Saskatoon Health Region	Policies & Procedures Title: **CARDIAC CATHETERIZATION – CARE OF THE CLIENT** I.D. Number: **1087**
Authorization: [X] SHR Nursing Practice Committee	Source: Heart Health Cross Index: Date Revised: November 2013 Date Effective: May 2009 Scope: **SHR Urban Acute Care**

1. PURPOSE

1.1 To ensure a safe outcome following cardiac catheterization.

2. POLICY

Staff who will provide care	• RN/LPN will provide pre/post procedure care • CCA may do site hair clipping
Physician Order Required	• Inpatients at all sites must have a Cardiac Catheterization Services Booking Request (Form #102051) completed by MRP or designate and faxed to the Cardiac Catheterization Lab (Cath Lab) at RUH • Interventional Cardiologist or designate obtains informed, written consent from the client, family or legal guardian
Special Considerations	• Outpatients will be booked by the Cath Lab and admitted to RUH Cardiac Short Stay Unit (CSSU) on the day of the procedure • Clients are triaged prior to the procedure by the Nurse Clinician, Cardiac Catheterization or designate. If the client is in a facility other than RUH, they may be sent pre-procedure to RUH CSSU, CCU or Ward 6000 • Client should be NPO for four hours prior to procedure or as ordered by the Cath Lab. See 3.7 regarding medications • For radial approach, the interventional cardiologist or designate will be responsible to assess for adequate ulnar circulation in the hand which will be used for the procedure • Length of bed rest post-procedure is determined by location, condition of access site, and lingering effects of procedure sedation
Discharge/Transfer	• Outpatient clients may be discharged from CCU/CSSU one to two hours after ambulating, if no complications have occurred • Outpatient clients, upon discharge, must be accompanied and have arranged for transportation. It is recommended that out of town clients remain in Saskatoon overnight with a responsible adult • Clients should not drive for 48 hours after the procedure • Clients sent from SCH or SPH may be transferred back to the sending hospital after two hours, if no complications have occurred. The client will be sent by ambulance (refer to Regional Policy #7311-60-006 Patient/Client Road Transportation Guidelines). The RN/LPN at RUH will phone report to the RN/LPN at sending hospital. Send the complete chart back with client.

	• Out of town clients from referring hospitals may be transferred back by ambulance post procedure at the discretion of the interventional cardiologist • All clients should receive a copy of the discharge instructions. See Appendix C – Discharge Following Angiogram/Percutaneous Coronary Intervention (PCI)

3. PROCEDURE

Pre-Procedure:

The RN/LPN from the sending unit will:

3.1 Do pre-procedure teaching and preparation

3.2 Obtain baseline vital signs and a physical assessment including pulse quality of limbs

3.3 Ensure the client has patent IV access, preferably 20G in the left forearm

3.4 Ensure baseline blood work - CBC, Lytes, PTT and INR (if applicable), 12 Lead ECG, height and weight have been obtained prior to the procedure. (This may be deferred if there are results available which are recent and on the chart.) The Cath Lab must be notified of any abnormal blood work and a Creatinine Clearance less than 60 ml/min.

***Note**: Normal Saline infusion may be ordered for renal protection. Use the protocol found on the back of Orders – Pre and Post Coronary Angiogram (form #101618). See Appendix A.*

3.5 Clip the hair at the anticipated access site (right femoral, right radial or left radial) with surgical clippers.

***Note:** Do not shave the site.*

3.6 Remove all of client's jewellery and contact lenses. Eyeglasses, hearing aids and dentures may be worn by client.

***Note:** Client to wear hospital gown only.*

3.7 Medications

3.7.1 Warfarin: If client is on warfarin, check with MRP or designate regarding holding it and assessing the need for heparin. INR must be less than 1.4 for procedure to proceed.

3.7.2 Heparin: If client is on IV heparin, it is discontinued on call from the cardiologist, Cath Lab Nurse Clinician or designate. Check post procedure orders to determine if/when it needs to be restarted. See Appendix A and B

3.7.3 LMWH, Dabigatran, Rivaroxaban or other oral anticoagulant: Check with MRP or designate regarding holding the dose prior to the procedure and restarting post procedure.

3.7.4 Give all medications including oral cardiac medications, ASA and antiplatelets, unless directed otherwise by the cardiologist. Exception: Hold Metformin and Metformin-containing medications prior to procedure and for 48 hours following unless directed otherwise by the cardiologist. Check with the Cath Lab regarding diuretics, insulin and other oral diabetic agents.

