Antenatal Screening Wales Specification for Ultrasound Systems

This specification has been developed by Antenatal Screening Wales in collaboration with NHS Wales Shared Services Partnership **(**NWSSP-SES**).**
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This specification is relevant for ultrasound systems used for antenatal screening scans as defined in the Antenatal Screening Wales standards and protocols. In addition, this specification may be suitable for other obstetric scans but this must be assessed locally in each Health Board.
Ultrasound systems procured for Antenatal screening scans must be capable of producing images of high diagnostic quality and include, as a minimum, the following characteristics:

- Display/ screen size for sufficient clear visualisation
- Magnification facility
- Cine loop function
- Callipers that have a millimetre precision to one decimal point i.e. 0.1mm
- Adjustable signal processing facilities
- Tissue specific pre-sets for individual clinical applications
- Sector/ linear/ curvy-linear/ transvaginal probe relevant to gestational age
- Pulse, colour Doppler and tissue harmonic imaging

Details of minimum requirements

Clinical requirements

Clinical tasks:

Fetal measurements and visualisation of fetal anomaly as defined within the scope of the Antenatal Screening Wales standards and protocols.

Technical requirements

Please note – the system offered should meet the recommendations outlined in the Society and College of Radiographers publication 'Prevention of Work-Related Musculoskeletal Disorders in Sonography' (SCoR, 2007).

Physical and ergonomic features:

- A room – based wheeled unit
- Image display with the ultrasound image area no less than 12cm x 15cm with a matrix of 1280 x 1024 which will then have an effective pixel matrix size of no less than 1MP (megapixel) (see RCR guidelines)
- Variable position monitor (height, rotation and angle)
- Variable position central console (height, rotation and angle)
- Subdued and/or controllable console illuminations

Scan modes and or imaging features:

- B mode
- Tissue harmonic imaging
- Colour and power Doppler
- Multiple image display – facility to display at least two images in the same mode simultaneously
- Multiple mode display - simultaneous display of B and M mode, spectral, colour and power Doppler modes

Transducers:

- A range of transducers must be supplied to meet the clinical requirements relevant to the antenatal screening population.

Measurement / calculation tables:

- Multiple sets of pairs of '+' shaped callipers with a minimum precision of 0.1mm with continuous motion at all magnification levels
- Callipers of dynamically varying contrast compared to background
- Ellipse circumference measurement
- Measurement on frozen images
- Obstetric calculation and measurement package using Antenatal Screening Wales approved charts
- User definable tables

Controls and other features:

- Image freeze facility with playback of multiple last frames
- Read and write zoom on live and still images
- Cine- loop facility
- Footswitch
- Control of freeze, zoom, store and print with sufficient post processing to allow optimum visualisation for accuracy required for combined screening
- Automatic generation of measurement by the ultrasound machine must be disabled

Note – where air filters are fitted to the equipment these must be easily removable for cleaning and the frequency of cleaning and method of cleaning specified.

Image storage and output options:

- Network port with a minimum capability of 100mb
- Large capacity on-board image management system (storage >500 Gb)
- Thermal paper printer
- Confirmed Dicom compatibility for print, store, worklist, retrieve, display and presentation
- The machine must have the capability to re-measure images reviewed post examination.

Environmental/ room conditions:

- The machine must have the ability to be safely used and stored in locations with a minimum temperature of 21°C ±1°C

Safety and standards:

- Acoustic power outputs must meet national and international standards set down by AIUM/ NEMA ('acoustic output measurement standard for diagnostic ultrasound equipment') NEMA Standards Publication UD2-2004. Published by National Equipment Manufacturer's Association,1300 North 17th Street, Suite 1847, Rosslyn, Virginia 22209-3806 USA, www.nema.org
- Mechanical index (MI) and thermal index (TI) safety indices should be displayed on the image
- Manufacturer and user defined system presets must include an option for adjustable power output with the lowest output value set as the default
- Biological safety: details must be given of the recommended methods of cleaning and where applicable, sterilisation of all transducers and other parts of the system. A detailed protocol and list of approved cleaning materials should be provided.

Equipment replacement:

- Each Health Board should purchase equipment in line with the recommendations set out by the Royal College of Radiologists (2012)http://rcr.ac.uk/docs/radiology/pdf/BFCR(12)1_GoodPractice.pdf (see page 10) which states that ultrasound equipment should be replaced every 5 years.