HCPh :: SOPs

The Axon Lab
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The Human Connectome PHantom (HCPh) study: Standard Operating Procedures

Figure 1. Experimental design of the Cohort I. The first section of the study involves the acquisition of 60 sessio

Summary

Unveiling how the brain's structure defines its distributed function and modulates the dynamics of processing holds the promise of triggering a revolution in neuroscience and applications to mental health and neurodegenerative diseases. Magnetic resonance imaging (MRI) has proven a valuable, non-invasive way of probing both the architecture and activity of the brain in-vivo, with sufficient spatial and temporal resolution to understand many aspects of its function. Although a large body of literature has shown strong correlations between structural and functional networks at the larger scales [1-4], the accumulated unreliability of MRI measurements from the scanner and through further steps of the research workflow impedes the link between structure, function, and dynamics at clinically relevant spatial and temporal scales. In particular, the measurements obtained with MRI are highly indirect, spatiotemporally uncertain, and are confounded by other sources of MR signal. This complexity provides an immense informatics challenge that crosses multiple imaging modalities, including structural, functional, and dynamic connectivity approaches to understanding the human brain. Nonetheless, functional and structural networks extracted from MRI have proven sufficient levels of reliability to discriminate between individuals [4-7], and such reliability has proven stable from months to years [8]. Therefore, it is critical to characterize the reliability of this network's phenotyping before these analytical approaches may be applied clinically [9, 10]. In this project, we will first optimize the research workflow of MR network analyses to maximize the reliability of functional and structural connectivity matrices (so-called connectomes). Indeed, these matrices have been shown to contain large ratios of false positives and false negatives in both the functional [11] and the structural [12, 13] cases. We hypothesize that such improvements in sensitivity and specificity of functional and structural networks generalize across scanners and subjects, allowing the univocal identification of individuals from their brain's networks ("fingerprinting"). In order to be able to statistically separate and characterize the sources of signal variation, the project involves acquiring large amounts of repeated data on a small number of individuals. This approach has recently been dubbed "precision MRI" [14] and focuses on individual differences rather than group differences. The data acquisition approach is structured in three efforts with varying numbers of subjects, repetitions, and scanning devices. The first two, called "Cohort I" and "Cohort II" are sequential in time, and collected on three different devices. Cohort I involves a single individual who will undergo a total of 60 scanning sessions. Subsequently, Cohort II involves six (6) individuals and a total of twelve (12) sessions each. Finally, "Cohort III" is a quality control set involving 18 individuals and a total of two sessions each in a single scanner. In total, the project plans for repeated MRI acquisition on 25 healthy, adult human subjects, across three different 3.0 Tesla (T) MRI scanners available at CHUV. In addition to the new data, the project will reuse existing, open-access data to pilot various aspects of the MRI processing and analysis workflow to further support the overall reliability of the findings.

Impact

Overall, this project will equip researchers with a framework for the extraction of reliable and precise structural, functional and dynamic networks that permit their joint modeling and analysis with interpretable and reproducible methods. The project will publicly release two highly valuable datasets necessary for the improvement of the workflow for structural and functional network extraction under open access and reuse terms. Upon conclusion, this study will mark a turning point for MRI research as a fundamental resource for academic training and a necessary assessment to unlock clinical applications in the long-term with the improvement of the reliability of MRI-network analyses. At a local scale, the project will substantially contribute to ensuring the reliability of the MRI clinical workflow that routinely aids medical decisions at CHUV.

Pre-registration

The experiments and hypotheses associated to the collection of Cohorts I and II will be pre-registered to further guarantee research rigour and seek early scrutiny and feedback from experts in the field, thereby generating consensus on data collection and analysis. Researchers increasingly perceive pre-registration as a tool to maximize research transparency, improve study planning, and eliminate incentives conducive to dubious practices in the search for positive outcomes. By pre-registering the study, we will maximize the impact and usefulness of this work. A report on the Cohort I collection is undergoing pre-registration. Similarly, a report on Cohort II will be similarly submitted to suitable journal or organization (such as the Peer Community in Registered Reports, PCIRR) for peer-review. Additional reports and public communications of results of this project will be pre-registered whenever that is possible.

References

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[14]: E. M. Gordon et al., “Precision Functional Mapping of Individual Human Brains,” Neuron, vol. 95, no. 4, pp. 791-807.e7, Aug. 2017, doi: 10.1016/j.neuron.2017.07.011.

Change History

Version	Date	Description / comments	By
22.0.0	2022-02-21	Initial draft	@oesteban

Recruitment, Scheduling, and Screening

Recruitment and screening

Cohort I

Recruitment, screening and informed consent do not apply to Cohort I because the participant is the Principal Investigator himself.

Cohort III

Recruitment, screening and informed consent do not apply to Cohort III because the sessions have already been acquired.

Recruitment shortlist

- [ ] Distribute the recruitment flyers at CHUV, as well as on EPFL and UNIL campuses, both physically and electronically (e.g., e-mail lists).
- [ ] Insert any new potential participant who shows interest by calling [redacted], whatsapp, SMS, email, etc. in our recruits spreadsheet *(/redacted.html)*. Make sure you get an e-mail contact to send documents.

Recruits shortlist

- [ ] Remove all flyers and indicate that recruitment is not open anymore once the shortlist quotas have been reached (5 males and 5 females for Cohort II).

First contact

Important

- [ ] Write an email to them within the next 24h
- [ ] Use the email template [WRITE BELOW] and make sure you attach the MRI Safety and Screening Questionnaire and the Informed Consent Form.
- [ ] Confirm the reception of the email AND the documents over the phone

Phone call

Info

The study coordinator ([redacted], Assistante doctorante) will call the potential participant after at least three days of having sent the information in the case of cohort II (HRA, art. 16-3; [15]).

- [ ] Use the phone script [WRITE!] to drive the conversation and record participant responses to questions.
- [ ] If participant consents to the phone screen, conduct it and mark the results (screener date, if responded "yes" to any medical questions, whether or not passed screener) in the appropriate columns of the recruitment spreadsheet.
- [ ] Confirm whether the potential participant understood the MRI Safety & Screening Questionnaire, and discuss with them any questions or potential reasons that may disqualify them to participate.

Carefully screen the subject

- [ ] In case of any doubts emerging from the MRI safety screening, indicate the potential participant that you will call them back within three days, after contacting the responsible physician.
- [ ] Collect as much information as possible about their case.
- [ ] Contact [redacted] with all the information.
- [ ] In case of negative assessment by the medical contact, the volunteer MUST NOT participate in the study.
- [ ] Otherwise, call back the participant as soon as possible to confirm participation.

- [ ] Female participants will be informed and must acknowledge that they must take a pregnancy test before the first scanning session.
- [ ] If the candidate participant does not pass the phone screen, then end the interview, informing them that they do not meet our inclusion criteria, and mark the screen fail in the recruitment spreadsheet.
- [ ] Make sure that the participant's questions about the study are all addressed and answered.
- [ ] Request the potential participant to confirm they are willing to continue.
    - [ ] Indicate in the shortlist of recruits that the participant is ready to schedule the first session.
    - [ ] Tell the participant that they will be called back to set up the first session.
    - [ ] Remind them that they can ask further questions at any time before the MRI scan session.

References

[15]: The Swiss Federal Council, Federal Act of 30 September 2011 on Research involving Human Beings (Human Research Act, HRA). 2011. Accessed: Nov. 29, 2021. [Online]. Available: https://www.fedlex.admin.ch/eli/cc/2013/642/en

Scheduling

- [ ] Iteratively draw participants from the recruitment shortlist and call them back to set their first session.

> **Stop calling potential participants when the sample size has been achieved**
>
> Once the sample size is filled (e.g., 3M/3F for Cohort II), call the remainder of the participants in the shortlist to let them know that they have been moved into the wait list.

- [ ] The first session will always happen at MRI 1 (Prisma^{Fit}, [redacted])

Scheduling of the Prisma^{Fit} system ([redacted])

> **Info**
>
> Contact [redacted], MRI Operational Manager, for any doubts/problems regarding this system

- [ ] Open the [redacted] scheduling system (URL *(/redacted.html)*) on a browser.
- [ ] With the participant on the phone, find a suitable, empty slot by scrolling the calendar.
- [ ] Click on the preferred slot, make sure that selected resource is [redacted]
- [ ] Select [redacted] in the Operator dropdown menu.
- [ ] Select the adequate length for the session (120 minutes)
- [ ] Select *Research on healthy subjects* in the Type of Scan box.
- [ ] Select *true* in Technician Required if you are not a certified operator of the system.

Scheduling of the Vida^{Fit} system ([redacted])

> **Info**
>
> Contact [redacted], Technical MRI Coordinator, for any doubts/problems regarding this system

- [ ] Open the [redacted] scheduling system (URL *(/redacted.html)*) on a browser.
- [ ] With the participant on the phone, find a suitable, empty slot by scrolling the calendar.

> **Clinical scanner hours are very restricted**
>
> The study can only be executed on Fridays after 18h00

- [ ] Click on the preferred slot, make sure that selected resource is [redacted]

- [ ] Select [redacted] in the Operator dropdown menu.
- [ ] Select the adequate length for the session (60 minutes)
- [ ] Select *Research on healthy subjects* in the Type of Scan box.
- [ ] Select *true* in Technician Required.

Scheduling of the Vida system ([redacted])

Danger

Only [redacted], Technical MRI Coordinator, can book this system.

Data collection

Preliminary work

Preliminary work

Once, at the beginning of the project

- [ ] Prepare a laptop with a running Psychopy 3 installation AND the EyeTracker software. For these SOPs, the designated laptop for the experiments is [redacted].
- [ ] Fork the HCPh-fMRI-tasks repository *(https://github.com/TheAxonLab/HCPh-fMRI-tasks/fork)* under your user on GitHub.
- [ ] Clone the HCPh-fMRI-tasks repository *(https://github.com/TheAxonLab/HCPh-fMRI-tasks)*:

```
git clone git@github.com:<your-gh-username>/HCPh-fMRI-tasks.gi
```

- [ ] Set-up the original repository as upstream remote:

```
git remote add upstream git@github.com:theaxonlab/HCPh-fMRI-ta
```

- [ ] Watch the gas analyzer (GA) video: https://mkpdfs.comwes.euhttps://embed-ssl.wistia.com/deliveries/5e08ccab25ab45382329671a82dfe5123f6e840e/file.mp4 Your browser does not support the video. Click here to download it