3.8 Give pre-med, if ordered, "on-call" after the consent has been signed

3.9 Transfer client to Cath Lab via stretcher with the current and old charts.

Note: *The Cath Lab porter will be sent during regular working hours.*

Post Procedure

Note*: The client will be returned to the unit via stretcher, accompanied by the Cath Lab porter. An RN will accompany client at the request of the Interventional Cardiologist. If a femostop is in place, the client is to remain on the stretcher until after it is removed. Clients who have had a radial approach should be transferred from stretcher to bed with a RN/LPN assistance.*

The RN/LPN will:

3.10 Upon client's return to the unit, immediately obtain a post-procedure assessment which includes vital signs, condition of puncture site, intactness of dressing and circulation (pulse quality), sensation and movement (CSM) on the limb distal to the access site.

3.11 Ensure any vascular clamp (i.e. femostop, TR radial band), if in place, is in the correct position and adequate pressure is applied.

3.12 Attach arterial sheath, if in place, to a pressure tubing/transducer and monitor (see Hemodynamic Monitoring-Arterial Line Nursing Policy #1101). It is removed as ordered by the physician.

Note: *These clients must go to CCU or CSSU until the sheath is removed.*

3.13 Perform minimum vital signs (heart rate, blood pressure, respirations)

- Q15 min x 1 hour
- Q30 min x 1 hour
- Q hourly x 2 hour

Perform minimum checks of access site and distal circulation

- Q15 min x 1 hour
- Q30 min x 1 hour
- Q hourly x 2 hour
- Q 4 x 18 hours

3.14 Resume client's pre-procedure diet upon return to the unit

3.15 Maintain bed rest as per orders. During bed rest the client should keep the affected limb straight. For client comfort the head of the bed may be elevated 10-20º or reverse trendelenberg may be used. The client may log roll.

Note: *Duration of bed rest is determined by the condition and location of the access site. Bed rest times are as follows unless directed otherwise by the interventional cardiologist:*

- *Femoral access site: minimum of 2 hours post procedure.*
- *Femoral access site with use of a closure device: may sit at 30º immediately, but on bed rest for 2 hours post procedure.*
- *Radial or brachial access site: may ambulate immediately if the nurse determines the effects of the procedure sedation are minimal.*

3.16 Keep puncture site dressing in place until the following morning.

4. REFERENCES

Amy Scheuler, Management of Transradial Access for Coronary Angiography
2012 Journal of Cardiovascular Nursing Month 12

Bridget Shoulders-Odom, Management of Patients After Percutaneous Coronary Interventions
2008 Critical Care Nurse Vol. 28, No.5 October

Nakia Merriweather, Linda M. Sulzbach-Hoke, Managing Risk of Complications at Femoral Vascular Access Sites in Percutaneous Coronary Intervention
2012 Critical Care Nurse Vol. 32, No. 5 October

Strategies to Minimize Vascular Complications following a Cardiac Catheterization 2007 Patient Safety Authority Vol. 4, No.2 June

Survey of Current Canadian Practice from the following sites (2008):

- Toronto General, Toronto Ontario
- University Health Network, Western Site, Toronto Ontario
- Health Science Center, St John's NL
- Victoria, British Columbia
- Kingston, Ontario
- University of Western Ontario, London Ontario

Tagney Jenny, Lackie Dawna, Bed rest post femoral arterial sheath removal - What is safe practice? A clinical audit. 2005 Nursing In Critical Care Vol. 10, No. 4

Vlasic Wendy, et al Reducing Bed rest Following Arterial Puncture for Coronary Interventional Procedures - Impact on Vascular Complications: The BAC Trial 2001 Journal of Invasive Cardiology

Appendix A

Orders – Pre and Post Coronary Angiogram Form #101618

IMPRINT BELOW THIS LINE

SASKATOON HEALTH REGION
Saskatoon, Saskatchewan

❑ RUH ❑ SCH ❑ SPH ❑ OTHER_____

PHYSICIAN'S ORDERS

ALLERGIES:

