

h625 → h645

Ankle-Brachial Doppler Blood Pressure Measurement

Purpose

The ratio of the ankle blood pressure to the arm blood pressure provides a measure of lower extremity arterial disease (circulation problems).

A. Equipment:

1. 8 megahertz Doppler pen probe
2. Ultrasonic Doppler Flow Detector
3. Doppler conducting jelly
4. Standard mercury column sphygmomanometer
5. Calibrated V-Lok Cuff® comes in three sizes:
 - 4 large adult cuffs
 - 4 pediatric cuffs
 - 4 regular adult cuffs
 - 2 thigh cuffs
6. Washcloths to remove conducting jelly

B. Exclusions

Lower Extremity Exclusions

1. Persons with venous stasis ulceration or other pathology that precludes placing a BP cuff around the ankle (e.g. open wounds).

Code as 1

2. Persons with bilateral amputations of legs.

Code as 2

3. Persons with rigid arteries such that an occlusion pressure cannot be reached

Code as 3= Other

Upper Extremity Exclusion

1. If a subject has undergone a mastectomy, blood pressure measurement will be excluded in that extremity only, and recorded as 1= mastectomy.

Note: If a subject refuses or does not complete the exam, code as a 3 (Other) and write in the reason.

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C. Set-up Procedure:

1. Ask participant to remove shoes and stockings so that the ankles are bare to mid-calf.
2. Lay participant supine on the examining table.
3. Keep participant supine for at least five minutes before measuring BP.
4. Place four BP cuffs on the participant (be sure to check for appropriate cuff size):
 - a. Right arm
 - b. Right ankle
 - c. Left ankle
 - d. Left arm
5. Apply ankle cuffs with midpoint of bladder over posterior tibial artery, with lower end of bladder approximately 3 cm above medial malleolus.

D. General Guide to Blood Pressure Readings:

For each participant, determine the maximal inflation level, or the pressure to which the cuff is to be inflated for blood pressure measurement. This assures that the cuff pressure at the start of the reading exceeds the systolic blood pressure and thus allows the first Kortokoff sound to be heard.

1. Attach the cuff tubing to the sphygmomanometer.
2. Palpate the brachial artery pulse for the right arm
3. Inflate the cuff rapidly until the brachial artery pulse is no longer heard by inflating rapidly to 70 mmHg, then inflating by 10mmHg increments.
4. The examiner's eyes should be level with the mid-range of the manometer scale and focused at the level to which the pressure will be raised.
5. Deflate the cuff quickly and completely.
6. The maximal inflation level is 30 mmHg **above** the systolic pressure.
7. Repeat procedure for right posterior tibial artery in the ankle.
8. Following any previous inflation, wait at least 30 seconds after cuff has completely deflated.

E. Right Arm Systolic Blood Pressure Measurement:

1. Attach right arm cuff tubing to manometer.
2. Apply ultrasound jelly over brachial artery.
3. Locate brachial artery using Doppler pen probe.
4. **Hold the Doppler probe *absolutely* still.** It can easily slip off the artery.
5. Measure the systolic blood pressure:
 - a. Inflate cuff quickly to maximal inflation level (30 mmHg above systolic pressure).
 - b. Deflate at 2 mmHg/second, to appearance of systolic pressure.
 - c. Follow down for 10 mmHg. Two subsequent beats should be heard for any valid systolic blood pressure reading.
 - d. Remove Doppler pen probe.
 - e. Deflate cuff quickly and completely.
6. Neatly record systolic blood pressure.

F. Right Ankle Systolic Blood Pressure Measurement:

1. Connect right ankle cuff to the manometer.
2. Apply ultrasound jelly over posterior tibial artery.
3. Locate posterior tibial artery using Doppler pen probe.
4. **Hold the Doppler probe *absolutely* still.** It can easily slip off the artery.
5. Measure the systolic blood pressure:
 - a. Inflate cuff quickly to maximal inflation level (30 mmHg above systolic pressure).
 - b. Deflate at 2 mmHg/second to appearance of systolic pressure.
 - c. Follow down for 10 mmHg. Two subsequent beats should be heard for any valid systolic blood pressure reading.
 - d. Remove Doppler pen probe.
 - e. Deflate cuff quickly and completely.
6. Neatly record ankle systolic blood pressure.

G. Repeat Section F for Left Ankle**H. Repeat Section E for Left Arm**

NOTE: If the posterior tibial pulse cannot be found with palpation or Doppler pen probe, use the dorsalis pedis artery for the measurement. Have another examiner verify the absent posterior tibial pulse.

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I. Repeat of Ankle and Arm Blood Pressure Measurements:

1. Repeat the sequence of measures in reverse order:
 - a. Left arm
 - b. Left ankle
 - c. Right ankle
 - d. Right arm

NOTE: If initial and repeat blood pressures measured at any one site (Right arm, Left arm, Right ankle or Left ankle) differ by more than 10 mmHg, please take a third measurement at that site.

J. For Ankle Measurements record which sites the measurement was taken from

0= posterior tibial (ankle)

1=dorsalis pedis (foot)

K. Record any lower or upper extremity exclusions on data form

L. Note any protocol modifications on data form

M. Completion:

1. Review form for completeness and legibility.
2. Remove cuffs and conducting jelly.

Ankle-Brachial Blood Pressure is not done on Offsite Visits

Doppler Ankle Brachial Blood Pressure Measurements. Tech- Obtained

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SYSTOLIC BLOOD PRESSURES BY DOPPLER (to be taken in the following order with participant supine after 5 minutes of rest)

h624	_ _	Examiner's Number for Doppler Ankle Brachial Blood Pressure	
h625	_ _	Cuff size, arm	0= pediatric, 1= regular adult 2= large adult, 3= thigh
h626	_ _	Cuff size, ankle	

h627	_ _	Right arm	
h628	_ _	Right ankle	300= \geq 300
h629	_ _	Left ankle	999= Unknown or not done
h630	_ _	Left arm	

REPEAT SYSTOLIC BLOOD PRESSURE MEASUREMENTS (reverse order)

h631	_ _	Left arm	
h632	_ _	Left ankle	300= \geq 300
h633	_ _	Right ankle	999= Unknown or not done
h634	_ _	Right arm	

THIRD SYSTOLIC BLOOD PRESSURE MEASUREMENT (order as in repeat SBP). To be obtained if initial and repeat SBP at any site differ by more than 10 mmHg

h635	_ _	Left arm	
h636	_ _	Left ankle	300= \geq 300
h637	_ _	Right ankle	999= Unknown or not done
h638	_ _	Right arm	

h639	_ _	Right Ankle blood pressure site	0= posterior tibial (ankle) 1= dorsalis pedis (foot)
h640	_ _	Left Ankle blood pressure site	

EXCLUSIONS:

	Right	Left	
h641/h642	_ _	_ _	Lower Extremity Exclusions 0= None, 1= venous stasis ulceration, 2= amputation, 3= other
h643/h644	_ _	_ _	Upper Extremity Exclusions 0= None, 1=Mastectomy, 3= Other

h645	_ _	Protocol modification, write in _____	0= No, 1= Yes 2= Incomplete/ refused
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