Standard Operating Procedure for use of flexible head-casts in MEG

Title:	Appropriate procedures and practices for use of flexible head-casts in MEG	Document source:	MEG Community website
SOP Version:	1	Last edited date:	19/11/2014
Prepared by:	Sofie Meyer and Benjamin Hunt	Approved by:	Gareth Barnes

General safety:

The flexible head-cast is designed to fit the subject's head internally and the MEG dewar externally. This means that the participant's head will be firmly fixed inside the dewar and any unexpected movement of the chair or MEG system has the potential to cause injury. To summarise this document:

NEVER MOVE THE MEG CHAIR OR DEWAR IF THE HEAD-CAST IS ON THE SUBJECT'S HEAD.

Purpose:

In order to ensure the comfort and safety of participants scanned while wearing head-casts, the outlined procedures are to be followed by all researchers for all MEG scans involving head-casts. If any additional concerns arise that would be appropriate to include here please send detailed descriptions to sofie.meyer.10@ucl.ac.uk for inclusion to future versions of this document.

Responsibilities:

Researcher(s): To complete the head-cast specific safety training and to know and follow the safety procedures described in this SOP. For the WTCN training programme, see Appendix I.
Chief Investigator: To ensure that all researchers have completed the head-cast specific safety training and that at least two researchers are present during scanning which only takes place during normal working hours when clinicians and support staff are on site.

Key warnings:

The dewar and chair (i.e. all moving parts) should remain locked in position whenever the subject is wearing the head-cast. This will minimize risk of neck damage.

The head-casts should only be used with healthy volunteer subjects and during normal hours.

The head-casts should only be used while subject is seated – **never use in supine position.**

Some subjects may find the head-localisation coils create pressure which could cause headache.

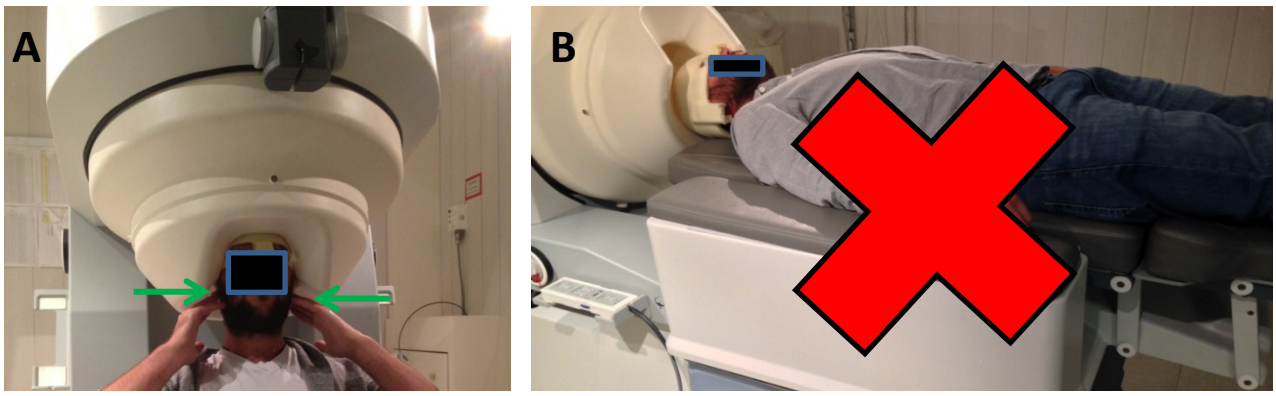

Fig. 2: A. To exit, press ear flaps inwards to reduce contact surface area between dewar and head-cast and slide out. B. Never use the head-cast in supine position. Subject is helpless if the bed is moved and severe neck damage can result.

Date:_____ Subject ID: _____ Log book number: _____

Researchers present: _____&_____

Researcher preparation:

- Researchers must know where the panic alarm for the room is located and what the relevant emergency phone numbers are.
- At least one researcher must be an MEG qualified user and head-cast safety trained while the other must, at minimum, be familiar with the safety documents and scanning procedure.
- On the subject's first visit, and generally recommended in case of panic attack / claustrophobia, confirm number and name of a clinician in the building _____.

Subject preparation (outside the scanner):

- Inform participant that they have the right to stop the scan at any time if they are uncomfortable with the equipment, procedure, or paradigm.
- Obtain written consent from participant.
- Confirm that the subject does not have any allergies to polyurethane foam products.
- Demonstrate how to put on the head-cast outside of the scanner.
- Allow participant to try wearing the head-cast outside of the scanner and ensure that it is comfortable. Cut out potential pressure points if needed.
- Fit the portable dewar template over the head-cast to give the participant an idea of what the head-cast will feel like within the scanner.
- Use talcum powder to minimize friction between the head-cast and interior of the dewar. Apply to surface of the head-cast (and re-apply during scanning breaks). To protect the participant's clothes from this, a gown is recommended.
- Participants should practice pressing in on the head-cast earflaps to exit the dewar template.
- Explain how the participant will sit in the scanning chair and be raised vertically into the dewar.
- Give participant the opportunity to ask any questions and raise any concerns before entering the shielded room.
- Verify that the subject does not display an allergic reaction to the head-cast.

Positioning the subject in the scanner (**without the head-cast**)

- Move chair to lowest level.
- Lock controls so chair cannot move forward or backward.
- Lock controls so chair back/seat angle cannot change.
- The chair must have a sheet or blanket to allow the participant to glide out of the chair.
- Elevate chair for normal MEG scanning. i.e. the top of the subject's head (without head-cast) is just touching the inside of the dewar.
- **Lock chair in position. Now all moving parts should be locked in position for the duration of the experiment.**
- Let the subject practise sliding in and out of dewar (without head-cast).
- Show participant the squeeze bulb or panic button and demonstrate sound before the scan.

Positioning subject in scanner with head-cast:

- **Ensure that chair and all moving MEG system parts are locked in position.**
- Now allow the subject to slide themselves into dewar wearing the head-cast.
- The participant should then practice exiting the dewar using the ear-flap method (figure 2A) before the experiment starts.

Scanning:

- Place MEG coils in the head-cast indentations.
- Participant re-enters the dewar (with head-cast) and the experiment can begin.
- **Ensure participant has a working squeeze bulb or panic button.**
- **The intercom system must be kept on 'listen' throughout experiment.**
- Participant is monitored via video-feed throughout the experiment by **_____(sign here)**

Should any unexpected source of discomfort or adverse effects arise, researchers should contact the clinician on call and do their best to ensure that participant is not in pain or danger as well as debrief them. Moreover, we ask that you report any such incidents (eg migrane onset, allergy to head-cast material, claustrophobia, withdrawal from study, etc) to sofie.meyer.10@ucl.ac.uk.
See Headcast Appendix I for training. Appendix II for emergency procedures.