Set up the scanner protocol at the MR console

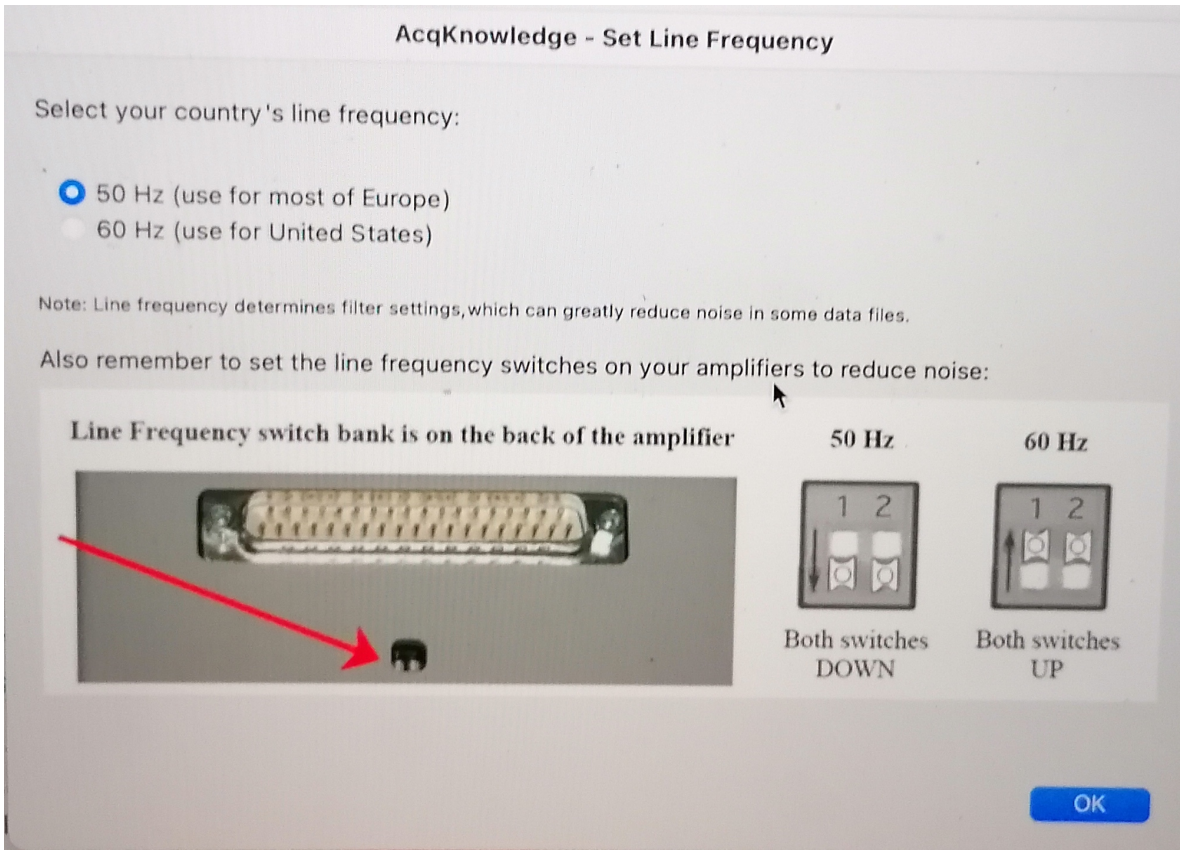
> **Important: follow Reproin conventions**
>
> When assigning names to the MR sequences in the protocol, make sure to follow the Reproin conventions *(https://dbic-handbook.readthedocs.io/en/latest/mri/reproin.html)* to maximally facilitate the conversion into BIDS.

- [ ] Once the protocol is decided upon, and after any updates, make sure of storing the protocol:
  - [ ] Select all the sequences in the sequence list and click right to copy.
  - [ ] Open the Dot-Cockpit
  - [ ] In `Browse`, find the right folder to save the protocol in (RESEARCH > Oscar).
  - [ ] Right click on the folder and select `New program`.
  - [ ] Paste the copied sequences in the empty program [INSERT PICTURE].
  - [ ] If desired, the protocol details can also be downloaded as a pdf on a peripherical USB key.
    - [ ] Click right on the protocol and select `Print`
    - [ ] Save the PDF in your USB key.

- [ ] Repeat the operation after creating the four variants of the protocol, one per PE direction.

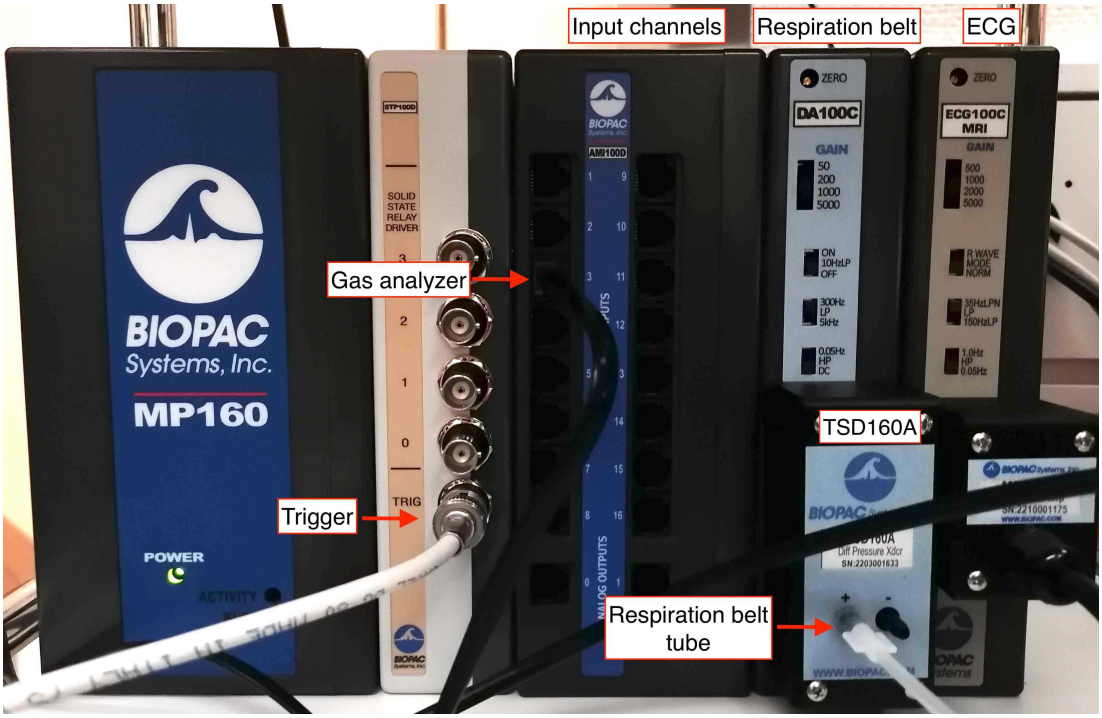
Install the BIOPAC

- [ ] Set up the line frequency switches on the back of the BIOPAC amplifier depending on your country frequency to reduce noise. Both switches should be DOWN if your country's line frequency is 50Hz. Both switches should be UP if your country's line frequency line is 60Hz.



- [ ] Plug the different units of the BIOPAC together if it has not been done yet.

- [ ] Get familiar with the BIOPAC system:
  - [ ] We use the BIOPAC to synchronize and output in a single file all the physiological recordings: cardiac pulsation, respiration and CO_2 concentration.



  - [ ] The AMI100C unit can receive up to 16 analog signals.
  - [ ] The DA100C unit records the signal coming from the respiration belt. Plug the TSD160A unit on the DA100C.
  - [ ] The ECG100C MRI unit records the electrical signal coming from the heart via the ECG. Plug the MECMRI-2 unit on the ECG100C unit.
  - [ ] The SPT100 (solid state relay driver unit) is used to record triggers. A trigger appears as a vertical red line on your physiological recordings [INCLUDE IMAGE]. Plug the trigger to the TRIG entrance.
- [ ] Install the BIOPAC recording software AcqKnowledge.

Every two months - calibrate the GA

- [ ] Get a gas bottle with a known CO_2 concentration between 5% and 10%.
- [ ] Connect the GA to the BIOPAC as described below and start recording signal.
- [ ] Edit the configuration of the inputs, making sure you update the voltage range for input 3 (the GA), estimated as described in the GA's manual

Three days BEFORE THE FIRST SESSION

- [ ] Verify that as part of the recruitement and screening procedure, you have sent a copy of the MRI Safety and screening form (EN|FR) to the participant over email and confirm reception by checking the 'First contact email sent' column in our recruits spreadsheet *(/redacted.html)*.
- [ ] Verify also that you confirmed that the participant has read and understood the document, and in particular, you double-checked that they do not have any MRI contraindications, by

checking the 'Phone interview done' and 'Participant volunteer and eligible' column in our recruits spreadsheet *(/redacted.html)*.

- [ ] If the phone call interview was more than three days before the first session, call the participant again to reconfirm the following informations:
  - [ ] Remind the participant that any jewelry should be removed prior to the scan.
  - [ ] Indicate that they MUST shave the upper area of their chest where the ECG electrodes will be placed, if there is hair. The ECG electrodes MUST directly contact the skin.
  - [ ] Confirm clothing:
    - [ ] if allowed to wear street clothes, remind the participant to avoid clothing with metal or that would uncomfortable to lie in for the duration of the scan; otherwise
    - [ ] remark the participant they will be given a gown and they will need to change before every session.
  - [ ] Repeat at what time and where will you meet the participant.
  - [ ] Verify that the participant has your phone number [redacted] to call you in case he gets lost.
- [ ] If participant has indicated nervousness or history of claustrophobia, organize a session to use the mock scanner.

BEFORE DAY OF SCAN

- [ ] Print the informed consent form (first session only), an MRI safety screener (EN|FR) and a receipt form for each participant that will get scanned.
- [ ] Make sure you have internet access, and update the HCPh-fMRI-tasks repository *(https://github.com/TheAxonLab/HCPh-fMRI-tasks)* on [redacted]:

```
git fetch upstream
git checkout main
git rebase upstream/main
```

- [ ] On the [redacted] laptop, open a terminal and execute `conda deactivate`.
- [ ] Open psychopy 3 by typing `psychopy`
- [ ] Load in the different experiments and check for proper functioning:
  - [ ] Resting-state fMRI (RSfMRI): open the file `resting_state.psyexp` and check that the movie is played.
  - [ ] Breath-holding task (BHT): open the file `breath_holding_task.psyexp` and check it properly runs, while timing it (total length should be 5 min 24 s).
  - [ ] Positive-control task (PCT): open the file `control_task.psyexp` and check it properly runs, while timing it (total length should be 2 min XX s)

Before each session

> **Thanks**
>
> All the documentation about the eye-tracker is derived from Benedetta Franceschiello's user guide. We greatly appreciate her help with the eye-tracker.

Instructions of operations to be performed before the participant arrival, before EACH session (i.e., DAY OF SCAN)

Documentation and other non-experimental devices

- [ ] Prepare the informed consent form (first session only)
- [ ] Prepare an MRI safety screener (EN|FR)
- [ ] Prepare a pen and a receipt form that the participant will sign when they are given the compensation.
- [ ] Check you have the AcqKnowledge software USB license key.
- [ ] Prepare a pregnancy test (Only female participants on their first session)
- [ ] Prepare a thermometer.
- [ ] Prepare a blood pressure meter.
- [ ] Prepare scrubs and MR-compatible glasses if applicable
- [ ] Verify that your phone is on ringing mode so the participants can reach you.
- [ ] Check the time regularly to be on time to meet with the participant at the predefined location.

Boot the scanner up if it is shut down

> **It is critical to wait for all systems to finalize their boot-up (about 10 minutes). This is also necessary even if only the satellite station is to be used.**

- [ ] Turn the key of the System ON/OFF Station Box into the *open lock* position (🔓)
- [ ] Push the blue button with the sun symbol (☉) and the SYSTEM ON label underneath, which is found right above the key

Basic preparations in the scanning room

- [ ] Remove the head coil that is currently installed.
  - [ ] If it is the 64-channel, you can just temporarily move it into the scanner's bore.
  - [ ] Otherwise, store it on the shelf where the other coils are and bring the 64-channel one in the proximity of the bed (e.g., inside the scanner's bore). Make sure to remove other coil's fitting element.
- [ ] Remove the spine coil by lifting the corresponding latch, then sliding it toward the head of the bed, lift it from the bed, and place it on the floor ensuring it is not obstructing any passage or unstable.
- [ ] Place the two back padding elements filling the spine coil socket.
- [ ] Cover the MRI bed with a sheet.
- [ ] Fix the 64-channel head-and-neck coil onto the head end of the bed and connect the coil's terminal cable. Check that the head-and-neck coils are now detected by the scanner, that is the name of the coils (here "Head Neck 64 Anterior" and "Head Neck 64 Posterior") appear on the scanner's monitor screen.

