 HEMODIALYSIS/PLASMAPHERESIS PROCEDURE AND CATHETER MANAGEMENT FOR THE ADULT AND PEDIATRIC PATIENT

APPLICABILITY
Edward Hospital

POLICY STATEMENT(S)
To set forth the teamwork between Edward staff and the Apheresis/Dialysis provider in providing care to this group of patients.

DEFINITION(S)
**Therapeutic Apheresis:** A procedure in which blood is drawn from a patient and separated into its components, some of which are retained, such as plasma, platelets, RBCs, WBCs depending on disease indications and the remainder returned by transfusion to the patient.

**Therapeutic Cytapheresis:** Apheresis procedure that involves the removal of specific cells from the blood, for the purpose of either collection or reduction due to excessive proliferation in the blood.

**Hemodialysis:** The removal of fluid and waste products from the blood and the correction of electrolyte imbalances through the process of diffusion across a semi-permeable membrane (dialyzer or peritoneal cavity).

**Therapeutic Leukapheresis:** White blood cell depletion.

**Therapeutic Plasmapheresis (TPE):** Apheresis procedure involves separation of blood and removal of patient’s plasma, followed by replacement with 5% albumin, Fresh Frozen Plasma or Plasma frozen-24, depending on the disease indications.

1. **Fresh Frozen Plasma (FFP)/cryo-poor plasma replacement fluids.** Indications are: TTP, HUS, post transfusion purpura.
2. **5% albumin/0.9% NaCl replacement fluids.** Indications are Guillain-Barré Syndrome, Myasthenia Gravis, Systemic Lupus Erythematosus, Multiple Myeloma with Hyperviscosity Syndrome, Post-transplant Rejection, Good Pasteure’s Syndrome, Multiple Sclerosis, Waldenström’s Macroglobulinemia, Wagener’s Granulomatosis, Chronic Inflammatory Demyelinating Polyneuropathy, many other autoimmune diseases.

**Thrombocytapheresis:** Platelet depletion.

**Tunneled Central Venous Catheters:** A catheter that is implanted into the subclavian, internal jugular or femoral veins and terminates in the superior vena cava. These catheters are intended for long-term use. Examples: Groshong and Hickman catheters.

PROCEDURE
PRE-PROCEDURE - EDWARD NURSING STAFF:
1. Obtain Specific Order:
   a. Hemodialysis order is obtained from nephrologist.
   b. Apheresis order is obtained from nephrologist, neurologist, pediatric intensivist, oncologist or hematologist.
2. Arrange/verify treatment contacting
   a. 1-800-269-8307 for Hemodialysis
   b. 1-866-683-7623 for Apheresis
3. Specify if treatment is stat or prescheduled. Notify provider of schedule conflicts such as other procedures, discharge time, etc.
   a. Dialysis: For stat requests the dialysis provider calls the Edward unit within 30 minutes. The provider has two hours to arrive for stat treatments.
   b. Apheresis: The Apheresis team has four hours from the original response call to arrive for emergency procedures. For pre-scheduled Apheresis treatments, specify the time of the order for outpatient or inpatient schedule.
4. Assess that patient has functional access for procedure. If no access is available, notify provider and MD regarding status so procedure may be rescheduled.
5. Communicate most recent lab results, weight, and specific procedure orders to provider.
6. Hold medications only if there is a specific order to hold for dialysis.
7. Notify Blood Bank and Pharmacy with procedure time to allow for preparation of replacement fluids such as Fresh Frozen Plasma, Packed Red Blood Cells and Albumin as ordered.
8. Assist provider with education of procedure to patient.

During Procedure
1. The Apheresis/Dialysis provider monitors vital signs, machine functioning, patient response to procedure, blood transfusion reaction symptoms and obtain blood samples if necessary.
2. The Edward RN is responsible for ongoing assessment, evaluating monitoring systems (i.e. arterial pressure line, central pressure monitor, electrocardiography, etc) preparation of lab tubes for blood draws and notification of physician with a change in patient condition.
3. Medication and Blood Products
   a. Apheresis: The Apheresis provider is responsible for administration of medication and blood products for the prescribed exchange only. The Apheresis provider completes the Blood Transfusion Record
   b. Hemodialysis: The Edward RN is responsible for administration and documentation of medication and blood products. The provider shows the Edward RN where to place the medication and blood product in the blood circuit.
4. It is recommended that the patient not eat a meal while on dialysis due to the risk of aspiration, hypotension and for infection control reasons. If necessary a snack may be provided for diabetic patients prior to dialysis treatment.

Post Procedure
1. The provider performs catheter care with dressing change as per Edward protocol, draws post procedure lab work, communicates to Edward RN report of procedure including but not limited to patient tolerance to treatment, amount and type of replacement fluid given and Net Volume at the end of the procedure.
2. The Edward RN prepares lab tubes for blood draws, notifies physician of lab results, signs and files the dialysis flow sheet in the patient chart and documents intake and output pertinent to treatment including the amount of fluid removed in the electronic medical record.
Catheter Management

1. General Principals
   a. Refer to Policy CLIN_082: Adult Central Line Catheter Insertion and Management or CLIN_202 Pediatric/Neonatal Central Line Care and Maintenance
   b. The double lumen Hemodialysis/Apheresis catheter is used strictly for hemodialysis. No Lab draws or administration of IV solutions is done except in an emergency or with a nephrologist’s order. Exception: With a Triple Lumen Hemodialysis Catheter, the 3rd port or IV pigtail can be used for the administration of IV fluids, medication, or blood draws.