DATE	TIME	ORDERS AND SIGNATURE **ORDERS – Pre and Post Coronary Angiogram**	PROCESSED TIME	MAR	ICP	REQ	RN
		Patient Weight = _____kg					
		Pre Procedure					
		NPO at _____					
		Groin Prep					
		Insert saline lock left hand / forearm					
		❑ Stat CBC, Lytes 6, ECG on admission					
		❑ Discontinue heparin on call to cath lab					
		❑ diphenhydrAMINE 50 mg po on call to cath lab					
		❑ diazepam _____ mg po on call to cath lab					
		❑ Normal Saline (see reverse for dosing directions) ▪ IV Load _____mL/hr started at_____ hr for 1 hour ▪ Decrease rate to _____ mL/hr during procedure and continue for 4 hrs post-procedure completion					
		❑ Discontinue metformin now. Restart on (date):					
		❑ Other:					
		❑ **Use Post Percutaneous Coronary Intervention Orders**					
		Post Angiogram Procedure (without percutaneous coronary intervention)					
		❑ Resume pre-procedure diet					
		❑ Restart IV heparin at _____hr at previous rate					
		❑ Femstop Begin release of femstop at _____ Release_____ mmHg every _____min. Remove at _____mmHg					
		❑ Closure device: _____ May sit at 30° now					
		❑ Radial Clamp: begin release at _____ hr and every _____min until off					
		Bedrest: ❑ none ❑ 2 hours ❑ 3 hours ❑other_____hrs					
		❑ IV fluids:					
		❑ See next page for additional orders					
		Discharge home: _____ ❑ no follow-up ❑ follow-up with Dr._____in _____weeks					
		Physician's Signature: **Print Physician Name:** _____					

WORD Form # 101618 07/09 Category:Orders ***ANGIO***

Normal Saline Infusion:

Patient Weight	Loading infusion (3 mL/kg/hour x 1 hour prior to procedure)	Maintenance infusion (1.5 mL/kg/hour during procedure and continue 4 hours post procedure completion)
Less than 50 kg	140 mL/hour	70 mL/hour
50 – 54 kg	155 mL/hour	78 mL/hour
55 – 59 kg	170 mL/hour	85 mL/hour
60 – 64 kg	185 mL/hour	94 mL/hour
65 – 69 kg	200 mL/hour	100 mL/hour
70 – 74 kg	215 mL/hour	108 mL/hour
75 – 79 kg	230 mL/hour	115 mL/hour
80 – 84 kg	245 mL/hour	123 mL/hour
85 – 89 kg	260 mL/hour	130 mL/hour
90 – 94 kg	275 mL/hour	138 mL/hour
95 – 99 kg	290 mL/hour	146 mL/hour
Greater than 100 kg	310 mL/hour	150 mL/hour

Brar SS, Shen AYJ, Jorgensen MB, et al. Sodium bicarbonate vs. sodium chloride for the prevention of contrast media induced nephropathy in patients undergoing coronary angiography: a randomized trial. JAMA 2008; 300(9):1038-1046.

Appendix B

Orders – Post Percutaneous Coronary Angiogram Form #101774

IMPRINT BELOW THIS LINE

SASKATOON HEALTH REGION
Saskatoon, Saskatchewan

❑ RUH ❑ SCH ❑ SPH OTHER_____

PHYSICIAN'S ORDERS

DATE	TIME	ORDERS AND SIGNATURE **ORDERS – Post Percutaneous Coronary Intervention**	PROCESSED TIME	MAR	ICP	REQ	RN
		Patient Weight = kg					
		❑ Restart Heparin _____hours post line removal at previous rate					
		❑ Discontinue Heparin					
		Clopidogrel: ❑ 300 mg po now ❑ 600 mg po now					
		❑ Clopidogrel 75 mg po daily, start date_____					
		Acetylsalicylic Acid EC ❑ 81 mg po daily ❑ 325 mg po daily x ____ months					
		❑ Acetaminophen 325 - 975 mg po q4h prn					
		❑ MORPhine 1 - 5 mg IV q1h prn					
		❑ Fentanyl 25 - 75 mcg IV q30 minutes prn					
		For symptomatic bradycardia / hypotension ❑ Normal Saline 250 - 500 mL IV bolus ❑ Atropine 0.5 -1 mg IV push, may repeat once in 3 - 5 minutes					
		❑ IV fluids:					
		ECG on admission to CCU/Unit and with symptoms suggestive of ischemia					
		ECG, CBC, Lytes 6, CK, Troponin at 0600hr the following AM					
		❑ Resume pre-procedure diet					
		Arterial sheath ❑ leave in place; ❑ remove at_____hours ❑ Remove 4 hours after heparin given in cath-lab					
		❑ Closure device: _____ May sit at 30° now					
		❑ Radial Clamp: begin release at _____ and every _____min until off					
		Bedrest: ❑ none ❑ 2 hours ❑ 3 hours ❑ other _____hours					
		❑ See next page for additional orders					
		❑ Use Percutaneous Coronary Intervention with Abciximab, Eptifibatide or Bivalirudin orders					
		❑ May transfer at _____					
		Discharge home: _____ ❑ no follow-up ❑ follow-up with Dr._____in _____weeks					
		Physician's Signature: _____ **Print Physician Name:** _____					