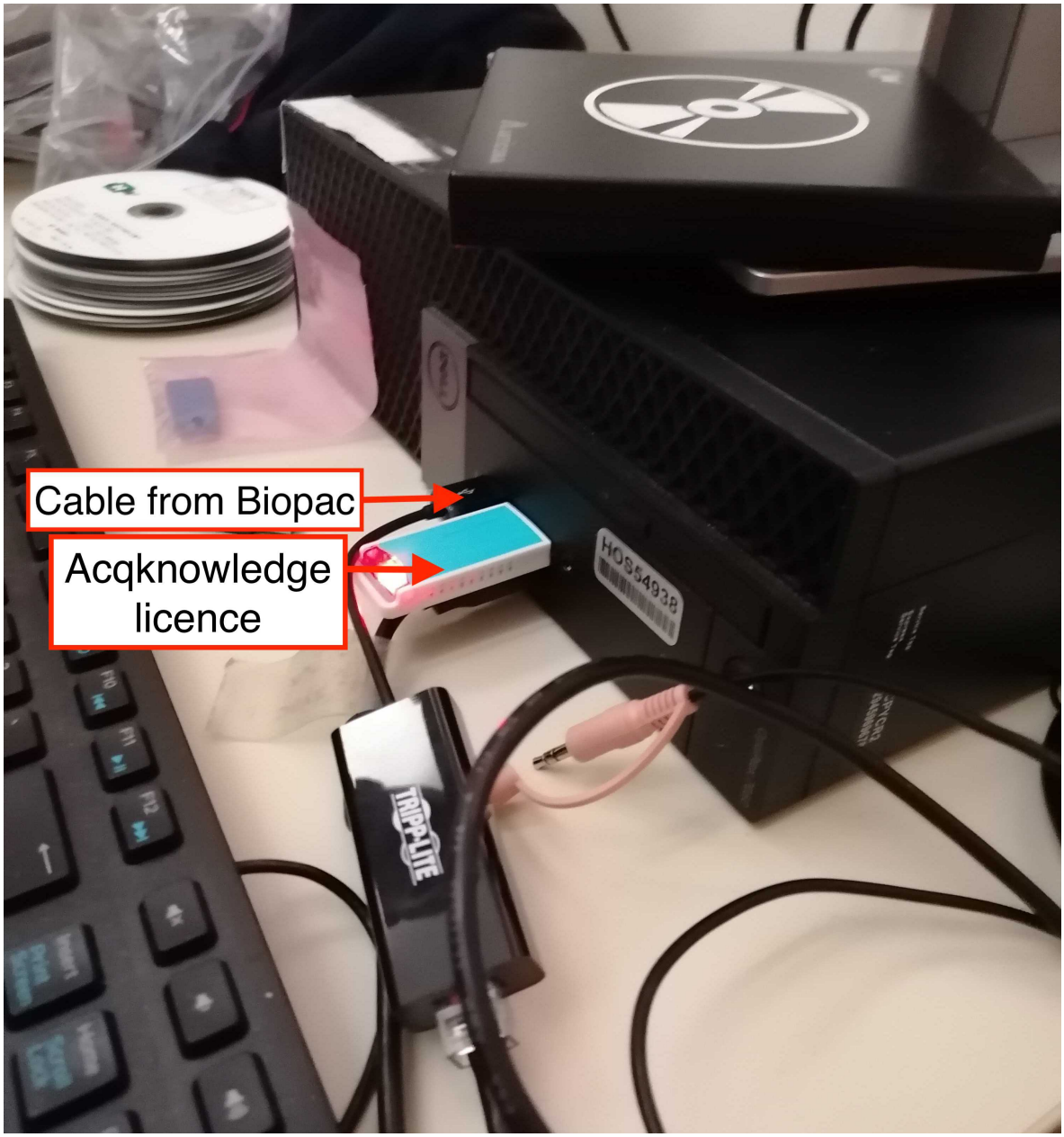
- [ ] For the ET, you should remove the light inside the scanner bore (4) and the ventilation (5). Button 2 and 3 are used to set the volume of the speakers in the scanner room and volume

in the earphones respectively. By clicking on the central knob (1), you can turn off the alarm if necessary.

- [ ] Press the respective button and rotate the central knob.

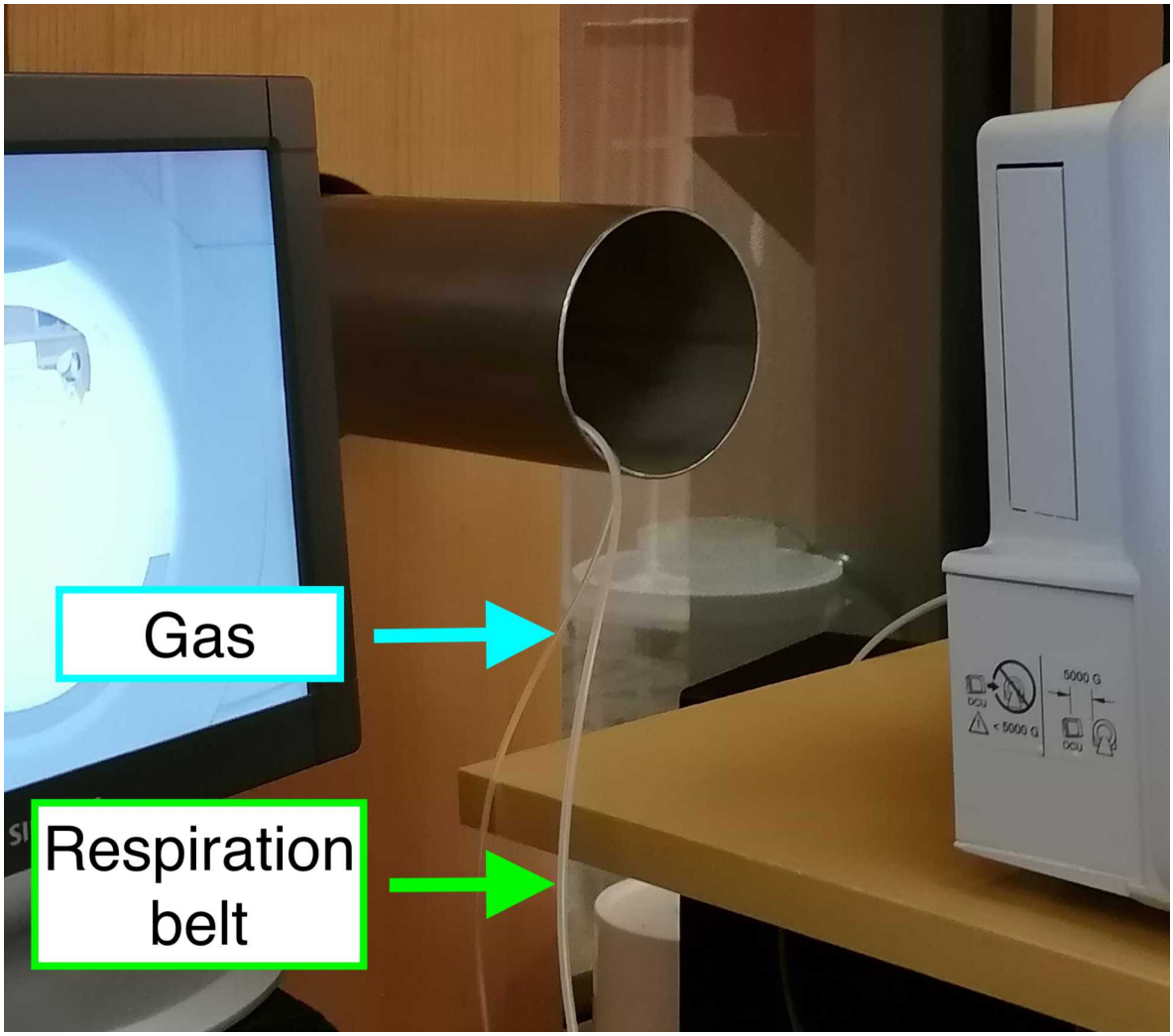
Setting up the BIOPAC system and physiological recording sensors

- [ ] Ensure you have the AcqKnowledge software USB license key.
  - [ ] Plug the USB key to the computer [redacted]. It needs to stay plugged at all times during the acquisition as shown in the picture below.
- [ ] Plug the power cord of the BIOPAC and of the GA into suitable power sockets.
- [ ] Plug in the Ethernet (the plug is on the back side) to one USB input of [redacted], using the Ethernet-to-USB adaptor [INSERT PICTURE].



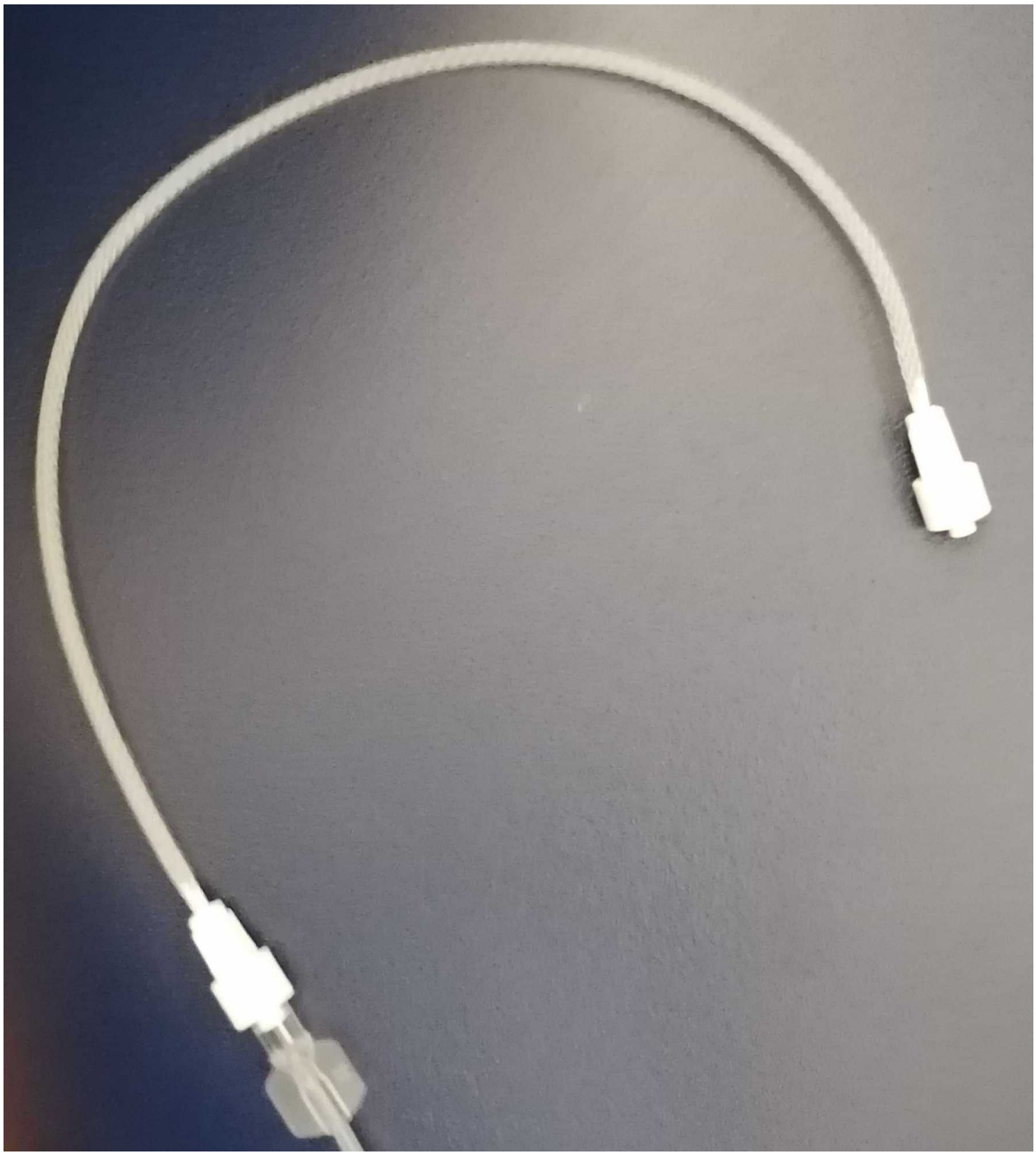
- [ ] Go inside the scanning room, unscrew the wood cap that covers the hole in front of the MR.
- [ ] Check that the extension tube for the nasal cannula does not contain any bubbles.

