

	Policies and Procedures RNSP: Advanced RN Intervention Title: DOPPLER ASSESSMENT (ABPI/TBPI) FOR COMPRESSION THERAPY (INITIATING A PLAN OF CARE) I.D. Number: 1018
Authorization (X) SHR Nursing Practice Committee	Source: Nursing Date Approved: January 2017 Scope: SHR & Affiliates

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DEFINITIONS

Ankle Brachial Pressure Index (ABPI) - A valid and reliable non-invasive test to measure the ratio of the systolic blood pressure in the lower extremities to the blood pressure in the arms. It is used to screen clients for the presence and severity of arterial compromise as well as to predict the healability of lower leg wounds.

Client - Used to refer to residents, patients and clients.

Certified Nurse - A nurse that received certification according to the policy for that profession in Doppler assessment for compression therapy.

Compression Therapy - Graduated compression can be achieved through compression garments or compression bandages specially designed to support the circulatory system and increase the circulation in the lower limb. This also includes the use of intermittent pneumatic compression pumps.

Toe Brachial Pressure Index (TBPI) - A non-invasive test to measure the ratio of the blood pressure in the toes to the systolic pressure in the arms. It is used when the ABPI is abnormally high (greater than 1.3) and to screen diabetic clients for the presence and severity of arterial compromise.

Roles:

Registered Nurse (RN) – RNs identified by their manager in targeted practice settings will be certified in this RNSP (Advanced intervention): Doppler Assessment (ABPI / TBPI) for Compression therapy (Initiating a Plan of Care)

Registered Psychiatric Nurse (RPN) – RPN certification for this Speciality Practice is under review by the SHR Nursing Practice Committee. As assigned, currently educated or certified RPNs may continue to provide Doppler Assessment (ABPI/TBPI) for Compression Therapy (Initiating a Plan of Care). RPNs requiring initial certification or education will not be certified or educated until the review is complete.

1. PURPOSE:

- 1.1 To ensure a standardized assessment is provided in defining a safe level of compression therapy (i.e. compression bandaging or garments).

Note: The ABPI and/or TBPI result must be combined with a thorough and holistic assessment in determining the safe level of compression.

- 1.2 To help predict the healability of lower limb wounds and determine appropriate treatment.

2. POLICY:

- 2.1 The RN certified in this RNSP will have first completed the following learning modules/activities prior to performing Doppler Assessment (ABPI / TBPI)for Compression Therapy.

- Attend an educational session on Doppler Assessment (ABPI/TBPI)
- Complete the educational module at <https://www.clwk.ca/wp-content/uploads/2014/10/ABI-Procedures-Education-Module.pdf>
- Complete a competency checklist with a certified RN during the first Doppler Assessment

- 2.2 The Doppler assessment values will be sent to the MRP/RN(NP) along with the lower limb assessment findings and the nurse's interpretation for goals of intervention (i.e. no compression and further consult advised, compression therapy or garments).

- 2.3 Compression therapy greater than or equal to 20 mmHg will not be initiated until:

- an appropriate Doppler assessment is completed
- results determine level of safety of compression
- a signed MRP/RN(NP) order is received

- 2.4 A client who has been assessed by a vascular specialist and orders are received for compression therapy does not require an ABPI/TBPI to be completed by the nurse.

- 2.5 Clients with diabetes require a TBPI when the ABPI result is above 1.3 mmHg.

Note: In rural Home Care the nurse must contact the MRP/RN(NP) or complete a Wound Resource Referral form as further assessment is required (i.e. TBPI or vascular assessment)

- 2.6 ABPI results equal to or greater than 1.3 mmHg or equal to or less than 0.7 mmHg or TBPI results equal to or less than 0.4 mmHg should be referred to the MRP/RN(NP) for further vascular assessment (see Appendix A).

- 2.7 Reassessment of ABPI/TBPI is required every 6 months or when limb changes have occurred for clients:

- With lower limb wounds where the goal of therapy is healing
- Receiving compression therapy
- When limb pain increases and is unrelated to infection
- When Increasing signs of arterial insufficiency are present

3. PROCEDURE:

- 3.1 **ABPI – Handheld Manual Doppler**

3.1.1 **Supplies:**

- Doppler Ultrasound (5 or 8 MHZ)

- Portable manual blood pressure cuff of the appropriate size
- Conducting ultrasound gel
- gloves
- Non-adherent low profile cover dressing for wound (if present)
- Facial tissue or cloth
- Calculator
- Disinfectant wipe
- Alcohol based hand rub

3.1.2 Prior to procedure client must rest in a comfortable supine position for 15 minutes.

3.1.3 Explain procedure including any risks and the care that will follow.

3.1.4 Perform hand hygiene.

3.1.5 Place the blood pressure cuff around the client's arm (ensure correct size cuff).

Note: Use non-adherent low profile dressing under the cuff if client has broken skin.

