

Research Echo Vascular lab FMD protocol

EQUIPMENT

Echo machine (Vivid7) with vascular packages & probes
Table / armrest / stereotactic clamp / probe holder set-up
Automated blood pressure monitor & range appropriate-sized BP cuffs
Forearm pressure inflation BP cuff and manometer
Acquisition software
Matrox Meteor-II Frame Grabber
Vascular Imager (MIA Vascular Tools, Version 4.4.1)
Analysis software

FMD ACQUISITION

Lie subject supine for approximately 10 minutes with their head supported by a pillow
Explain the procedure to the subject, giving time to allow for questions

VIVID 7 set-up

Attach Echo machine ECG electrodes
Attach video cable from Vivid 7 “3-dot” video OUT on back of machine to Frame Grabber Video connector on computer
Open Vascular Imager on PC
For FMD set Vascular Imager to Timer mode, Speed (fps) to 0.33 and Frames to 220. This will automatically change seconds to 666.6 (11 minutes).
Vivid 7 has to be set on R wave trigger (Physio control). This allows only end-diastolic frames to be recorded to vascular imager.

Adjust bed height to table and position right arm on armrest, allowing arm & shoulder to rest comfortably and position stereotactic clamp in approximate position

Apply BP cuff to mid-forearm

Apply liberal ultrasound gel 5-10 cm above the antecubital fossa to create stand-off

Identify brachial artery with 2D & Colour Doppler if necessary, obtaining best horizontal longitudinal image, then fix probe using the stereotactic clamp and adjust gain, depth and contrast to optimise vessel walls and magnify image to optimal definition

Site Pulse Wave Doppler sample volume left, angle set at 60, optimise spectral display and set in split screen, ensure Doppler Scale set to 200cm/s

Ensure the subject is completely comfortable and emphasize the need for absolute stillness

FMD – Flow Mediated Dilatation (endothelium dependent) - 11 minutes

T-000 Start PC acquisition

Record 1 minute baseline

T-060 Inflate forearm pressure inflation BP cuff to 100mmHg above patients SBP.

Record for 5 minutes with cuff up and, 1 minute prior to cuff down again explain to subject the sensation they may experience and emphasize the need for absolute stillness

T-360 Deflate cuff quickly in <5 seconds

Record for further 5 minutes with cuff down, repositioning probe and adjust settings if necessary to re-optimize image

T-660 Stop PC acquisition