- [ ] Delicately pass the extension tube that will be connected to the nasal cannula and the extension tube from the respiration-belt (RB) through the front access tube.



- [ ] Connect the distal end of the extension tube to the cannula via a MLA0343 drying tube and/ or the desiccant chamber (?) and leave the cannula ready on the bed ready for the participant. If the color of the drying tube changed, it should be replaced. You should keep enough extension tube inside the MR room so that it can lie on the floor. It is important that both the GA and the RB tubes lay on the floor as much as possible to avoid waves shaking

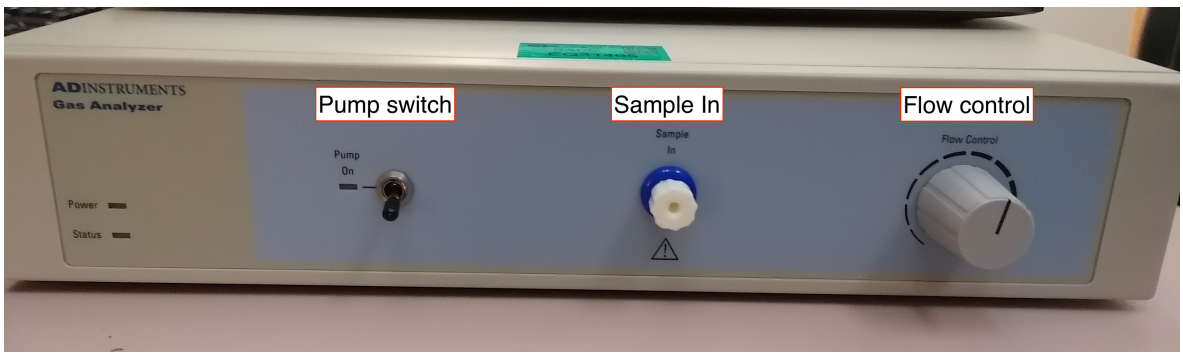
the tubes.



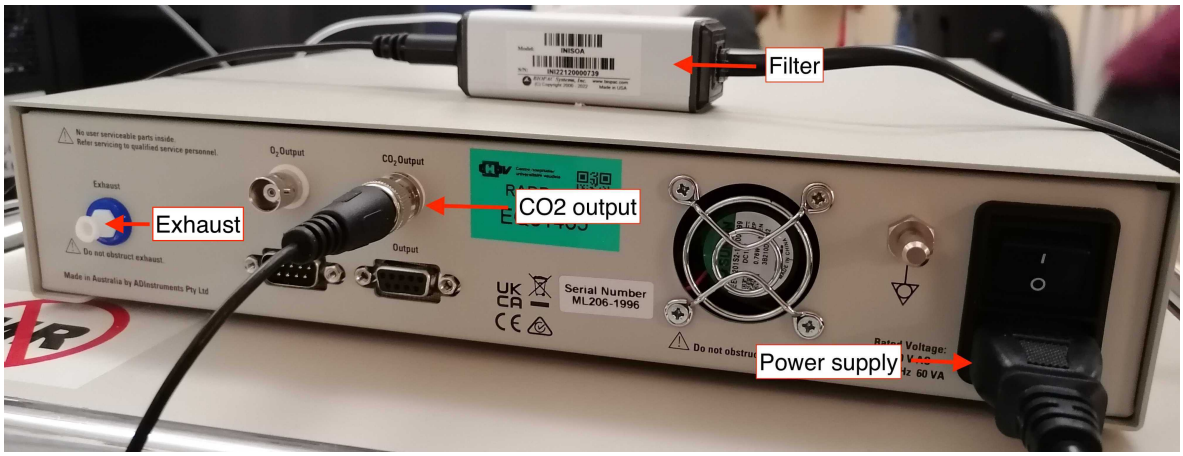
- [ ] Connect the distal end of the RB tube to the RB and leave it on the bed.

- [ ] Go back to the control room and connect the proximal end of the cannula extension tube to a MLA0110 inline filter.

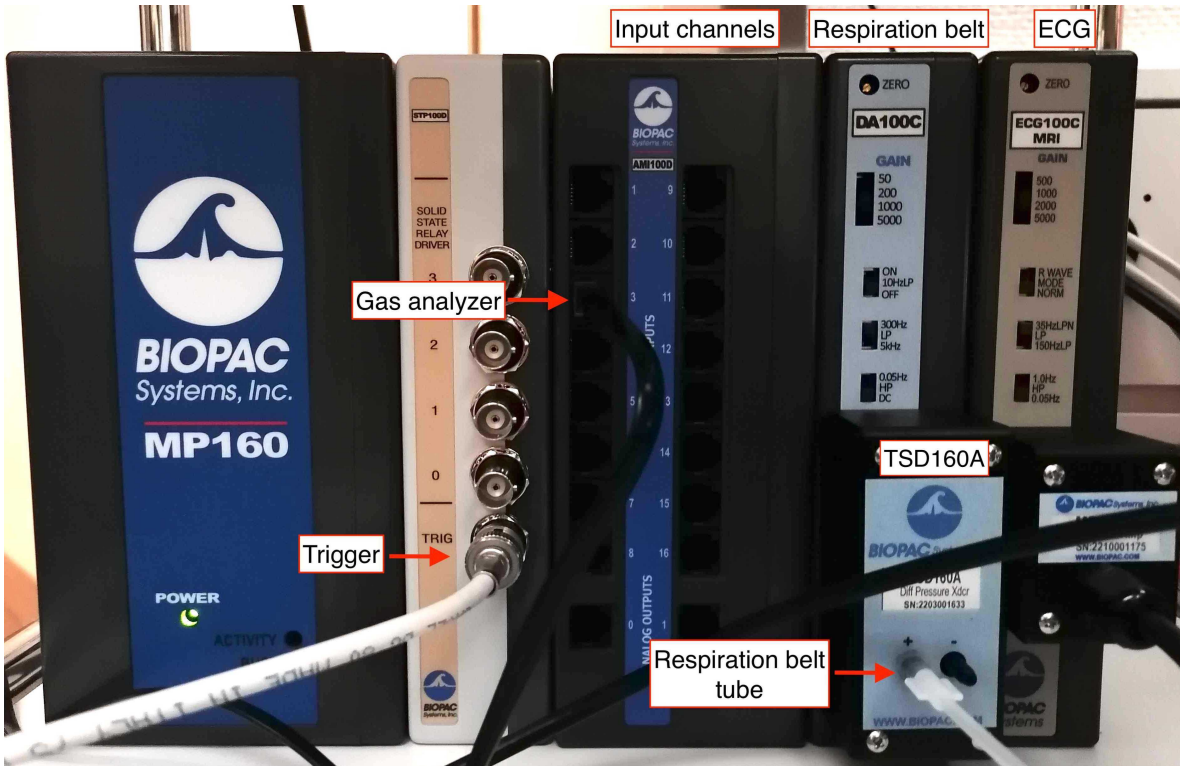
- [ ] Remove the cap of the gas input (Sample In, front panel of the GA) and connect the MLA0110 inline filter to it. The inline filter MUST be replaced after some ten sessions.



☐ Connect the coaxial end of the BNC-BNC cable to the CO_2 output in the back of the GA and connect the other end (jack plug) into the input end of the INISO/A filter.



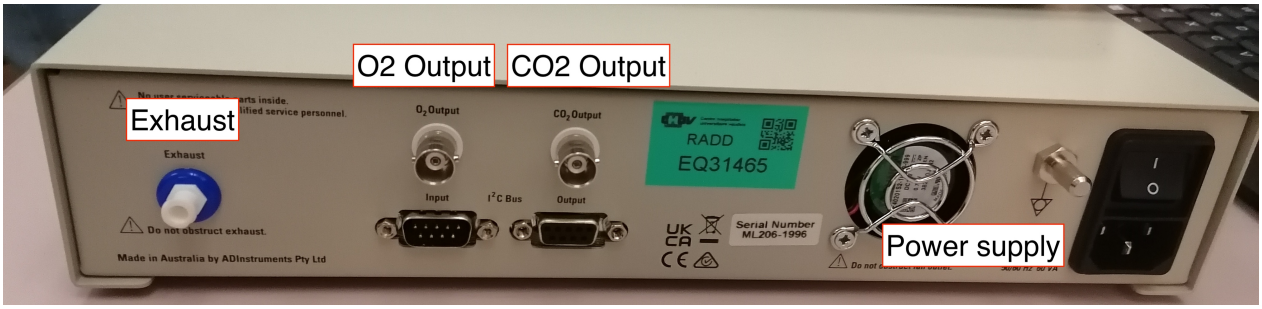
☐ Connect one end (RJ-11 to RJ-11) to the output of the INISO/A filter, and the other into channel 3 of the AMI100D BIOPAC module.



- [ ] Check that the RB (DA100C) and ECG (ECG100C MRI) channels are set to channel 1 and channel 2.

Important

- [ ] Check that the exhaust pipe (back of the GA) is free of obstruction. An obstructed exhaust can damage the device!



- [ ] Check that the cap on `Sample In` is removed and that the MLA0110 inline filter is connected to it. The pump switch MUST BE OFF when the cap is on and when switching on the GA. Turn the GA on using the on/off switch located at the front of the GA. The GA MUST be ON for 20-30 min to warm-up before measuring.

- [ ] Check that the flow control wheel (front of the GA) is set to the maximum. - [ ] Connect the proximal end of the RB tube to the TSD160A BIOPAC unit, using the plug marked negative (-symbol). - [ ] Connect the cable from the RJ-45 output of the syncbox to the first filter (BNC connector; has a label "External signal") in the cupboard covering the access panel to the Faraday cage. The cable might be stored in the lower left cupboard of office [redacted]. Make sure you will have access to the cable with sufficient time ahead. [INSERT PICTURE] - [ ] Connect the syncbox to the Biopac via the white trigger cable. [TOCHECK]

