

 BC Renal Agency	Title: Heparin Adjustment Protocol	
Clinical Practice Standards and Procedures	Section: Number:	Origin Date: May 15, 2008 Revised Date:

1.0 PRACTICE STANDARD

Skill Level: Specialized

Registered Nurses who have completed the required hemodialysis specialty education and who provide nursing care in a British Columbia In-Centre and/or Community Renal Program perform this procedure.

Titrating Heparin doses during hemodialysis is within the Scope of Practice of Registered Nurses under the Health Professions (Registered Nurses and Nurse Practitioners) Act, 2006.

Hemodialysis Nurses will adjust the heparin dose per protocol based on clear evidence of significant and consistent clotting of the hemodialysis extracorporeal system (defined below).

Need to Know:

- Appropriate heparinization during dialysis is important as it allows blood to flow freely in the extracorporeal circuit.
- The initial heparin prescription is patient specific and must be ordered by the Nephrologist.
- The goal of appropriate anticoagulation is to prevent dialyzer clotting, to maximize and maintain membrane efficiency, and to facilitate homeostasis post dialysis.
- During a dialysis treatment, when blood comes in contact with the tubing or membrane, clotting of the blood may occur which may lead to decreased membrane efficiency or occlusion of the circuit.
- There are several anticoagulant options available and of these, heparin 1,000 units/mL is the most common.
- Heparin prevents clotting by bonding to circulating antithrombin III, resulting in a rapid inactivation of clotting factors II, IX, XI, and XII.
- Once heparin enters the blood system, it takes about 3-5 minutes to initiate the anticoagulant process.
- In healthy adults, it is estimated that heparin half-life is from 30 – 120 minutes.
- The heparin half-life may be slightly prolonged in patients with severe renal impairment.
- Caution should be taken for the continued presence of heparin which may induce bleeding events such as:
 - intracranial, GI or subdural bleeding
 - retinal bleeding in patients with diabetes mellitus
 - bruising and hematoma

- bleeding around fistula needles during dialysis
 - exaggerated or prolonged bleeding post-dialysis from needle punctures
 - external bleeding from needle sites once patient is home
- Special circumstances may require consultation with the Nephrologist before dose adjustments are made. These include:
 - Pericarditis
 - Patients admitted to hospital
 - Recent major surgery within 7 days
 - Minor surgery immediately post hemodialysis
 - Coagulopathies
 - Thrombocytopenia
 - Coumadin and INR >3.0
 - Methanol or drug overdose
 - Some liver diseases
 - Menstruating women
 - Situations in which the dose of heparin should be reassessed include:
 - Platelet count < 50: dose may need to be reduced.
 - Surgery within the last 2 days: heparin free for the subsequent 2 treatments after the surgery. Hold and restart dates to be determined by MD based on type and extent of surgery.
 - Known to have active bleeding from the retina (i.e. due to diabetes or trauma) or has had eye surgery within the last 10 days. It is recommended that heparin be held for 3 runs post eye surgery for retinal bleeding. For potential of retinal bleeding, consult MD.
 - Menstruating women.
 - Initiating cannulation using the one needle – one catheter technique, reduce running dose.
 - Patients with a high risk for bleeding should be dialyzed using the “no heparin” procedure, supported by:
 - a) normal saline flushes every 30-60 minutes using 100-200 ml of normal saline, or
 - b) continuous saline infusion, and
 - c) as necessary, change the circuit when there are clotting difficulties if greater than 1 hour of hemodialysis is remaining
 - d) regional anticoagulation such as citrate as per specific unit protocol

2.0 DEFINITIONS AND ABBREVIATIONS

GI – gastrointestinal
 CVC – central venous catheter
 AVF – arterio-venous fistula
 AVG – arterio-venous graft

3.0 ASSESSMENT AND INTERVENTIONS

- 3.1 Follow Algorithm attached
- 3.2 After using the adjusted heparin dose for three consecutive runs, obtain new order for adjusted dose

4.0 PATIENT EDUCATION AND RESOURCES

- 4.1 Potential increased risk of bleeding following dialysis treatment.
- 4.2 Advise the doctor or nurse if experiencing bleeding.
- 4.3 Advise the doctor or nurse of any pending or recent procedures.

5.0 DOCUMENTATION

- 5.1 Record on appropriate unit specific treatment record:
 - Heparin dose, loading and running;
 - Any clotting during the hemodialysis treatment;
 - Dialyzer appearance post-dialysis;
 - Clotting time of fistula needle sites post dialysis
- 5.2 Kardex:
 - Record changes in heparin dosage and the date of the change.

6.0 REFERENCES

- 1. Kelowna General Hospital (2003) **Renal Hemodialysis Policy & Procedure** Heparin Adjustment Protocol
- 2. KDOQI Guidelines. (2006). **Clinical Practice Guidelines and Clinical Practice Recommendations** [Electronic Edition].
- 3. Parker, J. (1998). **Contemporary Nephrology Nursing**. Pitman, NJ: Anthony J. Jannetti, Inc.
- 4. Providence Health Care Renal Program (2007) **Nursing Care Standard: NCS6304** Hemodialysis: Heparin Protocol
- 5. Vancouver General Hospital (2004) **Patient Care Guidelines: PCG H-096** Hemodialysis: Heparinization During Hemodialysis – Continuous Infusion

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HEPARIN ALGORITHM