3.1.6 Locate the brachial artery by initially palpating for the arterial pulse and then apply a pea-sized amount of ultra-sound gel over the pulse.

3.1.7 Switch the Doppler on. Hold the probe per manufacturers's instructions. Once the pulse is found and the best sound is located keeping the probe still.

3.1.8 Inflate the cuff while holding the probe over the pulse until any sound disappears, then pump up the cuff 20-30 mmHg higher.

3.1.9 Slowly deflate the cuff and when the first sound reappears this indicates the systolic pressure. Note this result.

3.1.10 Repeat the procedure for the other arm and note the result.

3.1.11 Apply the appropriately sized blood pressure cuff just above the malleoli (ankles) to cover the gaiter area.

Note: Use non-adherent low profile dressing under the cuff if client has broken skin.

3.1.12 Two pedal pulses will need to be used (dorsalis pedis and posterior tibial pulse). Each one is done separately. Locate the first pedal pulse by palpitation, if possible.

3.1.13 Apply ultrasound gel and position the probe.

3.1.14 Inflate the cuff while holding the probe over the pulse until any sound disappears, then pump up the cuff 20-30 mmHg higher.

3.1.15 Slowly deflate the cuff and when the first sound reappears this indicates the systolic pressure. Note this result.

3.1.16 Repeat procedure for the other pulse and note the result.

3.1.17 Repeat the procedure for both pulses on the other leg and note the results.

3.1.18 Calculate ABPI for both the left & right leg using the following formula:

ABPI = highest systolic pressure of the dorsalis pedal or posterior tibial arteries
highest of the right or left brachial systolic blood pressure

- 3.1.19 Following the procedure provide the results, interpretation and recommendations to the MRP/RN(NP) (see Appendix A).
- 3.1.20 Provide the MRP/RN(NP) with abnormalities that occurred during the procedure (i.e. unable to lay flat).

3.2 ABPI – Automated Duplex Doppler

3.2.1 Supplies:

- Dopplex Ability machine
- Four dual chamber cuffs with colour coded tubes of the appropriate size
- gloves
- Non-adherent low profile cover dressing or plastic sleeve for wound (if present)
- Disinfectant wipe
- Alcohol based hand rub

3.2.2 Assist client into a comfortable supine position.

3.2.3 Explain procedure including any risks and the care that will follow.

3.2.4 Plug in the machine and turn on.

3.2.5 Connect the cuffs into the machine according to the color coded tubing.

3.2.6 Press the PLAY button to progress to cuff placement screen and position the cuffs on the client.

3.2.7 Use appropriate sized cuffs for the limbs and ensure all cuffs are fitted correctly and aligned on the limbs according to the instructions.

Note: Use non-adherent low profile dressing under the cuff if client has broken skin.

3.2.8 Press PLAY to start measurement. The results will be displayed within 3 minutes.

3.2.9 Press the CHECK MARK button to view the ABPI interpretation.

Note: If a “?” symbol appears is displayed perform a manual Doppler reading on that limb.

3.2.10 Press the PRINT button to print the results and attach to the client’s chart.

3.2.11 Perform TBPI if indicated.

3.2.12 Perform hand hygiene.

3.2.13 Following the procedure provide the results, interpretation and recommendations to the MRP/RN(NP).

3.2.14 Provide the MRP/RN(NP) with abnormalities that occurred during the procedure (i.e. unable to lay flat).

3.3 TBPI – Manual Handheld Doppler

3.3.1 Supplies:

- Doppler Ultrasound (5 or 8 MHz)
- Portable manual blood pressure cuff of the appropriate size
- Handheld manual toe cuff inflator and cuffs of the appropriate size
- Conducting ultrasound gel
- gloves
- Non-adherent low profile cover dressing for wound (if present)
- Facial tissue or cloth
- Calculator
- Disinfectant wipe

3.3.2 Follow ABPI steps 3.1.1 – 3.1.10.

3.3.3 Apply the toe pressure cuff to the appropriate toe (great toe is preferred but the second may be used if needed).

3.3.4 Apply ultrasound gel on the toe pad. Hold the probe per manufacturers's instructions. Once the pulse is found and the best sound is located keep the probe still.

3.3.5 Inflate the cuff whilst holding the probe over the pulse until any sound disappears, then pump up the cuff 20-30mmHg higher.