Setting up the eye-tracker

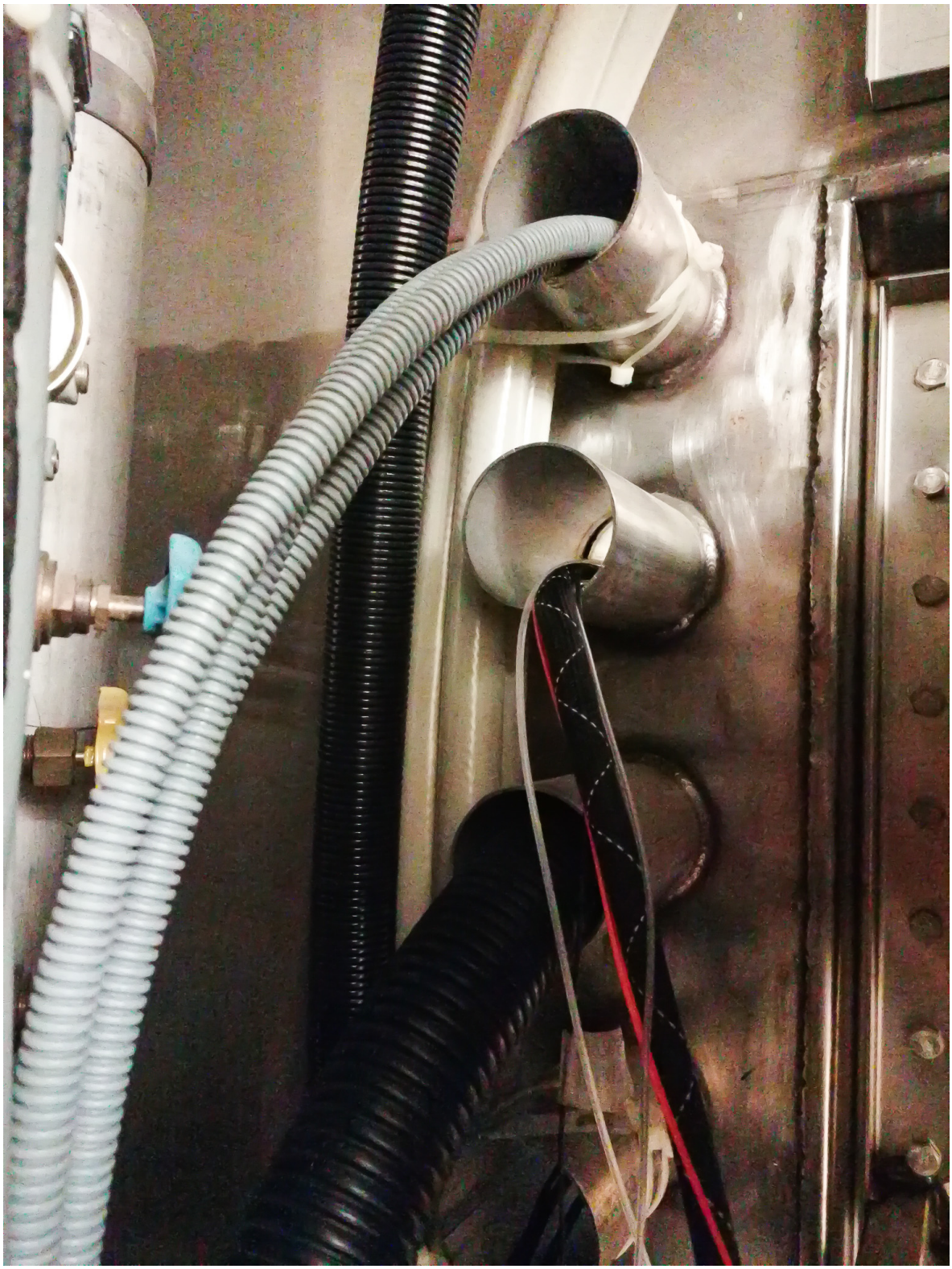
- [ ] The eye-tracker (ET) computer is kept on its designated rolling table, which is stored under the projector in room [redacted]. Behind the rolling table, there is a transparent panel (the *plexiglas* in the following) where the ET camera will stand inside the scanner bore.
- [ ] Verify that the monitor and the cable, as well as the ET over the PC tower are fixed to the rolling table with scotch tape.
- [ ] Bring the table with the ET computer to the control room, and place it next to the access closet. Be very attentive during the displacement and lift the front wheels when passing steps or cables. The plexiglas panel can also be brought to the scanning room simultaneously, if done with care.
- [ ] From room [redacted] (first cabinet on the left), take the blue box labeled *Eye-Tracker only for fMRI*, containing the ET camera, lenses, and the special infrared mirror.
- [ ] Take the MR-compatible lens out of the lenses box. It is easy to recognize it as it is the only one with two golden screws.

- [ ] Install the MR-compatible lens, after removing any other present lens. If other lens is present, put it back to its plastic bag inside the lenses box after unscrewing and removal. To avoid accidentally dropping a lens, one hand MUST be under the lens at all times while screwing/unscrewing it. The lens MUST BE INSTALLED before bringing the ET inside the Scanner Room.

INSIDE the scanner room

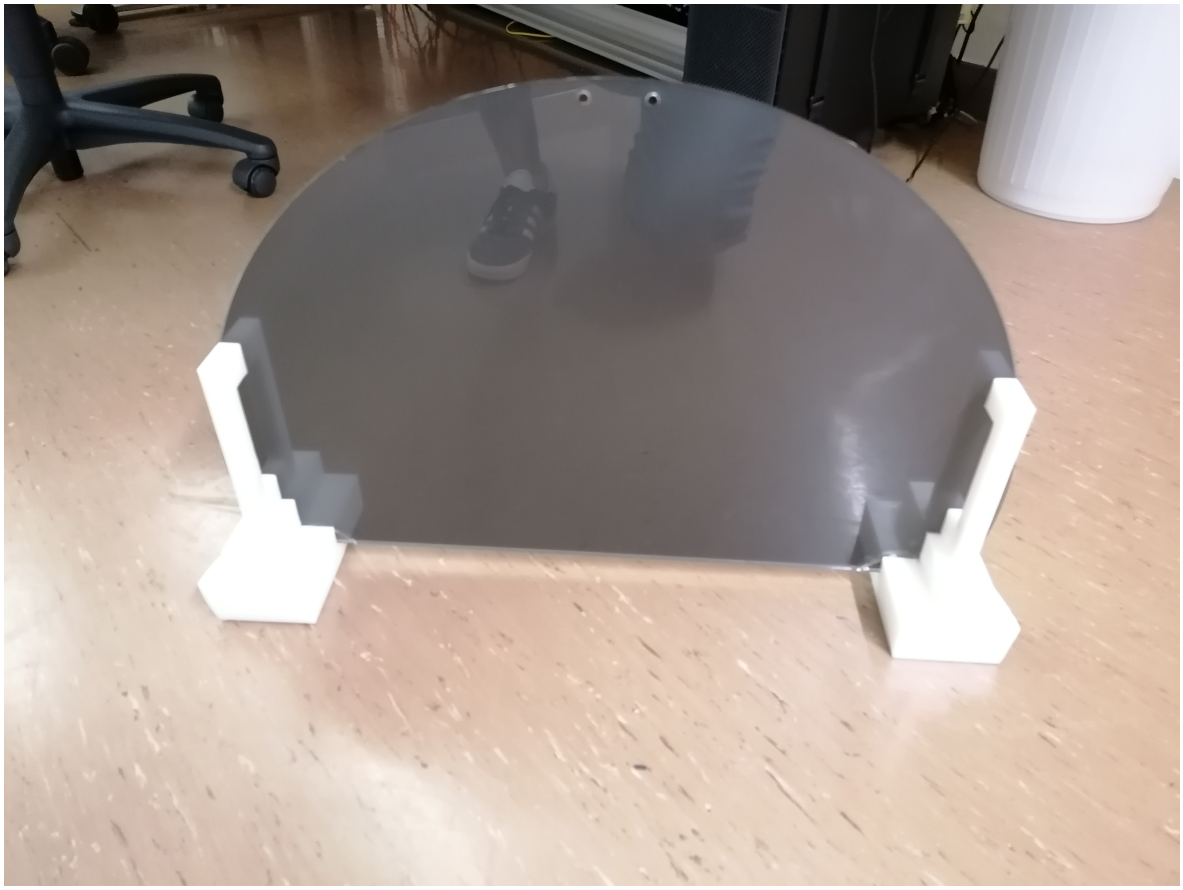
- [ ] Place the plexiglas standing panel inside the scanner bore, following the indications stuck on the panel (a sign notes the top side that faces up, and to tape markers designate the position of the ET). The plastic feet must face down to avoid the panel to slide. DON'T PUSH IT inside, it MUST be adjusted once the participant is placed inside the scanner to ensure the repeatible positioning of the ET.
- [ ] Bring the ET inside the scanner room, and put it on top of the plexiglas panel. The two posterior feet of the ET stand have to be within the two corner signs made of scotch tape. HOLD THE ET STAND STRONGLY, BECAUSE THE MAGNETIC FIELD GENERATES RESISTANCES.
- [ ] Open the door of the cable section between the recording room and the scanner room.
- [ ] First, pass the optic fiber (orange wire) and the power cable (the one with a fabric sheet) through the access point. This operation requires two people, one handling the cables from outside the scanner, and the other gently pulling them from inside. Both people will lift the cable to avoid its abrasion with the edges of the metallic cylinder, which is the passage between exterior and interior of the scanner room. Once the sliding of the cable is finished, leave the extremities inside the scanner room in the left-top corner, far from the scanner.

These parts are magnetic.



- [ ] Connect the cables (two plugs for the black, one plug for the orange).

- [ ] Take the half-circle one-direction screen from the table behind the scanner and put it on the back of the scanner, behind the ET system (don't push the plexiglas yet)



- [ ] Place the infrared mirror:
    - [ ] Detach the mirror frame from the head coil, if it is placed there. Remove unnecessary items from the scanning bed, and prepare the mirror to attach the infrared mirror of the ET at a later step.
    - [ ] Prepare two long strips of scotch tape and leave them in a convenient place to attach the ET mirror later. E.g., attach the corner of each strip to the back part of the mirror frame.
    - [ ] Go back to the control room and take the infrared mirror out of the «fMRI usage» box. DO NOT EXTRACT THE MIRROR OUT FROM ITS BOX YET. The mirror's box is labeled as *RELIQUIA DI SAN GENNARO (https://it.wikipedia.org/wiki/San_Gennaro#La_reliquia)* to emphasize that THIS IS THE MOST DELICATE PART, BECAUSE THE MIRROR CANNOT BE REPLACED NOR CLEANED. This mirror is EXTREMELY EXPENSIVE.

- [ ] Get two gloves (e.g., from the box hanging at the entrance of the scanner room), then approach the scanner bed. Put the gloves on, and DON'T TOUCH ANYTHING. You MUST have the standard mirror dismounted and in front of you at this point. WITH THE GLOVES proceed to extract the infra-red mirror from its box, being extremely careful. YOU CAN ONLY TOUCH THE MIRROR WITH GLOVES, because it cannot be cleaned up. Watch out for FINGERPRINTS and once taken out of its box, IMMEDIATELY PROCEED TO ATTACH IT to the standard coil mirror. The mirror MUST NOT be placed anywhere else if not in its box.

- [ ] WITH YOUR GLOVES ON, attach the ET mirror to the standard coil mirror (the larger mirror that points toward projector's screen at the back of the scanning room) using the scotch tape strips you prepared before. Put it more or less in the center, although this position may need to be adjusted (being careful and with the same precautions explained before). Do not touch the surface of the ET mirror.
- [ ] Place the mirror frame back on the head coil. As always, DO NOT TOUCH THE MIRROR.

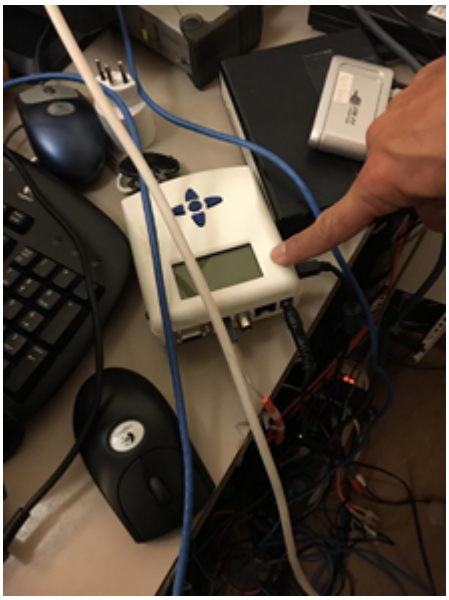
Back OUTSIDE THE SCANNER ROOM (control room)

- [ ] Connect the Power cable to the metallic extremity belonging to the PC-tower connect-power-cable

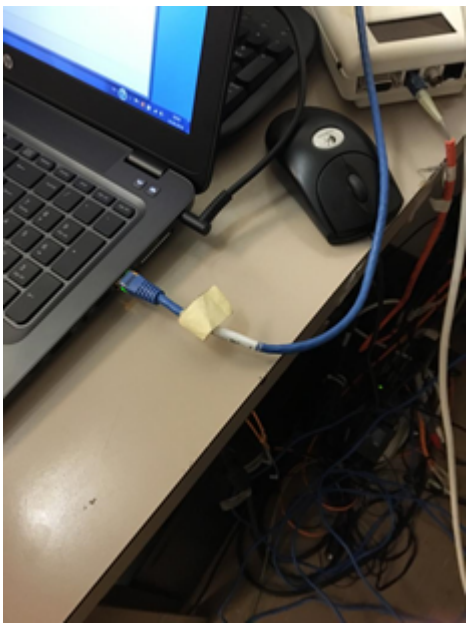
- [ ] Plug in the Power strip containing the ET Power Cable, the PC-tower power, etc


- [ ] Switch on the ET PC-tower. Select "Eyelink" when given the option of which operating system to launch.

