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York NeuroImaging Centre

THE UNIVERSITY of York

Welcome to

Project Applications at

– **Preparing to scan at**

Scanning at

Analysis at

Leaving

York Neuroimaging Centre.

Workflow 3: Information for Investigators Preparing to Scan

Pre Scanning Steps

Finalising Stimuli

You should know how to use triggers and group codes. In MEG/MRI the data is usually recorded continuously. Therefore you need to know when a stimulus was presented and what was actually presented. Triggers in your stimulus presentation software tell you, and the scanner, when a specific stimulus was presented. Whereas group codes, which are optional, are used to provide extra information about which group of triggers the stimulus is affiliated to. The use of triggers allow you to relate the the timing of physiological responses in the brain to the onset of your stimuli. Different trigger/group code values can be assigned to different stimuli conditions for comparing condition in data analysis. Triggers/group codes are used as the basis for averaging your data later on. You should check that your triggers/group codes are working properly before the pilot scan.

You should use appropriate stimulus delivery software. As described above, trigger codes and group codes need to be integrated with your stimulus presentation software. At YNiC, the following software allows you to integrate the necessary triggers with your trials:

- E-Prime
  - Visual
- Presentation
  - Visual
  - Auditory
- Python in-house tools
  - pywavplay for simple auditory paradigms

Unfortunately, it is not the case that one stimulus presentation package suits all experimental paradigms. In general, we advise Presentation over over E-Prime; in particular, E-Prime is not well suited for auditory paradigms in imaging studies. However, should you only be using auditory stimuli in MEG, then the Python in-house tools are most suitable. If you are unsure about the most appropriate stimulus presentation software for you, you may want to raise your concerns at your Project Presentation.

You must book the scan rooms every time you want to use them. There may be times when you need to use MEG/MRI even when you are not scanning a participant e.g. using stimulus delivery software/hardware for checking triggers, setting up fMRI scanning paradigm etc. In these cases you must book MEG/MRI. Until your project is in the “Scan” state, all bookings must be made by contacting your SLO.

Preparing to Scan

It is advised that you book a pilot scan. A pilot scan is a practice scan that is supervised by the SLO for your project. The PI for the project should be present at the pilot scan. A pilot scan gives you the opportunity to check that your experiment will run smoothly and make any final changes that will improve your experimental paradigm. You may or may not want to use a participant. You may or may not include the data from the pilot scan in your final analyses. The pilot scan will give you a chance to check the timing of your experiment. This is important because you need to book the appropriate amount of time on the scanners for your experiment.

One/both of these forms need to be filled in before/during the pilot scan:

- https://www.ynic.york.ac.uk/forms/MEGsetup.doc

- https://www.ynic.york.ac.uk/forms/MRIsetup.doc

By the end of the supervised pilot acquisition, you need to have completed two copies of either the MEG Experimental Setup form, or the MRI Experimental Setup form (as appropriate). One form needs to be kept by one member of the project, the other will be kept in MEG / MRI.

You will notice that on these Experimental Setup forms there is a list of 'Approved Persons'. Anyone who is going to be running the experiment needs to have attended at least one 'supervised scan'. The supervised scan can either be a pilot scan where the SLO is present, or a scan that is attended by the approved Principal Investigator. This supervised scan is necessary to ensure that each approved person knows how to run their experimental stimuli. It also helps to ensure that any operator has the necessary information to perform the scan for any project, and that the operator knows the person who is running the experiment has received the appropriate training.

You should be aware that the YNiC operators (both MEG and MRI) are not responsible for the running of your stimulus program(s). The running of the experiment is the responsibility of the investigator(s) present. By the end of your pilot scan a final copy of your stimuli should be saved onto a USB stick (or equivalent) and in your group project folder. You need to be able to load this onto the stimulus computer and run the script yourself for each acquisition. It is your responsibility, not the operators, to run stimulus presentation scripts. Please be advised not to expect stimulus presentation scripts left on the stimulus delivery computers to be in the same state as you left them; either the stimuli may have been unintentionally modified by another User, or the computer itself may have been re-imaged.

To aid all Investigators, we have a checklist of advised practices. These following points should hopefully provide all the information for a trouble free imaging experience. By following these suggested practices, we feel that any Approved Person on any project would be capable of running an experiment with any operator.

Pre-scan checklist

You can advertise for participant volunteers in the YNiC volunteer pool. To advertise to the YNiC volunteer pool, you can use the `YNiC Database` program installed on all YNiC Open Plan machines. In this program, there is a `Email Pool` button which will allow you to send a request to participants. Please be aware that use of this service is monitored by YNiC staff.

You should know how to book scan time. In order to make bookings, you can either use the `YNiC Database` program on the machines within YNiC or use the web-based project tracking system. This can be found at https://www.ynic.york.ac.uk/pts and requires your normal YNiC username and password.

You should know how to register participants in the YNiC database. To register a participant into the YNiC database, you will have to get the participant to fill in this form; https://www.ynic.york.ac.uk/forms/ParticipantRegistration.doc and ensure that it is with reception 48 hours before the participant is due to be scanned. A participant only needs to be registered once, so you will only have to do this if it is the participant's first scan. Please note that under no circumstances should completed participant forms be sent via email.

Preparing a participant for scanning

It is important that your participants have received some level of preparation before they enter the scan suite. The Participant Preparation: RGC Requirements are the procedures that the RGC requires you to adhere to when scanning participants at YNiC. The Participant Preparation: YNiC Advice is a set of advised procedures which have proved over time to improve scan efficiency.

Participant Preparation Checklist: RGC Requirements

You should provide all relevant information to your participants prior to the scan. This is done by forwarding documentation to them *at least 24 hours* before the scan (YNiC Full Consent forms, MEG/MRI participant leaflets etc). An example email to send to participants is available here; https://www.ynic.york.ac.uk/forms/DraftParticipantEmail.doc. If your participant has not taken part in a neuroimaging experiment at YNiC before you should attach to this email the Full Consent Forms, the Participant Registration form, and the MRI and MEG Participant Leaflets. The Participant Registration form needs to be returned to YNiC at least 48 Hours before the scan (please remember that completed participant forms must not be sent via email). The Consent Forms should be filled in by the participant in advance, if they are a new participant, and brought with them on the day of the scan. If the participant has already taken part in an imaging study at YNiC their consent forms are kept in a locked filing cabinet in the Administration office. Ask a member of YNiC staff for access to filed consent forms. The MEG/MRI Participant Leaflets are simply for informational purposes.

You need to review the study-specific consent form with your participant. In addition to the YNiC consent forms, the RGC requires that you have a study-specific consent form. It is advised that your participant completes all forms at least 24 hours prior to the scan. On the day of the scan you should discuss all forms with your participant in the Interview Room before they enter the scan suite.

You need to review the YNiC Health and Safety and Consent forms with your participant. The YNiC Full Consent Forms, and are available here; https://www.ynic.york.ac.uk/forms/FullConsentForms.pdf. Forms must be reviewed for all participants even if they have participated regularly. This review should be completed with the participant in the Interview Room, before the participant gets changed. It is imperative that these are not completed in Reception or Open Plan; the Consent Forms contain sensitive information that must be discussed in a private environment. Although completion of the consent forms is ultimately the responsibility of the scanner operator, it is highly desirable that the experimenter has reviewed the forms before the participant enters the scan suite. By reviewing the forms in advance, should there be any questions about the scan, or reasons why the scan cannot commence, then these issues can be dealt without losing precious time in the scan-suite. This makes the best use of everyone's time.

You should explain to participants the importance of de-metalling. For both MRI and MEG scanning, participants must remove all ferromagnetic items. Should participants fail to do this there will be scan artefacts that may render the data useless. Moreover the participant could potentially be in danger. Typical items that need to be removed are highlighted in the Consent Form. To ensure participants have fully de-metalled, they are routinely asked to change into medical gowns. Note, some make-up contains ferromagnetic items, therefore you may wish to inform participants in advance that make-up also needs to be removed before scanning.

You should know the procedures for getting participants changed. Participants must get changed into medical gowns in the changing rooms, and must be in suitably attired when in reception. Even if a participant is willing to change in the scan-suite, or anywhere else, they should be instructed to change in the changing rooms. There are dressing gowns that participants may wear in between the changing room and the scan-suite. Similarly, female participants should be informed that they may wear a cotton t-shirt, or equivalent, underneath the medical gowns.

You are responsible for your participant's behaviour in YNiC. When you bring a participant, or anyone else, into YNiC you are responsible for their behaviour. YNiC is a clinical, as well as a research, facility. As such, your participant or guest must act in a manner appropriate for a clinical facility. In particular, please respect the fact the reception is a public space.

Participant Preparation Checklist: YNiC Advice

You should know how to book the interview room. The Interview Room may be booked by filling in your name and project number on the door.

You should prepare your participant for the experimental paradigm if necessary. Prior to the experimental scan, you can use the Interview Room to prepare the participant for your experimental paradigm. It is strongly advised that you do this in the Interview Room, rather the scan suite, so that you maximise your time and productivity in the scanner. Preparation may be in the form of either an information sheet, or practice trials on the Interview Room stimulus PC. The Interview Room may be booked by filling in the timetable on the Interview Room door.

You should know how much time in advance of the scan participants should arrive at YNiC (this is a minimum of 10 minutes). During the pilot scan it will be agreed how much in advance of the scan your subject needs to arrive. This will be different for each study depending on how much training participants need for the specific paradigm. The minimum time to complete the Consent forms and allow time for the participants to change is 10 minutes.