Children's Health Ireland at Temple Street

Ward: _____ Date: _____

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Therapeutic Plasma Exchange (TPE) Nursing Care Plan

Problem: ----------**requires Therapeutic Plasma Exchange due to**----------	**S/N Sig:**_____ **NMBI**_____	**Date:**_____ **Planned By:**_____ **Grade:**_____	**Problem no:**

Goal:

a: To ensure safe removal of Plasma and replacement with appropriate fluids. b: Provide effective TPE while minimizing any undesired side effects.
c: To promote holistic care of the child and family while receiving Therapeutic plasma Exchange.

Nursing care:	**Self / Family care**	**Date / Signature / Grade / NMBI for any changes to care.**
Central Venous Access 1. The establishment of central venous access with optimum blood flow is critical to a successful and effective Plasma Exchange Therapy (IPE and Marques2018). 2. Prepare ----------and family for insertion of Central venous access device (CVAD). 3. Record line size ------ Fr ----------cm inserted in ---------- -vein and date of insertion ---------- 4. Ensure the vascular access is achieved and maintained without complications, refer to CVAD guidelines (**PP-CLIN-NUR-122**). For Permcaths refer to Hemodialysis CVAD care bundle. 5. Observe for complications related to central venous access such as infection, hematoma, thrombus, air embolism, dislodgement or poor blood flow through the circuit. 6. Adhere to hand washing and use of Aseptic Non Touch Technique (ANTT) prior to any contact with CVAD or access site (**PP-CLIN-NUR-122**) Clean and redress line as specified in ----------CVAD dressing plan. **Extracorporeal Volume (ECV)** 1. Calculate ---------- total blood volume (TBV) 80mls/ Kg. 2. The extracorporeal volume is calculated as 8-10% of TBV it must not exceed 10%. 3. One Total Plasma Exchange (TPE) is 40mls per Kg (Nickson 2020) First session 1 exchange recommended 40mls/Kg then 1.5 exchanges 60mls/Kg, Max 2 exchanges 80mls/Kg. TPE policy (**PP-CLIN-NEPH-1**). 4. TPE prescription and programme on Aquarius Machine must be checked by 2 nurses. 5. Ensure correct size lines and filter, ensure filter is a plasma exchange MPS filter, record filter batch number on TPE Nursing Record Sheet. Filter surface area should be equal or less than child's body surface are (Pediatric Nephrology 2008). 6. Ensure blood or albumin prime if patient ≤ 10Kg or if patients Extracorporeal Volume (ECV) exceeds priming volume	----------family will state concerns and ask questions regarding TPE.	

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Nursing Care Plan for ……. continued

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Replacement fluids 1. To maintain oncotic pressure plasma removed must be replaced ml /ml. Replacement fluids should be 60-80% colloid and 20-40% crystalloid. Administer colloid as prescribed near the end of session to avoid hypovolemia (Winters 2012). **Pre- Treatment** **2.** Administer Alphacalcidol one hour prior to TPE as ordered on drug Kardex, for recommended dose refer to TPE guideline (**PP-CLIN-NEPH-1**). **3.** Withhold routine medications which are protein bound until after procedure as these drugs may be removed during TPE session (Winters 2012). **4.** Ensure the following laboratory values are monitored prior to first session – Urea and Electrolytes, Coagulation, Full Blood Count, if indicated immunoglobulin's (IgG ,IgA ,IgM)and for HUS patient lactate Dehydrogenase. Check with team if any additional bloods or markers should be considered. .For additional session's pre and post bloods should be discussed. Blood gas taken on connection and then half hourly during session. **5.** Ensure two appropriate health care providers independently verify correctness of blood product administered during TPE, refer to blood administration protocol (**PP-CLIN—HV-046**). Connect blood filter when using Octoplas as replacement fluid. **6.** Unit of red cells available during initial acute sessions. **7.** Only commence treatment when patient is safely established on circuit and tolerating Blood Flow Rate. **8.** First session is always at least 3 hours and limited to one exchange only (Eyre et al 2018) **9.** Consider antihistamine prior to Octoplas. **Treatment** **1.** Complete ----------s assessment and document on PEWS chart. Perform continuous ECG monitoring and oxygen saturation during TPE session. Record patient observations and Aquarius machine values on TPE Nursing Record Sheet. Monitor ----------s temperature and ensure bear hugger available. **2.** Closely monitor Trans Membrane Pressure (TMP).The TMP should not exceed 50mmHg to protect the integrity of the line and reduce the risk of clot formation. (Peppe and Kingdom 2014). **3.** Ensure balance key is turned off when handling replacement fluids to avoid wrongful alteration in plasma volume achieved. **4.** Refer to TPE guidelines (PP-CLIN-NEPH-1) for management of blood leak alarm.	---------family will cooperate and participate in care and distraction activities. ----------family will cooperate with TPE and in early identification of unexpected outcomes related to treatment.	

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5. In the event of an air detector alarm, the blood level dropping in return chamber or air evident in return line - Connect syringe to bubble trap then press air detector clamp key to open the return line clamp, remove air from return chamber with a syringe on bubble trap. If level in chamber is correct and no air in tubing press the clamp key to close the return line clamp. Resume treatment by pressing the blood pump key. 6. 0.9% Sodium chloride should be prescribed and available in case rescue bolus required. 7. Monitor and maintain ----------s Activating Clotting Time (ACT) as per TPE guideline (**PP-CLIN-NEPH-1**). Ensure Heparin locks and infusion prescribed on Kardex .Ensure heparin lock removed prior to commencing treatment, and once line locked they should be clearly labeled. Administer heparin infusion following Standard Concentration Formula. 8. Provide support to ----------and family during TPE and arrange appropriate distraction activities in conjunction with the play therapist. **Complications of Therapeutic Plasma Exchange** 1. **Hypervolemia/hypervolemia –** Monitor for signs of fluid imbalance – Tachycardia, Hypo/Hypertension, reduced /increased pulse volume, reduced /increased urine output, Odema. 2. **Electrolyte imbalance -** Blood gas on connection and then every 30mins during session. Monitor for signs and symptoms of electrolyte imbalance –abdominal pain or cramps, nausea, vomiting, perioral tingling, numbness or feeling of pins and needles in the fingers. 3. **Hypocalcaemia –** Monitor ionized calcium and if < 1 treat with Calcium Gluconate infusion as prescribed as per CHI Pediatric drug formulary. 4. **Transfusion reaction –** Monitor for signs and symptoms – fever, chills, hives, urticarial, swelling or dyspnea. 5. **Coagulation –** Observe for active bleeding or severe coagulopathy. Consider lower ACT parameters or heparin free plasma exchange. In event of over administration of heparin, refer to CHI Pediatric formulary for administration of Protamine Sulphate. 6. **Air embolism –** This is a rare complication and prompt action needed , clamp venous line, place patient on left lateral , administer 100% o2 via non rebreather and give cardiopulmonary support as necessary. Urgent Medical review, Code blue or Urgent Pews call on 2222 depending on clinical condition.		

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End of Treatment **1.** Disconnect patient using Aseptic Non Touch Technique (ANTT) outlined in CVAD guidelines (**PP-CLIN-NUR-122**). **2.** Use 0.9% NCL for wash back; discuss with Nephrology/Intensive Care how much wash back to be administered. **3.** Observe reinfusion volume and observe lines for air and blood clots during the disconnection process. **4.** Post treatment carry out full clinical assessment on----------and record observations in PEWS chart. **5.** Ensure an individualized holistic approach to the child and family's care is maintained.		

References

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