2. Site Care/Dressing Change:
   a. Performed by the Edward RN or Dialysis Provider after each treatment
   b. Clamp the catheter and cap between treatments.
   c. Change the catheter cap after each dialysis treatment.

3. Flushing/Heparinization:
   a. ADULT:
      1) Maintain each lumen with heparin 1000units/ml undiluted corresponding to the amount designated on the arterial and venous extensions.
      2) If the catheter extension is not labeled, use 1.5ml of heparin 1000units/ml undiluted.
   b. PEDIATRIC
      1) Obtain physician order to include heparin concentration, volume and frequency of flushing
   c. All heparin must be removed from the lumens prior to use. (Follow procedure for blood draw)

4. Blood Draw
   a. Obtain Nephrologist/Hematologist order to access dialysis catheter.
   b. Access double lumen catheter via BLUE lumen only
      Access triple lumen catheter via BROWN (pigtail) or BLUE lumen
   c. Procedure:
      1) Perform hand hygiene
      2) Open all packages maintaining sterility
      3) Use sterile technique
      4) Don gloves
      5) With catheter clamp closed, remove catheter cap device and cleanse end of catheter with alcohol and allow to dry
      6) Attach 10ml luer lock syringe.
      7) Unclamp lumen and aspirate 10ml’s of blood and dwelling heparin.
      8) Clamp lumen and discard aspirate
      9) Attach new syringe
      10) Open clamp, withdraw appropriate amount of blood; attach needleless blood collection adapter and transfer to vacutainers. *Be sure to clamp between each syringe change.
      11) Clamp tubing, attach syringe with 10 ml normal saline.
      12) Open clamp, flush with normal saline, clamp
      13) Detach syringe with normal saline, attach syringe with heparin solution of 1500 units unless specified on catheter.
      14) Pediatrics – Obtain physician order for heparin flush and concentration
      15) Open clamp, flush, clamp during last 0.5 ml of heparin flush
16) Detach syringe
17) Attach new catheter cap device

5. IV Fluid Administration
   a. Obtain Nephrologist/Hematologist order.
   b. If an order is received for intermittent drug administration via the hemodialysis catheter, a
      flush bag must be utilized and maintained at a rate of at least 20ml/hour unless otherwise ordered.
   c. Access Double Lumen catheter via BLUE lumen only
   d. Access Triple Lumen catheter via BROWN (pigtail) or BLUE lumen
   e. Procedure:
      1) Perform hand hygiene
      2) With catheter clamp closed, remove catheter cap device and cleanse end of catheter with alcohol and allow to dry.
      3) Attach sterile 10ml luer lock syringe to catheter
      4) Unclamp catheter and aspirate 10ml of blood. This will remove the previous 1,500 units of heparin and check for catheter patency
      5) Clamp catheter and discard aspirated blood
      6) Attach sterile 10ml syringe and flush with 10ml saline. Clamp catheter and remove syringe.
      7) Attach needleless connector. Disinfect needleless connector prior to each access.
      8) Attach IV tubing.
      9) Unclamp catheter.
     10) Start IV administration
     11) Tape connection
     12) If the IV flow is sluggish or there is mild resistance, examine the tubing and the external catheter for kinks or tension. DO NOT IRRIGATE THE CATHETER – you may only pull back to check for blood return and patency.

6. Managing Triple Lumen Hemodialysis Catheter 3rd Port
   a. IV Fluid Infusion: Follow procedure for Continuous IV infusion above.
   b. Heparinization - Adult
      1) Unused: Flush port BID with 3-5ml saline followed by 2ml of heparin 100 units/ml
      2) Post IV infusion/blood draw: Flush with 3-5ml saline followed by 2ml heparin100 units/ml
         Note: Heparin is a different dosage than for heparinization of main ports.
   c. Heparinization – Pediatric
      1) Obtain physician order to include heparin concentration, volume and frequency of flushing

7. Discontinuing Dialysis/Apheresis Catheters
   a. Temporary catheters can be discontinued by the Edward RN on the unit with a Physician order.
   b. Permanent or tunneled dialysis catheters are removed by a physician in interventional radiology.

CROSS REFERENCE(S)
CLIN_082  Adult Central Line Catheter Management (Including: Nontunneled, Tunneled, and Peripherally Inserted Central Catheters)
**Policy No:**  CLIN_216  
**Previous Policy No.:**  CLIN_070 and CLIN_194  
**Effective Date:**  01/14/2010  
**Most Recent Revision Date:**  06/04/2012  
**Initiation:**  
**Approval:**  Policy Committee:  01/14/2010; 02/10/2011; 08/11/2011; 02/09/2012; 06/04/2012