



# Promoting Excellence In Ultrasound

## **Policies and Statements**

# **D18**

## Penile Doppler Ultrasound

## Policies and Statements

### D18

#### Penile Doppler Ultrasound

May 2006 (Reaffirmed July 2007)

### SECTION 1: INSTRUMENTATION

#### Essential Equipment

Regular equipment maintenance is to be performed on all equipment used for vascular ultrasound. The duplex Doppler ultrasound machine is used to provide simultaneous or sequential real-time greyscale (B-mode) imaging of the vessel wall and plaque analysis of the angle corrected Doppler frequency spectrum from a selected sample volume within the vessel lumen. As well as the essential characteristics of both B-mode imaging and duplex Doppler spectral analysis for quantification of blood flow velocities (or Doppler frequency shift) the ultrasound machine should have colour Doppler imaging. Colour Doppler provides a qualitative, simultaneous display of flow information superimposed on the real time greyscale image.

Required characteristics:

- ◆ Imaging frequencies as specified in anatomic regional sections
- ◆ Range-gated Doppler with the ability to adjust the position and size of the range gate/sample volume
- ◆ Provision for the measurement and display of the Doppler angle
- ◆ Provision of visual and audible output of Doppler signal
- ◆ Provision for hard copy or other form or recording

#### Specific Characteristics - Duplex ultrasound

- Imaging frequencies of 5.0 MHz or greater.
- Doppler frequencies of at least 3.0 MHz
- Linear array transducer/s.
- Colour Doppler capability.

#### Secondary Instrumentation

CW Doppler with transmitting frequencies of 8-10 MHz.  
Sphygmomanometer and appropriate sized cuffs.  
Photoplethysmography (PPG).

### SECTION 2: INDICATIONS AND TECHNIQUES

#### Indications

Penile Doppler ultrasound is performed for the evaluation of erectile dysfunction.

#### Techniques

Appropriate techniques shall be used for evaluation of the penile circulation.

- **Duplex Doppler/Colour Doppler**

The major vessels of the penis are to be evaluated including the cavernosal arteries before and after the administration of a vasoactive agent. The inflow vessels including the Aorta, common iliac and internal iliac arteries may also be examined if indicated.

Both imaging and Doppler information should be used to identify and evaluate these vessels.

Vessel anatomy and morphology should be documented with high quality imaging.

Using spectral and colour Doppler the haemodynamics of the cavernosal arteries should be studied and representative waveforms and velocity measurements recorded. Temporal monitoring of the Doppler velocities after the administration of a vasoactive agent is important. Velocity measurements should be made with a Doppler angle of 60 degrees or less.

- **Other procedures**

Might include penile/brachial indices using CW Doppler or PPG.

### **SECTION 3: DIAGNOSTIC CRITERIA**

Accepted diagnostic criteria should be used to assess the presence and severity of pathology in the penis and/or inflow vessels.

The primary purpose of the duplex examination is to determine inflow to and outflow from the penis and if disease is present, to document its nature, location, extent and severity.

#### **Duplex and Colour Doppler**

##### ***Arterial insufficiency and venous leakage***

The haemodynamics of the penis are determined according to waveform changes after administration of a vasoactive agent. Acceptable criteria for classification of arterial insufficiency and venous leakage are required. These criteria are based on multiple parameters such as vessel diameter, peak systolic and end-diastolic velocity. Whether based on published reports or internally generated data, criteria should be internally validated.

Colour Doppler imaging facilitates the identification of vessels and therefore guides the placement of the Doppler range-gate.

##### ***Penis Morphology***

B-mode imaging should identify areas of abnormal echogenicity in the corpora cavernosa. Vessel diameters are measured from the B-mode image.

A detailed description of the diagnostic criteria used for each examination should be able to be provided. This should accompany any charts, graphics or formulae used in the interpretation of the examination results. Specific references, including text or article, author, date, name and volume number of journal, or name of text and publisher should be provided.

Diagnostic criteria that have been developed within the vascular practice or modified from standard published criteria should be internally validated where possible.

### **SECTION 4: SUMMARY**

Once the clinical indications for the examination have been elicited from the patient and the sonographer has addressed any questions or concerns raised by the patient, the examination can commence after informed consent has been obtained from the patient. A complete and thorough examination should be performed (using the guidelines above) and extended as necessary. Adequate, representative hard copy should be made of all aspects of the examination, including a written worksheet for the reporting physician.



Australasian Society for Ultrasound in Medicine  
PO Box 943, Crows Nest NSW 1585, Sydney AUSTRALIA  
Phone: +61 2 9438 2078 • Fax: +61 2 9438 3686  
Email: [asum@asum.com.au](mailto:asum@asum.com.au) • Website: <http://www.asum.com.au>  
ABN: 64 001 679 161