- [ ] This is the sync box of the scanner, allowing a synchronization of the triggers between the scanner sequence and the ET recordings.

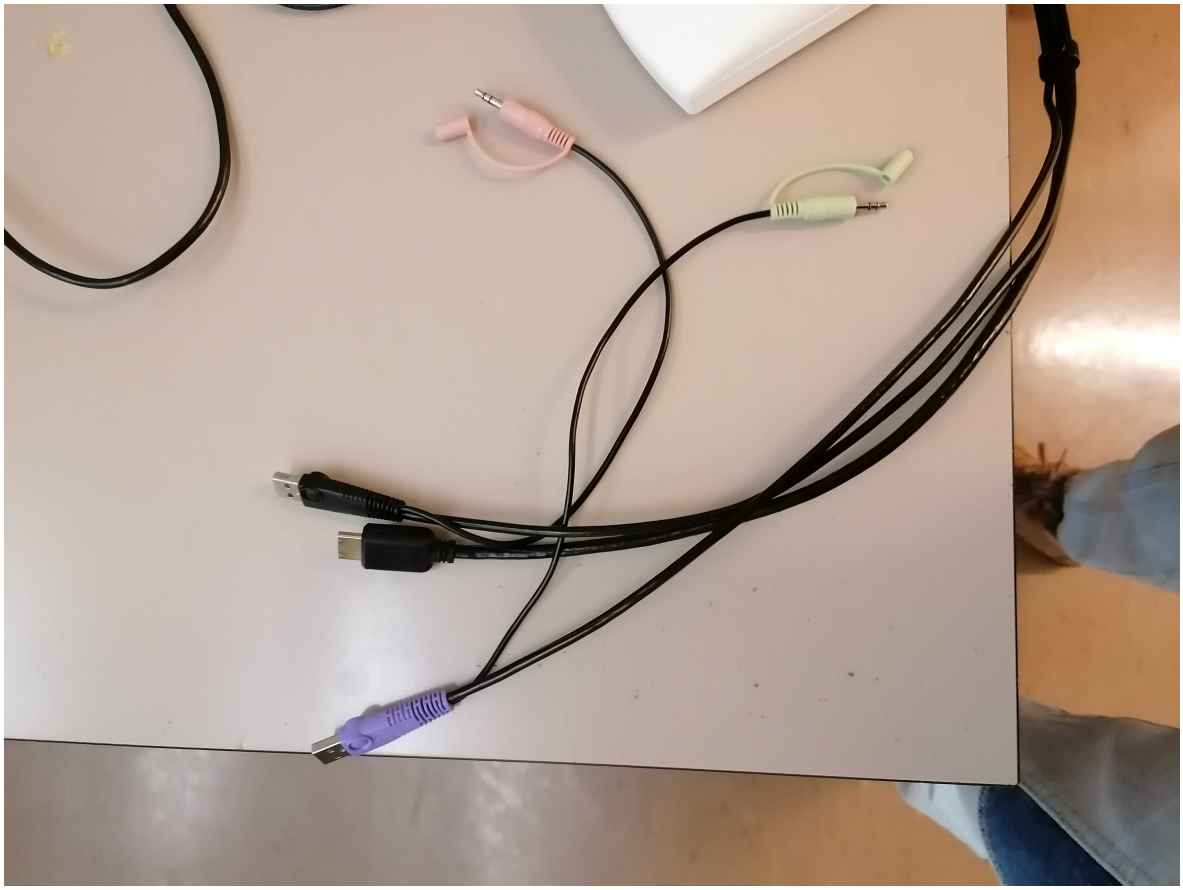


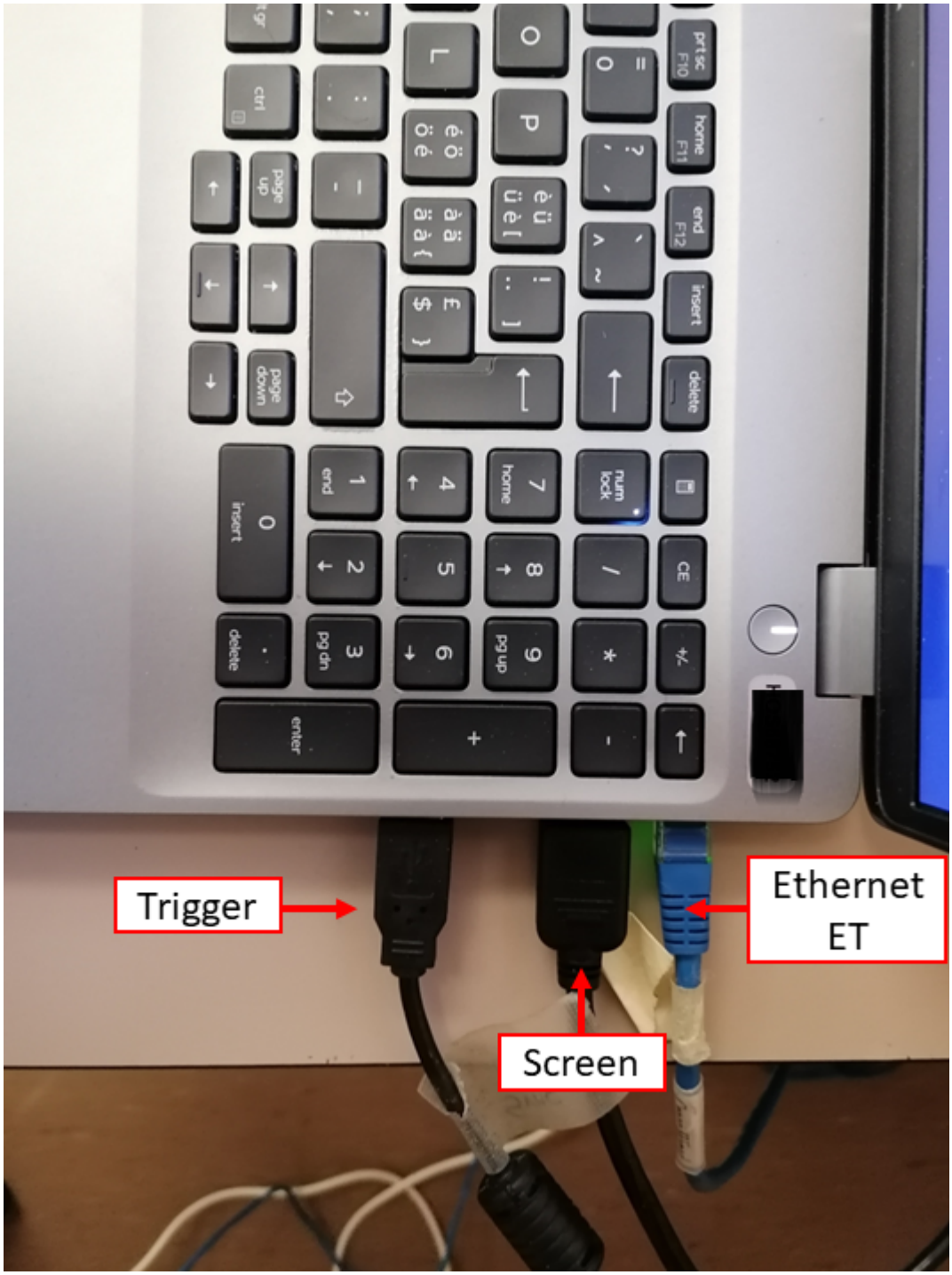
- [ ] Connect to the ET to the [redacted] laptop with the ethernet cable (blue color).



- [ ] Connect the sync box to the laptop with the USB cable. It is normally plugged into the [redacted], it must be re-plugged in after usage.

- [ ] Connect the [redacted] laptop to the screen switch box (see picture below) with the corresponding HDMI cable. This should project your screen on the screen of CHUV's tower [redacted].





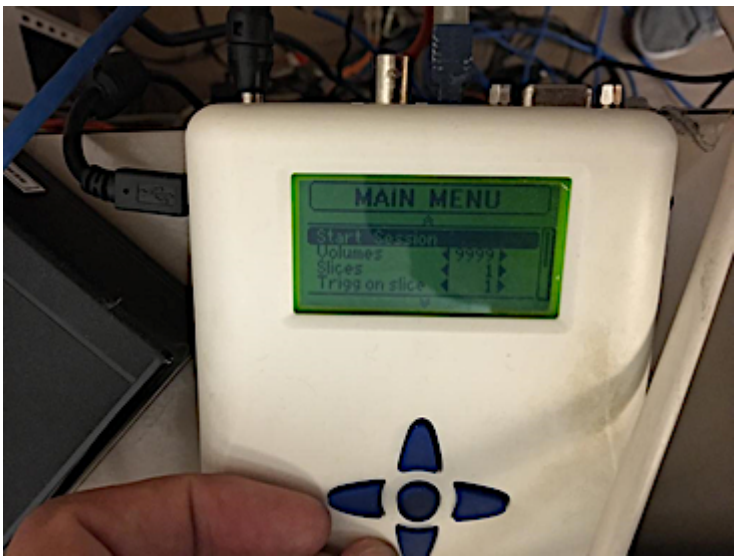
☐ Configure the display settings of the laptop to mirror outputs and set a resolution of 800x600 for both screens. That step and that exact resolution is crucial for the eye-tracker calibration to work.

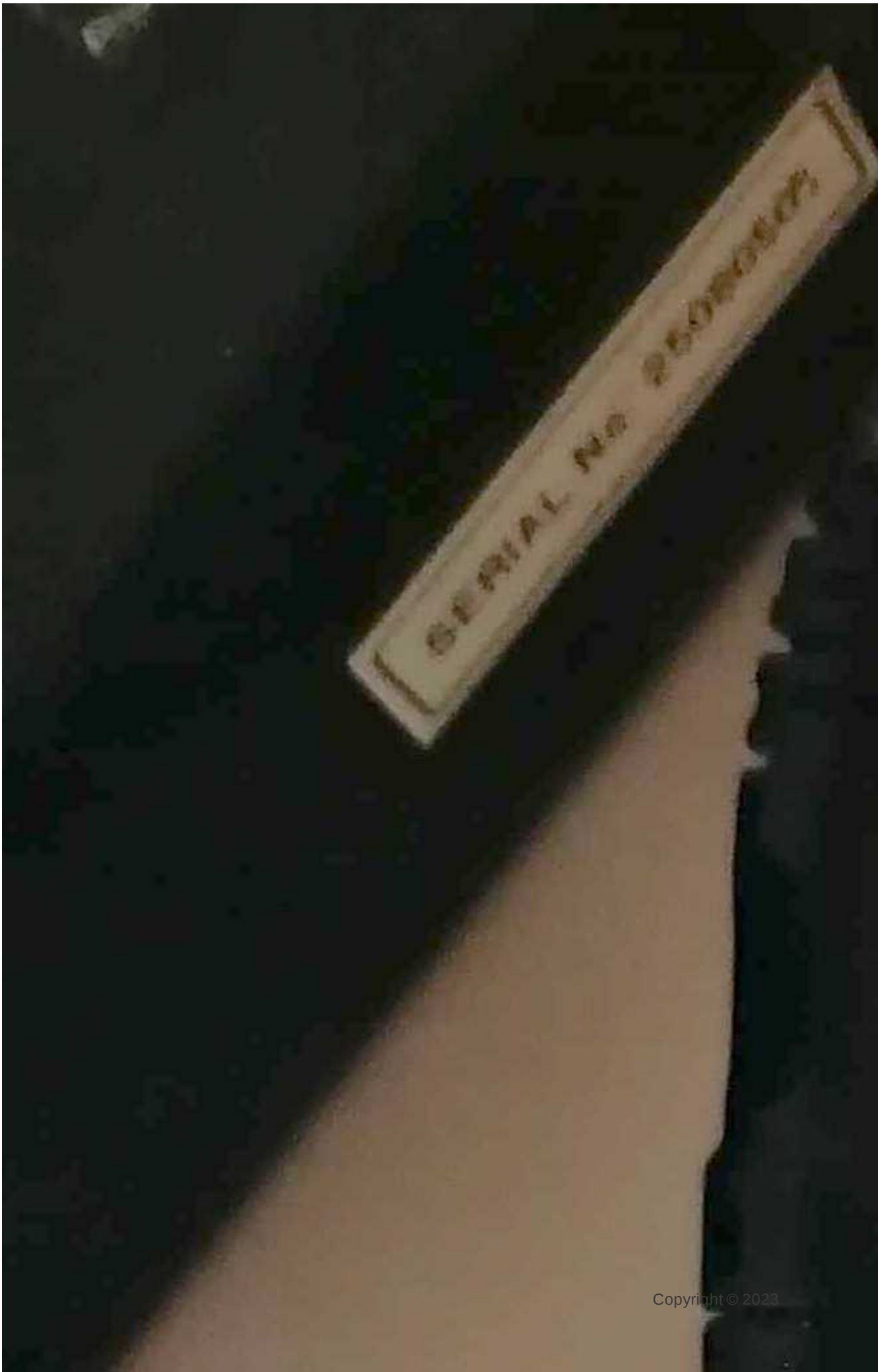
- [ ] Push the button shown below to project your screen on the second screen.

