Before data acquisition -- Start MRI Project Spinoza REC

Version 2

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Abstract

Dear researcher,

This protocol gives you the steps to start an MRI project at the Spinoza Centre Roeterseiland.

If you haven't had contact with Steven Scholte or Tinka Beemsterboer, make sure to contact them before completing this protocol.

You can reach us by email:

Steven Scholte: h.s.scholte@uva.nl

Tinka Beemsterboer: t.beemsterboer@uva.nl

If you have any suggestions for improving the workflow, don't hesitate to add comments to the steps in the protocol.

Hope to see you soon!

Spinoza REC Team!

Steven Scholte, Tinka Beemsterboer en Lukas Snoek

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Protocol

Ethical Approval

Step 1.

The MRI project should been approved by an ethical committee before running the pilot.

Ethical approval may take some time, therefore it is the first step in this protocol.

External researchers starting a project at the 3T MRI scanner of the Spinoza Centre UvA REC, may also request EC approval using the Ethical Committee of Psychology of the UvA. Send an email to lab-fmg@uva.nl and t.beemsterboer@uva.nl to request an account for the website for requesting EC approval. Mention in your email that you want to request EC approval for a MRI project at the Spinoza Centre UvA REC, your name, university and department.

Go to the website https://www.lab.uva.nl/lab.
Click in the upper right corner on 'Onderzoeker'. Log in and follow the instructions.

Ethical Approval

Step 2.

In order to optain ethical approval you need to inform the Ethical Committee or Medical Ethical Committee about the screening procedure and procedure for incidental findings.

All subjects at the Spinoza REC need to fill out and sign the following:

- **screening** (English or Dutch)
- **GP information** (English or Dutch)
  You can find these in the Abstract (upper left corner).

All subjects at the Spinoza REC should be informed about the MRI procedure. The Abstract- tab contains the standard **information folder for MRI** (English and Dutch) research at the Spinoza Centre. You need to include this or a somewhat adapted version (depending on your project) to your Ethical Approval.

The Abstract contains a file explaining the **incidental findings procedure** one needs to follow at the Spinoza REC.

There is also a file explaining the MR screening, this is to help you understand the screening form but not something to include in your EC proposal.

User Agreement

Step 3.

The PI of the MRI project completes the User Agreement.

If we did not have contact yet about pricing etc., please contact Tinka Beemsterboer or Steven Scholte.

The budget holder of the project completes and signes the contract.

Before signing a contract, make sure to read the UserPolicy

Send the contract to t.beemsterboer@uva.nl.

Calpendo

Step 4.

Apply for a calpendo User Account.

The *PI and all other researchers, research assistants and interns* of the project should apply for a user account in Calpendo.

Go to the link https://spinozarec.calpendo.com.

Calpendo is the Calendar and user registration system used by Spinoza REC. Apart from booking registrations, Spinoza REC uses Calpendo to register Scan, Safety, Eyelink, EEG, GSR, EMG, fear conditioning and TMS certification, badges and BHV.

Calpendo

Step 5.

