Vascular Assessment & Ankle Brachial Blood Pressure Indices

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No Disclosures

Abstract

The diagnosis of peripheral arterial disease is frequently made only after permanent damage has occurred; resulting in high rates of morbidity and potential amputation. A proper physical examination is crucial to distinguish arterial insufficiency from less limb-threatening conditions; such as venous insufficiency, and infectious and lymphatic-related processes. Often several etiologies need to be considered simultaneously. This session will review the principals of the vascular examination of the lower extremity and detail the role of ankle brachial index (ABI) testing in the diagnosis of arterial insufficiency.

Abstract

The diagnosis of peripheral arterial disease is frequently made only after permanent damage has occurred; resulting in high rates of morbidity and potential amputation. A proper physical examination is crucial to distinguish arterial insufficiency from less limb-threatening conditions; such as venous insufficiency, and infectious and lymphatic-related processes. Often several etiologies need to be considered simultaneously. This session will review the principals of the vascular examination of the lower extremity and detail the role of ankle brachial index (ABI) testing in the diagnosis of arterial insufficiency.

Objectives

- Focused history
- Proper differential diagnosis – Arterial is priority.
- Thorough lower extremity vascular examination.
- Role of Ankle-Brachial Indices (ABI)

Case 1

- 74 yo female
- Known atrial fibrillation
- Off of Warfarin for dental procedure.
- Sudden onset of pain in left leg.

What next?

- Order duplex to rule out DVT?
- Order plain x-ray to rule out fracture?
- Imaging to rule out arterial event?

Case #2

70 yo male

Complains of pain in great toe.

Case #2

Diagnosis?

Ingrown toenail

Trauma

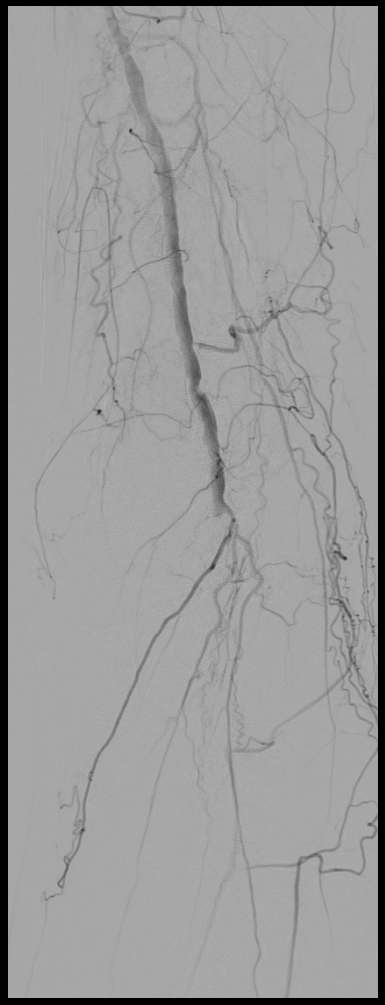
Ischemia

Infection

Case #2

Treated as ingrown toenail

Case #2



Inspection

- Overall health
- Position in which the foot is held.
- Hair pattern.
- Pattern and location of ulceration.
- Shape of affected foot.
- Missing contralateral limb or Digits?

Inspection

- Colour of affected foot.
- Effect of elevation.
- Venous Filling Time.

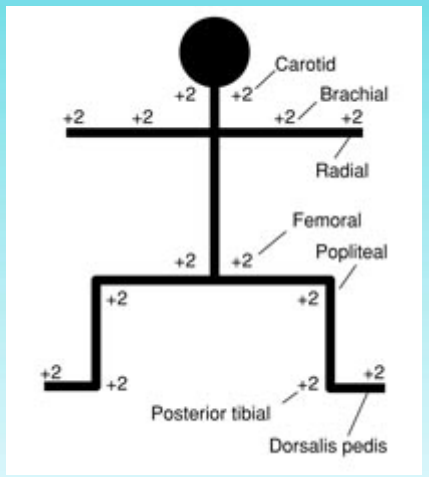
Inspection

Palpation

- Temperature
- Tenderness
- Sensation
- Capillary Refill

Palpation

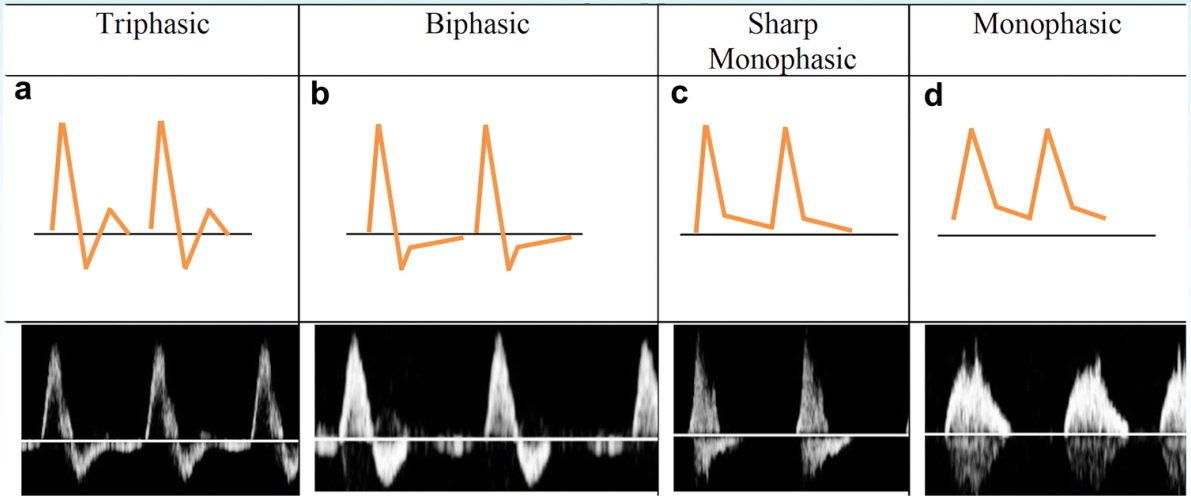
- Pulses



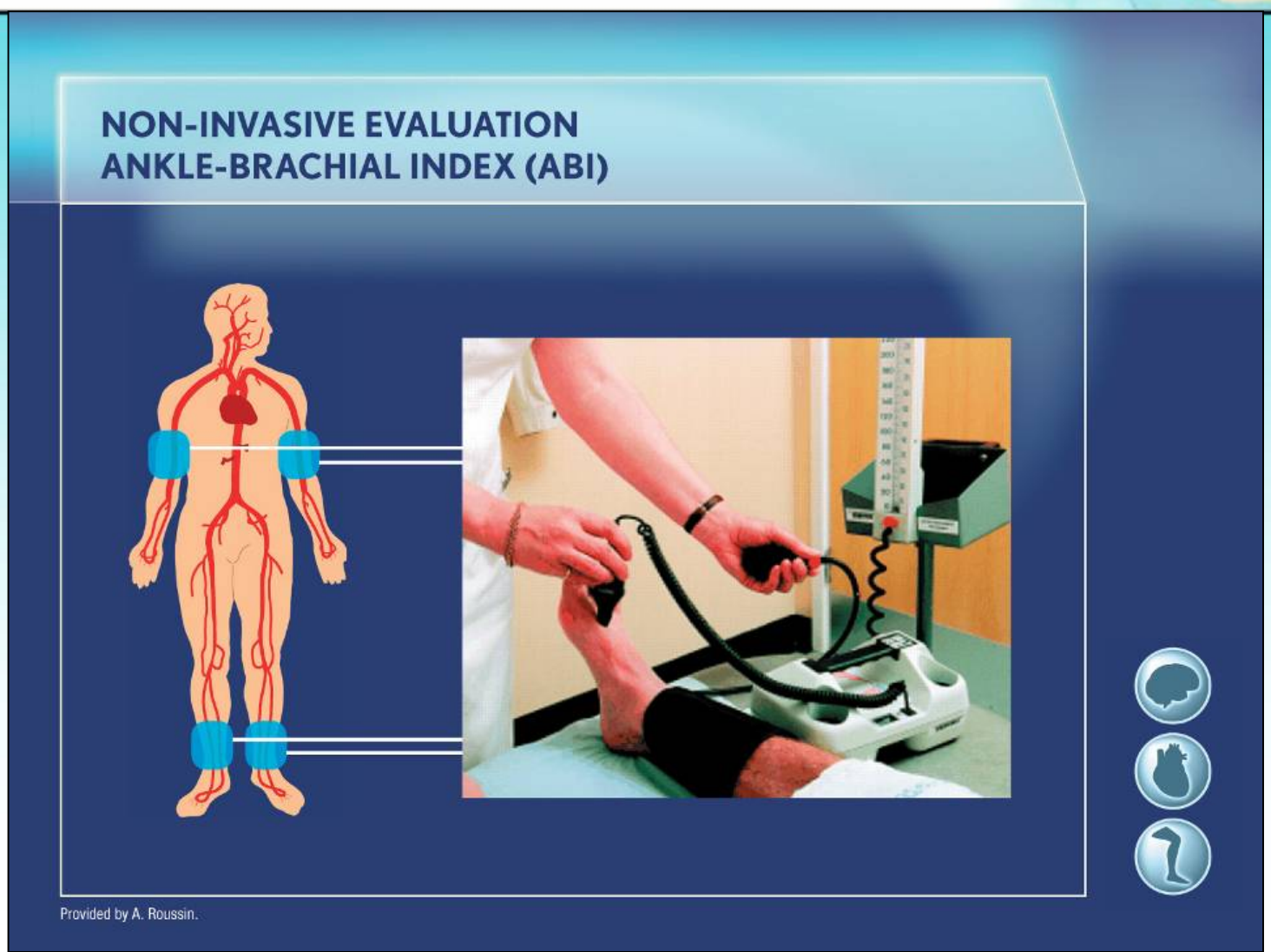
Grade	Description
0	No pulse
1+	A faint, but detectable pulse
2+	A slightly more diminished pulse than normal
3+	normal pulse
4+	Bounding pulse

Auscultation?

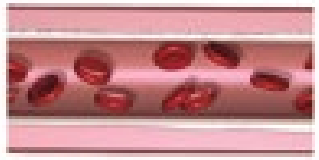
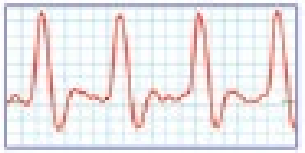
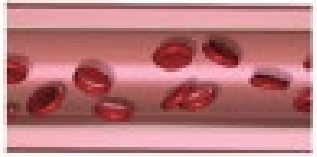
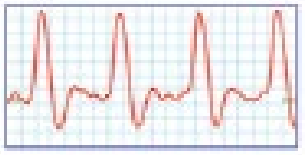
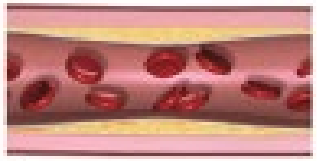
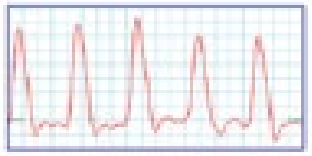
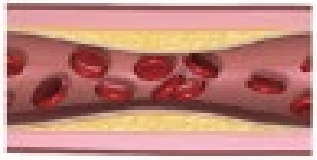
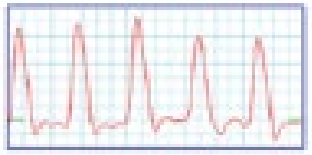
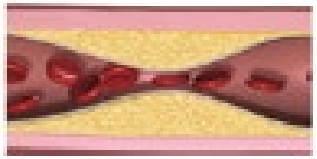
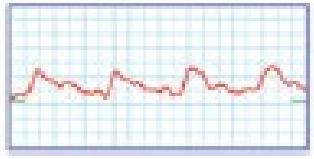
- IPPA (inspection, palpation, ~~percussion~~, auscultation)
- Use of Doppler -8 Hz
- Absent, mono, bi-, or tri-phasic waveforms.



Ankle Brachial Index



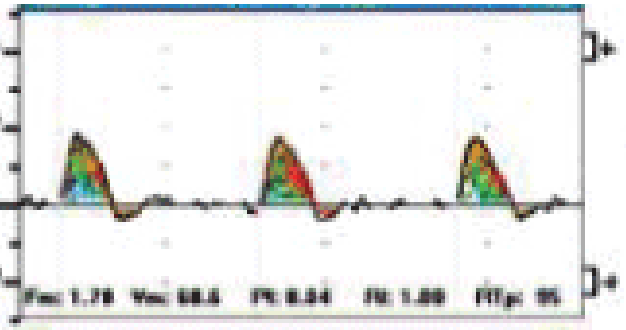
Ankle Brachial Index

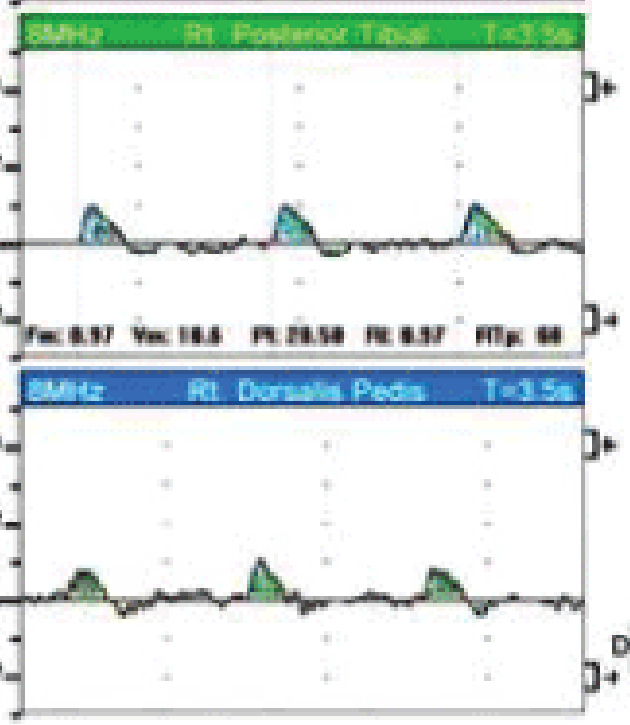
		ABI	
Calcified Vessel		> 1.3	
Normal		0.9 - 1.3	
Mild PAD		0.7 - 0.89	
Moderate PAD		0.51 - 0.69	
Severe PAD		≤ 0.5	

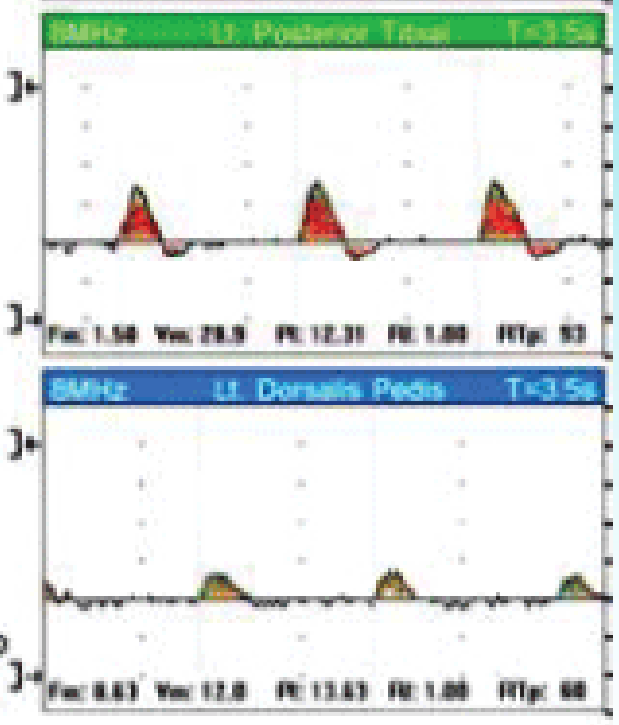
Toe Brachial Index

	Toe pressure (mmHg)	TBI
Calcified Vessel	------	unaffected
Normal	>70	> 0.6
Mild PAD	40-69	0.34 - 0.59
Moderate PAD	14-39	0.12 - 0.34
Severe PAD	<14	≤ 0.11

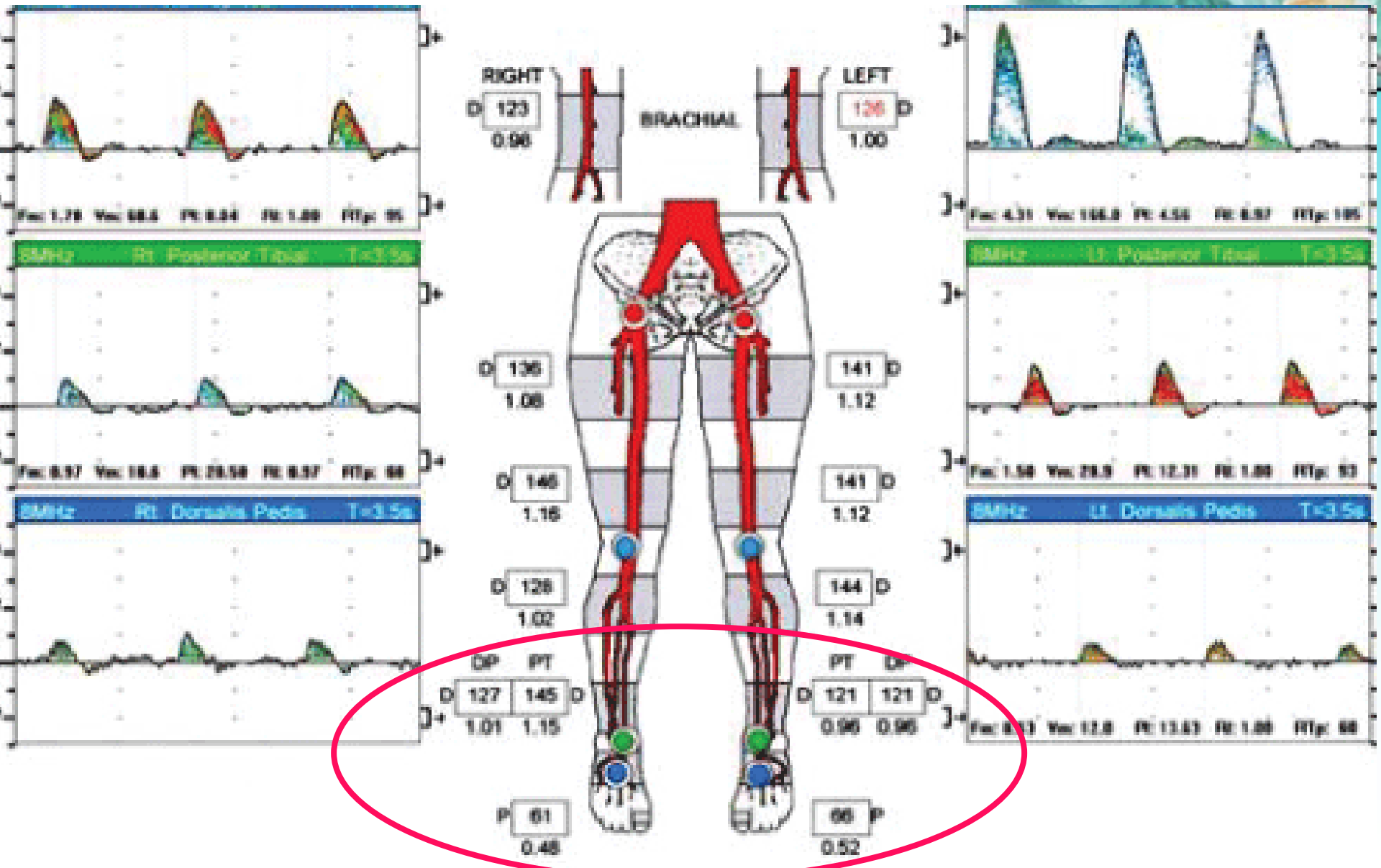
Ankle Brachial Index







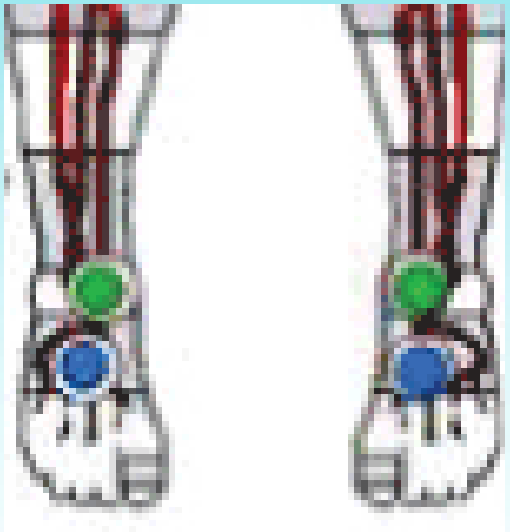
Ankle Brachial Index



Ankle Brachial Index

Normal

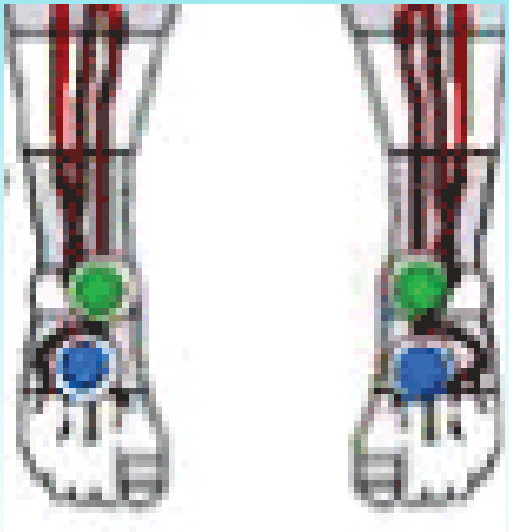
	DP	PT		PT	DP
Pressure	127	145		121	121
ABI	1.01	1.15		0.96	0.96
Pressure	61			66	
TBI	0.48			0.52	



Ankle Brachial Index

Diabetic

	DP	PT		PT	DP
Pressure	127	145		121	121
ABI	1.45	1.49		1.41	1.41
Pressure	40			44	
TBI	0.34			0.40	



Conclusion

- History helps focus examination.
- Differential diagnosis – rule out arterial first!
- Vascular examination: inspection, palpation, auscultation (doppler).
- ABI helpful in making diagnosis and for guiding therapy.
- TBI/toe pressures reliable in patients with calcified vessels.