- [ ] Configure the display settings of the laptop to mirror outputs and set a resolution of 800x600 for both screens.
- [ ] Double check that the IP address corresponding to the ethernet interface of the [redacted] laptop is correct. You can either run `ifconfig -a` or use the GUI. Make sure the IP/mask is 100.1.1.2/24, and the protocol is IP version 4. Execute `ping 100.1.1.1` to see if the ET is responding to echoes.
- [ ] Check that you can send trigger events manually:
  - [ ] Enter the "Synchronization" menu by selecting it and pushing the enter button (●).
  - [ ] Hit the down arrow button (▼) until you find "Send trigger"
  - [ ] Push the enter button (●) every time you want to send an `s` character.
  - [ ] Check that the [redacted] laptop types those triggers (e.g., on an open editor receiving keypresses, or the shell prompt).
  - [ ] Check that the BIOPAC is properly registering the trigger too. Every trigger sent should be seen in the *AcqKnowledge* GUI.

- [ ] Start the syncbox session:

  - [ ] Push the up arrow button (▲) until you find "Start session"
  - [ ] Push the enter button (●) and the syncbox will be now waiting for the scanner's trigger signal to forward it.





- [ ] Switch the projector on by hitting the power button on on its right side. The projector is found in room [redacted]. Adjust the projector tilt and centering if the projection does not properly aim the panel inside the scanner's bore. E.g., change the height of the paper pile that supports it (see images, FENS papers).

The hole is the part through which you should check the quality of the projection

- [ ] Verify that the projector projects your laptop screen by looking through the window of the console room.

- [ ] Go back to the [redacted] laptop, open a terminal and execute `conda deactivate`.
- [ ] Open psychopy 3 by typing `psychopy`
- [ ] Open the PCT experiment in *Psychopy* (`control_task.psyexp` file).
  - [ ] Run the experiment by pressing the green play button.
  - [ ] Enter the session and participant number in the pop up window. The Eyelink system setup page opens.
  - [ ] Press enter to begin the *camera setup mode*.
  - [ ] The camera setup mode contains a view of one eye, and you can switch that view between two modes: one is the field-of-view of the ET, the second is an automatic zoom on the eye itself (or a random part if the eye is not visible).
  - [ ] To ease the setup of the ET, switch to the full view in the camera setup mode by pressing the left or right arrow. This will allow you to adjust the ET position as the infrared camera is providing feedback inside the scanning room through the projector.
  - [ ] On the ET computer, verify that the calibration selected is the 6-points one.
    - [ ] Click on `Set Options` on the right of the screen.
    - [ ] On top left under `Calibration type`, choose the image containing 6 points [INSERT PICTURE].

Final checks inside the scanning room

- [ ] Prepare padding: under-knee padding, neck padding, inflatable head-padding.
  - [ ] Wrap a sanitary cover around each padding.

- [ ] Prepare a blanket.
- [ ] Prepare a new pair of earplugs.
- [ ] Check the RB, ECG, and nasal cannula are prepared.

Preparing the participant

Procedures for when the participant has arrived

It is critical to stay alert and anticipate any potential risk to the participant to avert them. This is particularly important for the first session.

Preparation of the participant in the CONTROL ROOM

- [ ] Have participant fill out consent documents and MRI safety screener, and verbally confirm responses, paying attention to frequently forgotten devices and implants, like orthodontia.

DO NOT subject the participant to any risk

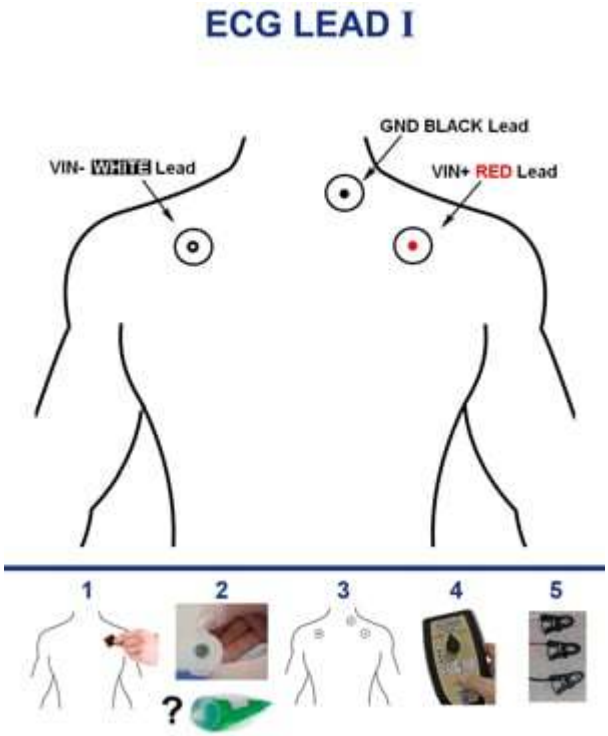
- [ ] In case of any doubts emerging from the MRI safety screening, contact [redacted] immediately at [redacted]. DO NOT PROCEED if the medical contact cannot be reached.
- [ ] In case of discovering any previously undisclosed contraindication, the volunteer MUST NOT participate in the study.

Only female participants, only the first session

- [ ] Provide the participant with a pregnancy test and a urine sample cup.
- [ ] Go over the instructions with them.
- [ ] Accompany them to the bathroom (situated at [redacted]), and ask whether there is anything else they anticipate they will need.
- [ ] If the test is positive, the volunteer MUST NOT participate in the study. You MUST be understanding of the situation as most likely the person will not be aware of the circumstance.

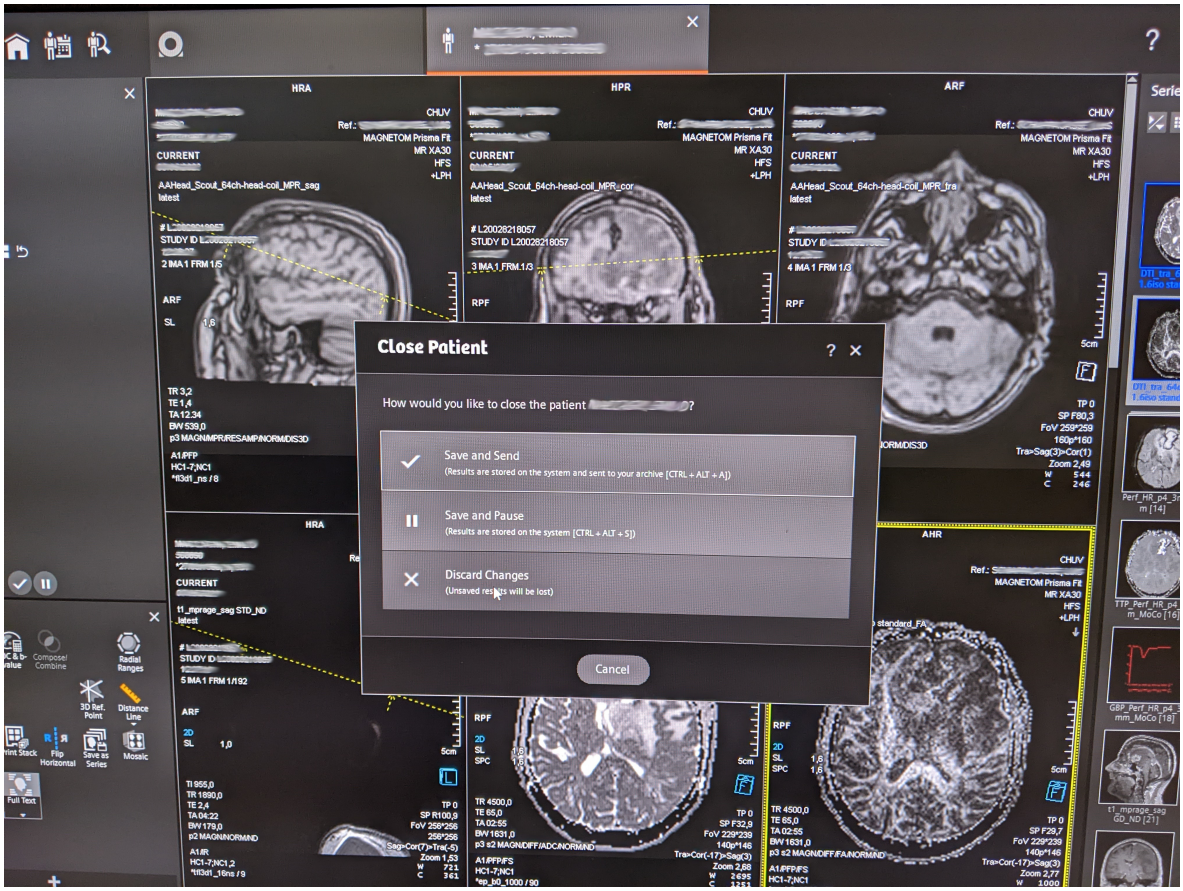
- [ ] Remind the participant to use the bathroom at this moment if they need ([redacted]).
- [ ] Have participant empty their pockets or change into scrubs, and remove all jewelry/hair accessories and check for any missed metallic objects with the scan center's preferred method.
- [ ] Instruct participant on staying still and encourage them to request breaks if necessary.
- [ ] Describe the participant how the session will develop, with special attention to tasks. Answer all the questions that may arise.
- [ ] Tell the participant they will be holding an alarm button throughout the session, and that they may use it any time whenever they need to stop the experiment.
    - [ ] Tell the participant that they MUST leave the alarm button, e.g., on their belly, during the positive control task. Indicate that you will remind them of this before starting the task.
- [ ] Indicate the participant where the door to the changing room is, and ask them to change clothes if necessary.

- [ ] Ask the participant to place the ECG electrodes on the location indicated by the picture below.
  - [ ] Clean the skin with [WHAT?].
  - [ ] Remove the protective film from the electrode.
  - [ ] Stick the electrode on your skin by starting in one side and ironing the rest of the electrode. This procedure ensures that no air is trapped between the electrode and your skin and that no wrinkles from at the edges. Repeat for the three electrodes.