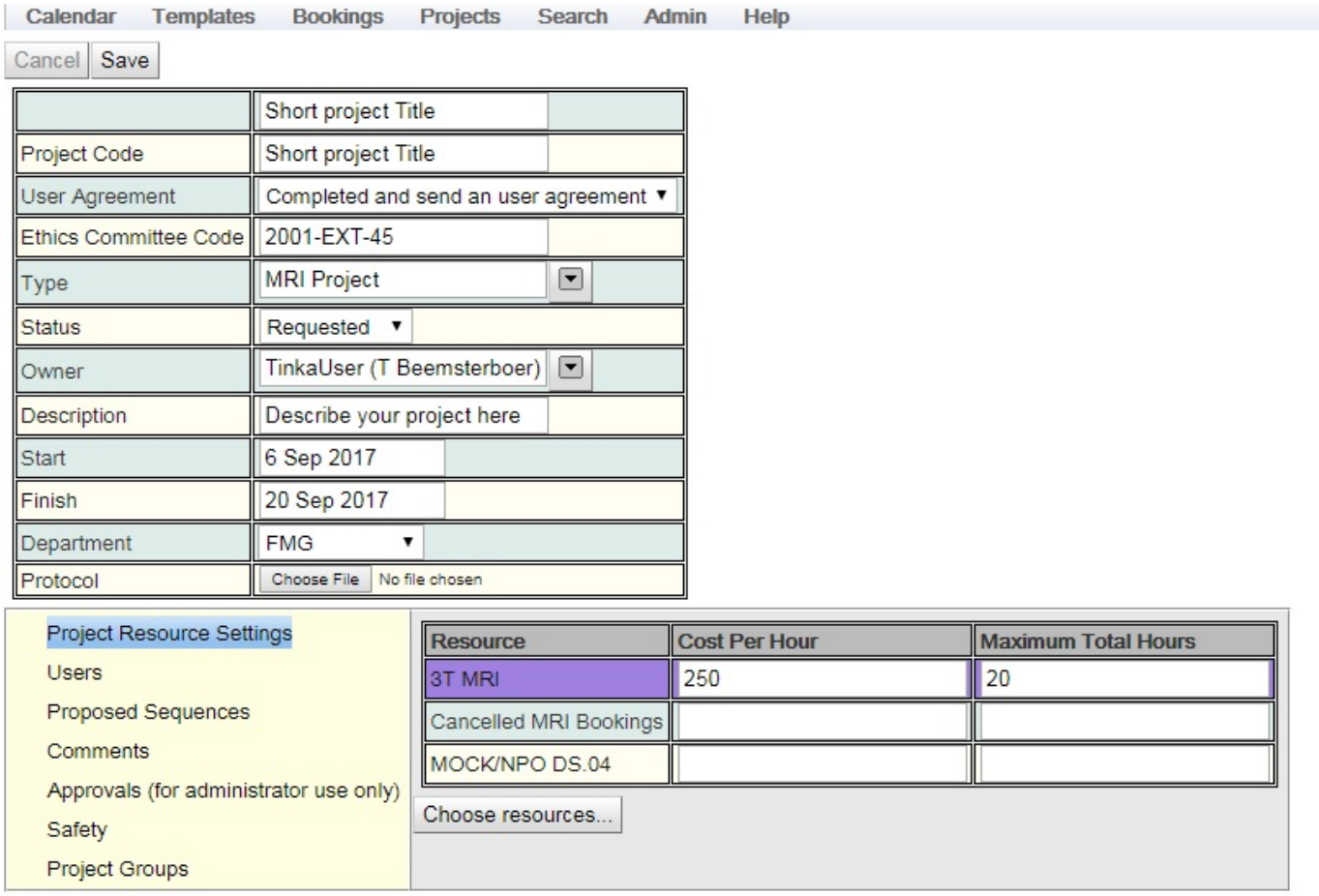
The PI of the project applies for a project in Calpendo.

After the user accounts have been approved, the PI of the project can apply for a project in Calpendo.

Please follow the following workflow to request the project:

- In Calpendo press Projects, **Create Project;**
- Choose for **Project Code** the unique short name for your experiment as specified in the contract;
- **Upload the protocol** as known by the Ethics Committee, at Protocol
- In **Project Resource settings** choose the Resources needed for the project.
  Include the number of hours per resource and the costs per hour for use of the MRI scanner as specified in the contract.
- **Users:** add all users of the project who have permission to manage MRI bookings for the project.
- **Safety:** set true at the stimulus equipment that will be used for the project.
  Note that the researcher of the project needs a certificate for using the Eyetracker, TMS, EGI and electrical stimulator.

For more information about certification on stimulus equipment, contact Tinka Beemsterboer.



Calpendo

Step 6.

Send an email to Tinka Beemsterboer (t.beemsterboer@uva.nl) once you have requested a project in Calpendo and mention which stimulus equipment (as described in the Safety tab) you intend to use.

MRI Data export

Step 7.

Apply for a storage folder.

In order to export MRI data from the scan computer, you need access to an 'fMRI Projects' (for researchers affiliated with the UvA FMG) or 'Dropbox' (external researchers) folder on our data-server.

Instructions:

- UvA FMG: requestfolderUvA
- External: requestfolderExt

How to access the dropbox FTP-server is explained here

Introduction Meeting

Step 8.

Schedula an introduction meeting.

Spinoza REC offers the possibility to have a meeting with Tinka Beemsterboer, Lukas Snoek and Steven Scholte to discuss the project. To set up a meeting, email Tinka Beemsterboer (t.beemsterboer@uva.nl).

Examples of what to discuss during the intro meeting

- Set up of scan sequences
- Set up of the experiment
- MR-course for the MR-operator
- Safety certification of assisting researchers
- Planning of the project
- Expectations and questions from both parties

We strongly advice to make use of this oppurtunity and prepare accordingly, because it is our experience that small details, which are easily overlooked, often result in failed pilots and the loss of scanning time.