3.3.6 Slowly deflate the cuff and when the first sound reappears this indicates systolic pressure.

3.3.7 Document this value.

3.3.8 Repeat the procedure on the other leg.

3.3.9 Calculate the TBPI using the following formula:

$$\text{TBPI} = \frac{\text{toe systolic pressure}}{\text{Highest right or left brachial systolic BP}}$$

3.3.10 Following the procedure provide the results, interpretation and recommendations to the MRP/RN(NP).

3.3.11 Provide the MRP/RN(NP) with abnormalities that occurred during the procedure (i.e. unable to lay flat).

3.4 Cleaning of Equipment

3.4.1 Don PPE and clean Doppler ultrasound/automated ABPI with appropriate disinfectant wipes and let air dry.

3.5 Interpretation & recommendations for initiation of care

3.5.1 The nurse will make recommendations based on the arterial pressures (Appendix A) and the client's lower limb assessment.

3.5.2 The assessing nurse will send all values obtained along with written recommendations for the initiation of care to the MRP/RN(NP).

Note: Home Care - Preprinted orders (Appendix B) for compression bandaging/garments will accompany the recommendations for the MRP/RN(NP)'s signature if indicated.

3.6 Documentation

3.6.1 All testing results and recommendations should be documented on client's record

4. REFERENCES

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Doppler Assessment Interpretation & Recommendation for Initiation of Care

Interpretation of ABPI/TBPI in Determining Compression		
ABPI Value	Interpretation/Clinical Significance	Compression Therapy
Greater than 1.3	Abnormally high range, renders ABPI test – TBPI indicated, Contact the Wound Care Clinician and MRP/RN(NP)	Incompressible arteries
1.0-1.29	Normal	High compression
0.8-.99	Borderline to mild obstructions/ peripheral arterial disease	High compression
0.71-0.79	Mild to moderate obstruction/ peripheral arterial disease	Modified compression
Less than or equal to 0.7	Contact the Wound Care Clinician and MRP/RN(NP)	Contra-indicated unless ordered by specialist
TBPI Value	Interpretation/ Clinical Significance	Compression Therapy
Greater than or equal to 0.7	Normal	High compression
.41-0.69	Mild to moderate peripheral arterial disease	Modified compression
Less than or equal to 0.4	Severe ischemia – Contact the Wound Care Clinician and MRP/RN(NP)	Contra-indicated

Adapted from the Provincial Lower Extremity Wound Pathway 2016

Appendix B



Saskatoon Home Care
201-310 Idylwyld Drive
Saskatoon, SK S7L 0Z2
Phone: (306)655-4300
Fax: (306)655-4400

Client's Label in this box

Physician's Name: _____
RN/LPN USE ONLY (not for physician signature)

PHYSICIAN'S/RN (NP) COMPRESSION ORDERS

In case of an **Anaphylactic Reaction** the RN/RPN/LPN is authorized to give **Epinephrine Hydrochloride (Adrenalin) 1:1000** by intramuscular injection into the antero- lateral thigh according to the following table:

50 kg or greater (Adult Dose): 0.5 mL							
Weight	Dose (mL)	Weight	Dose (mL)	Weight	Dose (mL)	Weight	Dose (mL)
10 kg	0.1 mL	20 kg	0.2 mL	30 kg	0.3 mL	40 kg	0.4 mL

Epinephrine dose may be repeated twice at 5 minute intervals if necessary, for a total of three doses.
Arrange for rapid transport to an emergency department.

DATE	Orders and Physician/ RN (NP) Signature		For Home Care RN/LPN Only		
			RN/LPN Initials & Date fax sent	Transcribed to Flow Sheet	RN/ LPN Signature
<p><u>Compression Bandaging</u></p> <p><input type="checkbox"/> LT Leg <input type="checkbox"/> RT Leg <input type="checkbox"/> Both</p> <p><u>Type of Compression:</u></p> <p><input type="checkbox"/> Coban 2 Regular (30-40 mmHg)</p> <p><input type="checkbox"/> Coban 2 Lite (20-30 mmHg)</p> <p><input type="checkbox"/> Comprilan (30-40 mmHg)</p> <p><input type="checkbox"/> Complex Co-Morbidities Protocol</p> <p>* Substitute with tubular bandage (i.e. Tubigrip) (2 layers) if no coban 2 available *if client has latex allergy a non-latex tubular bandage may be ordered</p> <p>*Frequency per protocol</p>	<p><u>Compression Stockings</u></p> <p><input type="checkbox"/> 30-40 mmHg</p> <p><input type="checkbox"/> 20-30 mmHg</p>				
		Prescriber Signature			Date: