The NIHR Southampton Biomedical Research Centre (BRC) has a tight quality assurance system for the writing, reviewing and updating of Standard Operating Procedures. As such, version-controlled and QA authorised Standard Operating Procedures are internal to the BRC.

The Standard Operating Procedure from which information in this document has been extracted, is a version controlled document, managed within a Quality Management System. However, extracts that document the technical aspects can be made more widely available. Standard Operating Procedures are more than a set of detailed instructions; they also provide a necessary record of their origination, amendment and usage within the setting in which they are used. They are an important component of any Quality Assurance Framework, but in themselves are insufficient and need to be used and interpreted with care.

Alongside the extracts from our Standard Operating Procedures, we have also made available here an example Standard Operating Procedure and a word version of a Standard Operating Procedure template. Using the example and the Standard Operating Procedure template, institutions can generate their own Standard Operating Procedures and customise them, in line with their own institutions.

Simply offering a list of instructions to follow does not assure that the user is able to generate a value that is either accurate or precise so here in the BRC we require that Standard Operating Procedures are accompanied by face-to-face training. This is provided by someone with a qualification in the area or by someone with extensive experience in making the measurements. Training is followed by a short competency assessment and performance is monitored and maintained using annual refresher sessions. If you require any extra information, clarification or are interested in attending a training session, please contact Dr Kesta Durkin (k.l.durkin@soton.ac.uk).

This document has been prepared from Version 1 of the BRC Standard Operating Procedure for performing DXA on adults. It was last reviewed in September 2015 and the next review date is set for September 2017. The version number only changes if any amendments are made when the document is reviewed.

NIHR Southampton Biomedical Research Centre

Procedure for PERFORMING ADULT DXA (Body Composition)

BACKGROUND

This procedure is to be used for Dual-energy X-ray Absorptiometry (DXA) scans. DXA scanning, also called bone density scanning, DEXA or bone densitometry, is an enhanced form of radiographic technology that is used to measure bone loss, bone mineral accrual and body composition. DXA is today's established standard for measuring bone mineral density (BMD). A radiograph is a painless medical test that helps physicians diagnose and treat medical conditions. In addition to assessment of BMD, DXA measures fat content and non-fat non-bone tissue. At the whole body site, this permits accurate assessment of body composition.

PURPOSE

To ensure patient safety and correct preparation and conduct for whole body DXA scanning of adults.

SCOPE

This procedure applies to any study involving whole body DXA scanning of adults within the BRC.

RESPONSIBILITIES

It is the responsibility of the measurer to read and follow this procedure when carrying out DXA scanning of adults within the BRC. It is the responsibility of the principle investigator to ensure that staff members who are working on specific studies have adequate experience and are competent to do so.

PROCEDURE

The system used is a Hologic Discovery DXA System, manufactured by Hologic Inc.. In the UK servicing, updates and repairs are supported by Vertec Ltd.

www.vertec.co.uk

Contraindications to scanning

- Pregnancy.
- Any investigation carried out in the last 10 days using a radioisotope, as these will affect the body composition results.
- Presence of internal metal artefacts, as these will affect the body composition results.

1. Ensure that the patient has removed all jewellery and is not wearing clothing with buckles, belts or metal fasteners.
2. Ensure that the patient is positioned to move to and from the table with the scan arm to the left (foot-end) of the table, for stability and access.
3. Ensure that the patient is lying on his/her back with their head at the right end of the table and that they are positioned within the scan limit borders marked on the mattress. The feet of taller patients may have to hang over the edge of the bed.
4. Ask the patient to place their arms by their sides with their palms facing downwards but not touching their thighs. This might be difficult to achieve in large/obese patients, in which case their arms should be by their sides with palms touching their thighs.
5. Ensure that the patient's feet are rotated slightly inwards, leaving a gap between the toes. If movement may be a problem, thin tape may be placed around the toes to support the legs in position.
6. Ask the patient to breathe normally and keep as still as they can.
7. Scanning is started in accordance with the operating procedure detailed in the Hologic Discovery Training Manual.
8. The operator should inform the patient that they need to keep as still as possible until the scan arm has completed 7 passes of their body. Explain that this should take approximately 7.5 minutes.
9. The DXA machine is operated using the settings and techniques described in the Hologic Discovery training Manual, which is stored in the scan room.
10. The scan is then analysed using the Whole Body Fan Beam analysis algorithm and the results are printed.

The equipment is calibrated with quality control checks using a spine phantom before every use by appropriately qualified and trained staff. In addition, a weekly step-wedge check is performed for system accuracy. The machine will not operate if these checks are not passed. The staff will use the equipment in accordance with specified guidelines produced by the manufacturer and will be qualified in radiation protection procedures.

Only the volunteers are exposed to ionising radiation (x-rays) during the procedure and the approximate radiation doses are recorded in the patient's hospital notes.