Checklist before running the pilot

Step 9.

Schedule and prepare for running a pilot.

We strongly recommend running a pilot session with an experienced subject or one of the researchers involved with the project. In the next couple of sections, we'll outline a checklist with things to think about before running a pilot session.

Checklist before running the pilot

Step 10.

Make sure to have a working paradigm that waits for the first start pulse of the scanner

With each BOLD-MRI volume (excluding dummy scans), a trigger is sent to the stimulus computer. These enter the system as the letter **t** (a keyboard response). Make sure your paradigm doesn't start until it registers the first keyboard **t** response.

The following stimulus programs are installed on our stimulus-computer:

- Presentation (for which we offer technical support)
- E-Prime
- Matlab (Psychtoolbox)
- PsychoPy
- (For other programs, contact Tinka Beemsterboer for the possibilities)

The way to set up registration of external triggers in Presentation:

Select Use response button event:

Select Use fMRI (on the right side of buttons) after you selected the letter **t**:

If the setup was successful, you should see '**Keyboard: T**' at Button.

Checklist before running the pilot

Step 11.

Make sure your experiment interfaces properly with the response buttons of our button boxes.

Check the image below for the mapping of the buttons to the registered reponses on the stimulus-computer (e.g., a reponse with the left index finger of the left hand will be registered as a keyboard **e** response).

We also offer the use of the MRI compatible mouse and joystick. Let us know when you want to use these.

Checklist before running the pilot

Step 12.

Decide on the specific scan sequences that you want to run.

We advise you decide on which and how many sequences you want to run, including structural scans (T1-weighted), functional scans (EPI-based), diffusion-based (DWI) scans, and fieldmap scans (e.g., B0-based phase-difference fieldmap or "top-up"). Also, calculate the duration of the scans with regard to the duration of your paradigm/tasks.

If you intend to use other sequences than the basic sequences, let us know in time so we can set this up before the pilot (ideally, in the introduction meeting).

Checklist before running the pilot

Step 13.

Decide on whether to use additional stimulus equipment.

For example:

- Auditory stimuli;
- PPU (cardiac signal) and respiratory belt. This is free of charge and it is not necessary to book extra time for this;
- Eye tracker;
- EEG;
- Skin conductance;
- EMG;
- Electro-stimulator device (pain stimulation)

Ideally, mention if you plan on using extra stimulus equipment during the introduction meeting.

Checklist before running the pilot

Step 14.

Estimate the time needed for one participant.

Below you find an approximation of the scan time needed per participant depending on the stimulus setup; note that the duration of the scans should include communication to the participant, set up of

the scans, shimming and survey scan. Furthermore the time needed per participant is dependent on the type of participants and the experience of the researcher.

- Simple protocol, possibly including PPU and Resp: duration of the scans + 10 minutes.
- With GSR or EMG measurements: duration of the scans + 20 minutes.
- With eye tracker measurements: duration of the scans + 20 minutes

Of course, this estimation may be adjusted after the pilot or during your experiment.

During the pilot

Step 15.

Run your pilot.

During the pilot the researcher runs the task for the first time. Spinoza personnal will help you set up the sequences and assist you with the stimulus set up. Also we will try to help you with getting a good workflow for your scan time.

There are a couple of things that are generally done during a pilot:

- The researcher checks if the tasks are running properly and as expected;
- The researcher makes an estimation of the amount of time necessary to run one participant to eventually be able to make a feasible planning of the project;
- The MR-operator (from Spinoza REC) sets up a protocol on the scan computer;
- If desired, the person that is present from the Spinoza REC may advise you in aspects of the stimulus equipment, scan workflow and planning of the project

In our experience, it's best to use on the researchers involved in the project as a participant during the pilot.

Start your project!

Step 16.

Check your data after the pilot.

We advice you to check your data for artifacts or other issues after the pilot.

- Check whether you received the data files as expected (proper file format, right file size, etc.)
- Convert your scans from PAR/REC format to nifti and inspect your anatomical and functional scans visually (using e.g. FSLView)

In case of artifacts, let Lukas (L.Snoek@uva.nl) or Tinka know.

Start your project!

Step 17.

You're ready to start your project!

Now, you are ready to start your project by making bookings in Calpendo (spinozarec.calpendo.com)!

Good luck!