The Ottawa Hospital | L'Hôpital d'Ottawa

NEPHROLOGY PROGRAM
DEPARTMENT POLICIES AND PROCEDURES

Hemodialysis - Section 03 - Patient Assessment & Management - Neph 3-10 Management of a Suspected Pyrogenic Reaction

No.: 00733 (TOH Standardized Policy Number)

ISSUED BY:
Hemodialysis Clinical Practice Committee

DATE OF APPROVAL:
N\A

APPROVED BY:
Nephrology Steering Committee

LAST REVIEW/REVISION DATE:
2013/02

CATEGORY:
Patient Assessment and Management

IMPLEMENTATION DATE:
2003/02

PURPOSE:

- To recognize a suspected pyrogenic reaction during a hemodialysis treatment and respond appropriately by initiating the tests for pyrogens or endotoxins

BACKGROUND STATEMENTS:

- Pyrogenic reactions usually occur during the first 30-60 minutes of a hemodialysis treatment and have a sudden and rapid onset
- The following signs and symptoms are characteristic of a pyrogenic reaction:
  - Rapid temperature elevation >37.8 in a patient who was afebrile pre-dialysis
  - Uncontrollable chills and rigors
  - Headache, nausea, and/or vomiting
  - Drop in blood pressure
  - Circulatory collapse, if severe

Note: Bacteremia (access related and non- access related) can cause a similar clinical presentation as hemodialysis- related pyrogenic reactions. Bacteremia should be considered as a reasonable possibility in the differential diagnosis when this constellation of signs/symptoms occurs in a single hemodialysis patient. Pyrogenic reactions in Hemodialysis could be due to:

  - Contaminated water supply
  - Contaminated dialysate fluid
  - Contaminated supplies

- When more than one patient dialyzing on a multiple station water treatment system exhibits one or more of the symptoms mentioned above simultaneously, this is suggestive of a contaminated water supply to the dialysis machines
- When only one patient who is being dialyzed on a machine hooked to a multiple station water treatment system develops a pyrogenic reaction, this is indicative of contaminated dialysate fluid. The contaminated dialysate fluid may be due to contaminated bicarbonate concentrate or bacteria growing within the machine
- When a patient dialyzing on a machine hooked to an individual water treatment system (i.e. off unit machine)exhibits one or more of the symptoms, the pyrogenic reaction may be a result of a contaminated water treatment system/ contaminated dialysate fluid or supplies

SUPPLIES:

- Blood culture supplies

DEFINITION(S): N/A

ALERTS: N/A

PROCEDURE:

Section A: Suspected contaminated water supply being delivered to multiple patients

1. Dialysis should be stopped immediately for all affected patients dialyzing on machines using this water treatment system. Do Not return the patients blood. Discard the extracorporeal circuit into a yellow pail
2. Do not turn the machine off. Do not disinfect the machine until the dialysis technicians have obtained water samples
3. The RN will:
   - Contact the: the Physician / delegate, the Clinical Manager and the Technical Manager- after hours contact the on-call Dialysis Technologist
   - Draw blood culture specimens
4. The Dialysis Technologist will as per Neph 3-01 (#00726) and Neph 3-02 (#00727):
   - Obtain samples for bacteria count and Endotoxin level tests from the:
     - Water supply
     - The dialysate from the machines where the patients developed symptoms
     - The bicarbonate concentrate from the machines where the patients developed symptoms
   - If results are positive, the Dialysis Technologist will disinfect the water treatment system as per program standards
   - Obtain water samples from the water loop to verify the bacteria count and the endotoxin level after disinfection

5. The Manager or delegate and Nephrologist will triage patients who need immediate dialysis and arrange for their treatment at another hemodialysis unit.
6. Resumed use of the water system will be decided by the Nephrologist in consultation with the Technical Manager, Infection Control when the post disinfection culture results are known

Section B: Suspected contaminated dialysate fluid

1. Dialysis should be stopped immediately on affected patient(s). **Do Not** return the patients blood. Discard the extracorporeal circuit into a yellow pail
2. Do not turn the machine off. Do not disinfect the machine until the technicians have obtained water samples. Save the concentrate jugs
3. The RN will
   - Contact the: the Physician / delegate, the Clinical Manager and the Technical Manager- after hours contact the on-call Dialysis Technician
   - Draw blood culture specimens
   - Resume treatment as directed by the Nephrologist on a new dialysis machine with fresh jugs of concentrate and wands
4. The Dialysis Technologist will as per Neph 3-01 (#00726) and Neph 3-02 (#00727):
   - Obtain samples for bacteria count and Endotoxin level tests from the:
     - Water supply
     - The dialysate from the machines where the patients developed symptoms
     - The bicarbonate concentrate from the machines where the patients developed symptoms
   - Remove the machine from circulation and disinfect the dialysis machines as per program standards
   - Obtain water samples from the Dialysis machine to verify the bacteria count and the endotoxin level after disinfection

Note: The machine goes back to service according to the culture results. Please notify Technical Manager and Infection Control of the results

Section C: Suspected pyrogenic reaction when using an individual water treatment system

1. Dialysis should be stopped immediately for this patient. **Do Not** return the patients blood. Discard the extracorporeal circuit into a yellow pail
2. Do not turn the machine off. Do not disinfect the machine until the technicians have obtained water samples. Save the concentrate jugs
3. The RN will
   - Contact the : the Physician / delegate, the Clinical Manager and the Technical Manager- after hours contact the on-call Dialysis Technician
   - Draw blood culture specimens
   - Resume treatment as directed by the Nephrologist on a new dialysis machine (with new RO) and with fresh concentrate and fresh wands

4. The Dialysis Technologist will as per Neph 3-01 (#00726) and Neph 3-02 (#00727):
   - Obtain samples for bacteria count and Endotoxin level tests from the:
     - Water treatment system
     - The dialysate from the machine
     - The bicarbonate concentrate from the machine
   - Remove the machine from circulation and disinfect the dialysis machine and portable water treatment system as per program standards
   - Obtain water samples from the water treatment system and Dialysis machine to verify the bacteria count and the endotoxin level after disinfection

Note: The machine will go back into service according to the culture results. Notify Technical Manager and Infection Control of the results

DOCUMENTATION:

Document patient symptoms, interventions and patient responses to interventions in the Health Record (NephroCare)

Complete a Patient Incident Report using TOH PSLS

RELATED POLICIES / LEGISLATION:

1. Nephrology Policies and Procedures - Hemodialysis - Section 03 - Patient Assessment and Management - Neph 3-01 (#00726) Pre Dialysis, Intradialysis and Post Dialysis Assessment Standards

2. Nephrology Policies and Procedures - Hemodialysis - Section 03 - Patient Assessment and Management - Neph 3-02 (# 00727) Vascular Access Recirculation Testing Using Blood Sampling Technique

REFERENCES:

1. CDC Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients (Subsection Sterilization, Disinfection and Cleaning) April 27, 2001

2. CAN/CSA-ISO 11663-11 Quality of dialysis fluid for Hemodialysis and related therapies

3. CAN/CSA-ISO 13959-11 Water for Hemodialysis and related therapies

4. CAN/CSA-ISO 13958-11 Concentrates for haemodialysis and related therapies

5. AAMI Standards RD 52:2004

COMMENTS / SIGNIFICANT REVISIONS: N/A