WORD Form # 101774 07/09 Category: Orders ***PCI***

Appendix C

Discharge following Angiogram / Percutaneous Coronary Intervention (PCI)

Medications:

- Resume your current medications unless instructed otherwise by your cardiologist
- If you were taking Metformin (Glucophage, Avandamet, Glycon, Glumetza) for your diabetes prior to your procedure, restart this medication two days following your procedure, unless instructed otherwise by your cardiologist.
- If you were taking Warfarin (Coumadin) prior to your procedure and are now restarting this, you should have your INR (blood work) checked in two to three days by your family doctor.
- If you are taking Dabigatran (Pradax), Rivaroxaban (Xarelto), Apixaban (Eliguis) and are now restarting this, you may need to have your blood work checked in the next few days by your family doctor.
- If you were given a prescription for Plavix (Clopidogrel), Ticagrelor (Brilinta) or Effient (Prasugrel) have this filled today. You **must** take this medication everyday. Do not stop taking this medication without the consent of your cardiologist. Plavix helps to prevent blood clots from forming in blood vessels and newly placed stents.
- If your puncture site is uncomfortable, you may take an over the counter medication for this. (i.e. Tylenol)

Driving:

- Do not drive for 48 hours following your procedure. Your cardiologist may give you added restrictions based on your individual circumstance.
- If you drive a commercial vehicle, ask your cardiologist when you may return to driving.

Return to work / activity:

- Your cardiologist will let you know when you are able to return to work.
- Avoid heavy lifting (over 10 lbs) for the next 5-7 days.
- If you are planning a trip that involves air travel in the next month, talk with your cardiologist to make sure that you are fit to travel.
- If you have questions regarding sexual activity, speak to your cardiologist.

Hygiene

- If you still have a dressing on your puncture site, remove it the next day. Gently wash the area with soap and water and leave it open to air.
- Avoid bathing in a hot bath, swimming or hot tubs for the next week as this may cause the puncture site to bleed. You may take a shower.

Appointments

Your cardiologist has recommended that you see your family doctor for follow-up _____
(A report of your procedure will be sent to your family doctor in the next few days).
You should have blood work in _____days.

If you live out of town and have been discharged the same day as your procedure, it is recommended that you stay in the city overnight.

Radial (wrist) Approach – Discharge Information

- If your wrist site begins to bleed, apply firm pressure for 10 minutes. If you are not able to stop the bleeding, return to the hospital.
- For the next 5-7 days avoid any activity which involves excessive use of that wrist. (i.e. golfing, knitting, computer work)
- Your hand should be its normal color and have normal sensation.
- You may notice some bruising at the puncture site, this is normal and will go away in 2-3 weeks.
- A small lump may remain at the site; this is normal and should go away in 2-4 weeks.

Call your doctor if any of the following occur:

- Your wrist or hand becomes painful, cold, discoloured, swollen or red.
- You develop a fever or drainage from the puncture site.
- You develop severe swelling or pain in your arm above the puncture site.
- You develop sudden shortness of breath.

Femoral (groin) site – Discharge Information

- If your groin puncture site begins to bleed, lie flat and apply firm pressure over the site or have someone else do this for you. Return to the hospital.
- Local tenderness at the site may last for a week.
- Bruising at the site is normal and this should go away in a few weeks.
- An increase in swelling or pain at the site is **not** normal. Call your family doctor. If unable to reach your family doctor, return to hospital.
- A lump the size of your thumb may be felt over the site or develop over the site in the next week. If this gets larger or becomes painful, see your family doctor.
- If you develop signs of infection at the puncture site (redness, swelling or drainage) or develop a fever, call your family doctor.