

NOTE 3 Venous Investigation Of The Lower Limb Using PPG

HOW TO USE THIS APPLICATION NOTE

- **PATIENT SYMPTOMS** Verify that your patient's symptoms correspond to one or more of those listed in Figure 1.
- **DOPPLEX® EQUIPMENT REQUIRED** Select the most appropriate Pocket unit to perform the examination. For suggestion of suitable equipment, refer to Figure 2.
- **PROCEDURE** Connect your *Rheo Dopplex® II* to the *Dopplex® Printa II* Package or *Reporter* Software Package (and a computer), and begin your examination, refer to Figure 3.
- **TOURNIQUET POSITION** Figure 4 suggests position for Tourniquet.
- **EXAMINATION RESULTS** Taking careful note of your *Rheo Dopplex® II* display and venous waveforms, refer to Figure 5 overleaf and compare your examination results with those shown.
- **NOTES** Refer to Figure 6 overleaf for general notes relating to this form of examination for venous incompetence.
- It is **ESSENTIAL** that the PPG curve is used to confirm the Refill Time.

FIGURE 1 PATIENT SYMPTOMS

- SWELLING
- VENOUS ULCERS
- VARICOSE VEINS
- VARICOSE ECZEMA
- VENOUS EDEMA
- POST-THROMBOTIC SYNDROME

FIGURE 2 DOPPLEX EQUIPMENT REQUIRED

- *Rheo Dopplex® II*.
- *Dopplex® Printa II* or *Dopplex® Reporter* Software package.

FIGURE 3 PROCEDURE

- Remove footwear and stockings.
- Place foot on insulated mat.
- Adjust height to minimize weight on feet.
- Obese patients should be reclined to reduce venous compression.
- Fit sensor 10cm above the medial malleolus (use length of blue cable).
- Ensure patient is relaxed ie., pulse rate stable
- Undertake exercise routine.

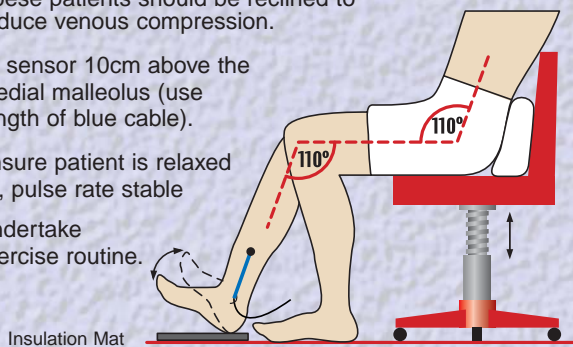
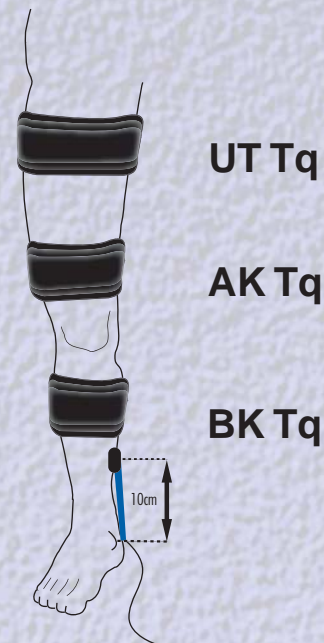


FIGURE 4 TOURNIQUET POSITION

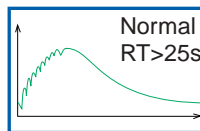


Tourniquet Position	Limb Size		
	S	M	L
UT Tq = Upper thigh	60	70	80
AK Tq = Above knee	60	70	80
BK Tq = Below knee	40	50	60

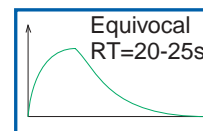
FIGURE 5 EXAMINATION

NORMAL

If Refill Time (RT) is greater than 25 seconds, then venous insufficiency is not present or is not significant.



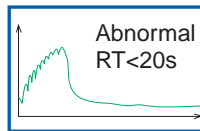
Venous refill from arterial inflow



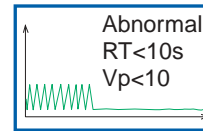
Some venous reflux present

ABNORMAL

If Refill Time (RT) is less than 20 seconds, then venous reflux is present. Apply the tourniquet cuff at the appropriate positions to determine the level of venous insufficiency, (See flowchart below).



Venous incompetence present



Deep venous obstruction/insufficiency

DECISION MAKING FLOWCHART FOR VENOUS INCOMPETENCE

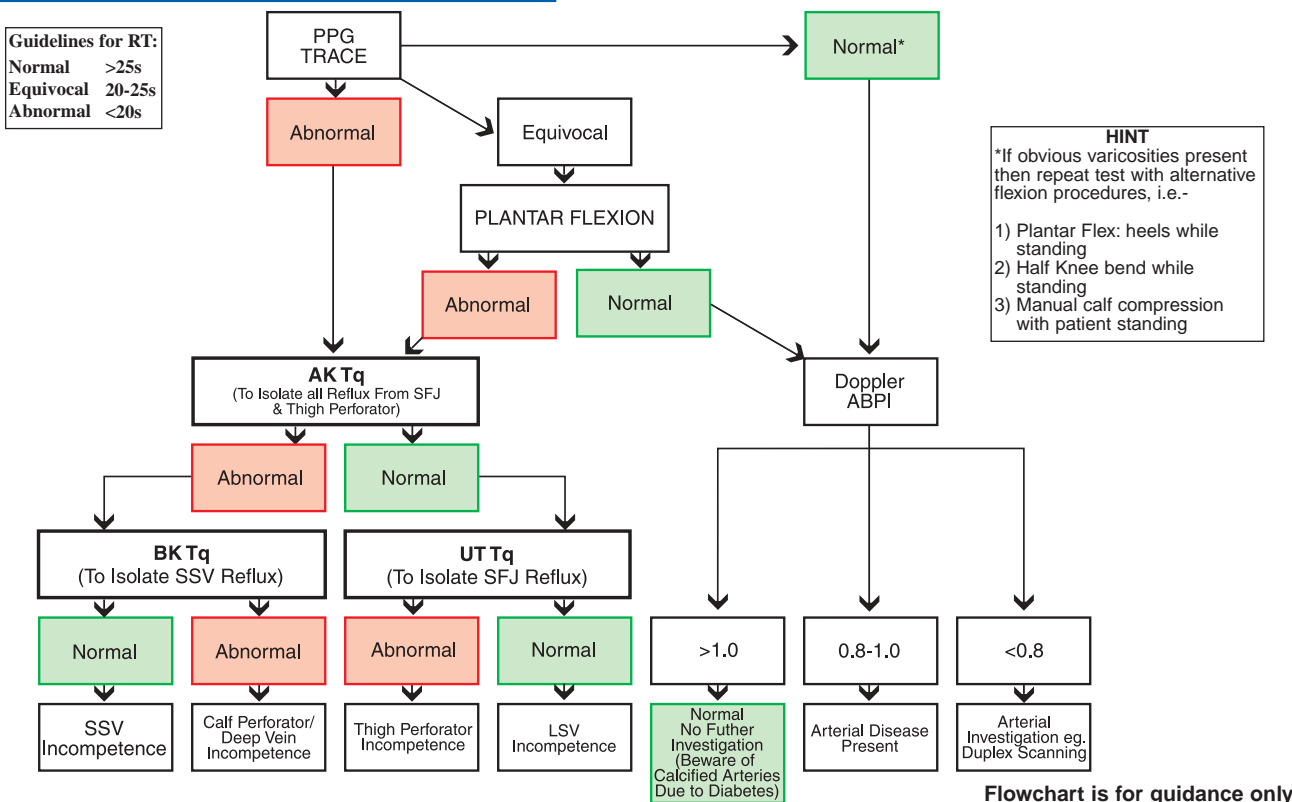


FIGURE 6 NOTES

Differentiation between deep vein and calf perforator incompetence is not possible with PPG. In these cases, further investigation, i.e. Duplex scanning should be undertaken. Patients with gross edema could produce normal results with venous incompetence present.

References: McEnroe, CS, O'Donnell ThF, Mackey WC. Correlation of clinical findings with venous hemodynamics in 386 patients with chronic venous insufficiency. 156;148-52
 Neumann H.A.M., Boersma IDS. Light Reflection Rheography - A Non-invasive diagnostic Tool for Screening for Venous Disease. J. Dermatol Surg Oncol. 1992; AmJ.Surg 18:425-430
 Our thanks go to Dr. Mo Aslam, Dept of Surgery, Hammersmith Hospital, London, UK

EDUCATIONAL MATERIAL AVAILABLE FROM HUNTLEIGH DIAGNOSTICS

- Library of Sounds Audio Cassette
- Assessment & Treatment of Leg Ulcers Video
- Vascular Investigations Video
- Assessment of the Diabetic Foot Video
- ABPI & TBPI guides.

APPLICATION NOTES AVAILABLE FROM HUNTLEIGH DIAGNOSTICS

- NOTE 1** • Arterial Investigation Of The Lower Limb
- NOTE 2** • Venous Investigation Of The Lower Limb Using Doppler
- NOTE 3** • Venous Investigation Of The Lower Limb Using PPG
- NOTE 4** • Screening For The Absence Of An Acute DVT Using PPG
- NOTE 5** • Using A Hand Held Doppler To Assist With PICC Placement

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