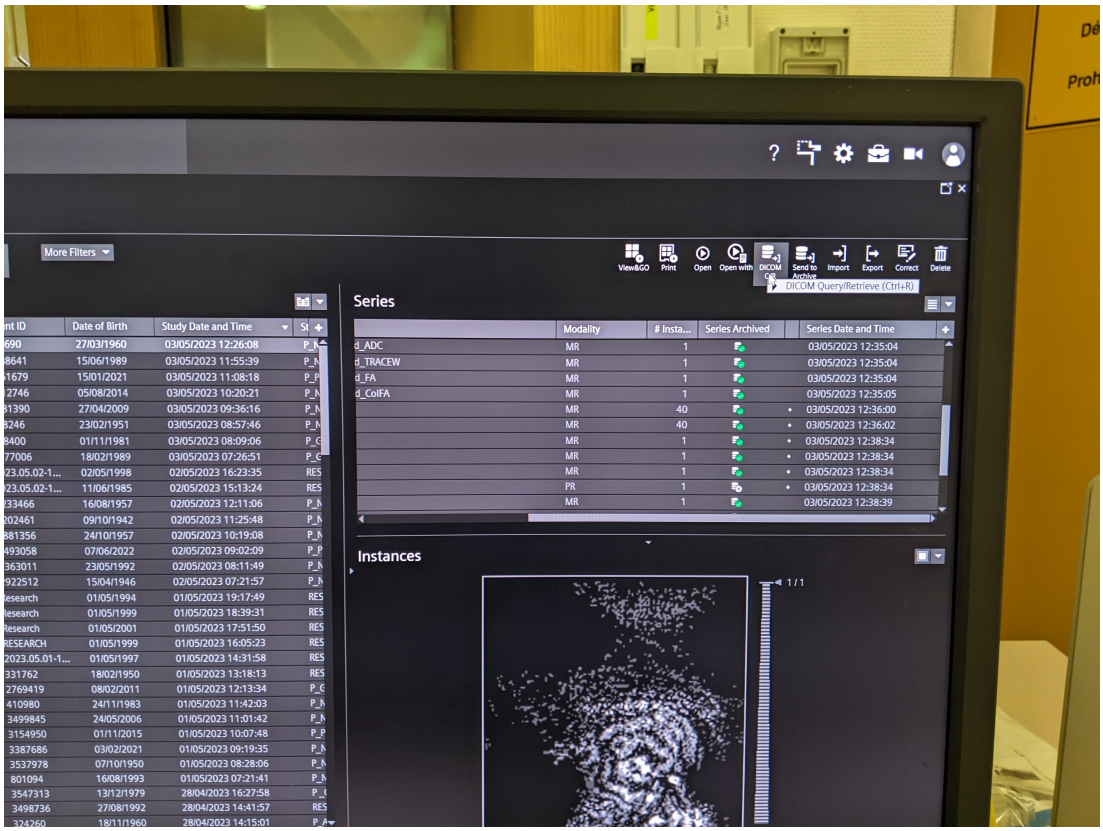


Preparation of the scanning protocol (control console)

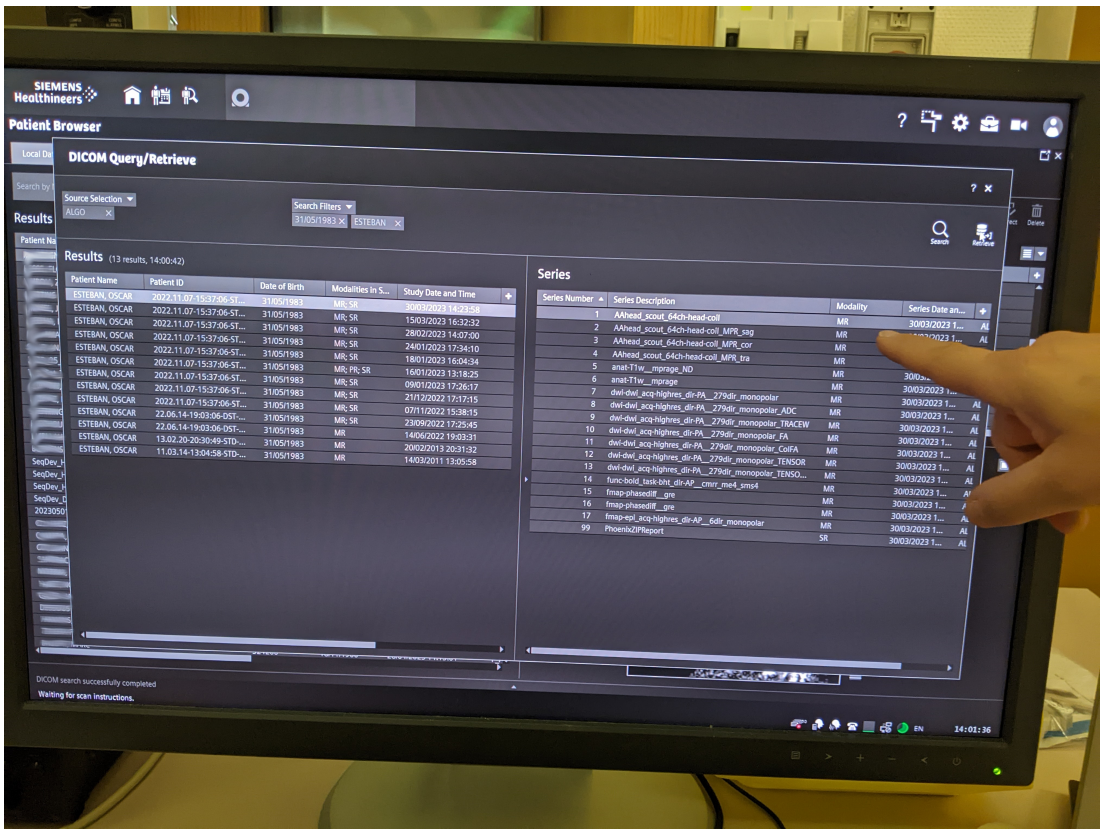
- ☐ Close open patients discarding changes.



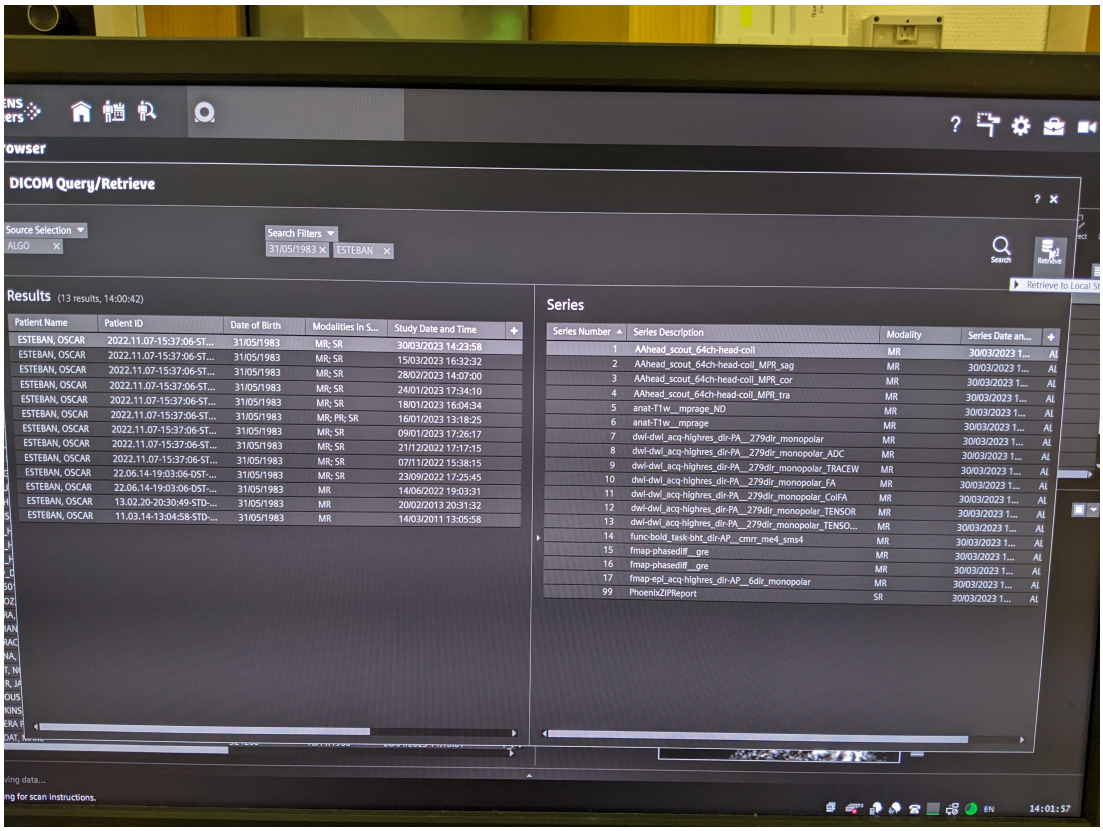
- [ ] Search for the participant by clicking on the "Patient Browser" in the top left corner. If the participant is not shown (because it is archived and hence not locally found):
  - [ ] Click on the *DICOM Q/R* button on the top-right area.



  - [ ] Introduce some unambiguous search criteria:



- [ ] Select the subject (left column) or the sequence (right column) you want to retrieve and hit *Retrieve*. Be careful, you probably want to retrieve a subject, that means make sure you have selected a row on the left column:



- [ ] Go back to the "Patient Browser" and check that the patient now shows up in the local search.

- [ ] Check the head coil is not plugged before initiating a "New examination" to ensure good SNR of the localizer sequence.

- [ ] Right click and select "New examination".

- [ ] In the *Program Selection* tab:

  - [ ] Enter the weight and height of the participant.
  - [ ] Select the right protocol under "RESEARCH/Oscar".
  - [ ] Select *Brain* as the organ.
  - [ ] Select the *Position* as "Head First Supine".
  - [ ] Before you hit "Exam", you can edit general patient's data by changing to the *Patient Registration* tab if you need to edit general information about the patient.
  - [ ] Click the "Exam" button (red background, rightmost-bottom).

- [ ] Load the adequate protocol, making sure of loading the right phase-encoding (PE) direction corresponding to the session.

  - [ ] Double-check that all PE prescriptions are correct.

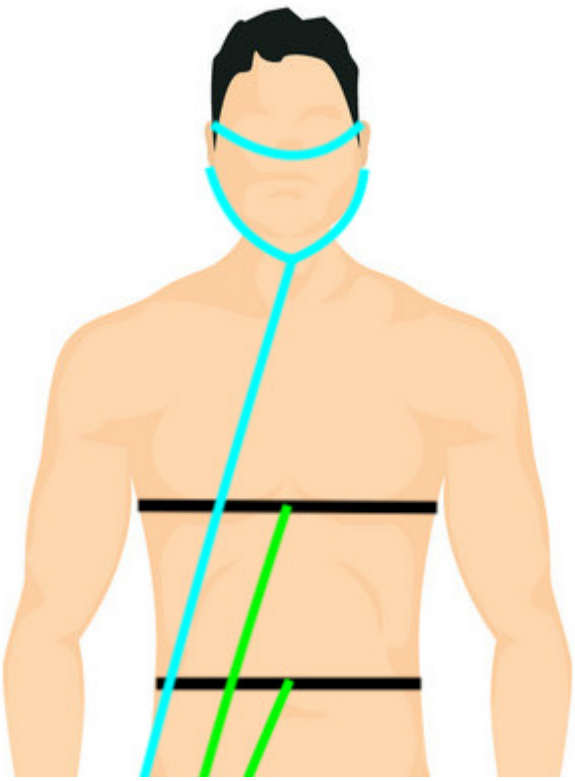
Installing the participant in the SCANNING ROOM

Thanks

Some of the pictures in this section have been extracted from the Ghent Institute for functional and Metabolic Imaging MRI User 2019 *(http://gifmi.ugent.be/drupal/system/files/documents/GIfMI_MRI%20user%20manual_BASIC_SiemensPrisma_EN.pdf)* written by Stephanie Bogaert, MSc, Pieter

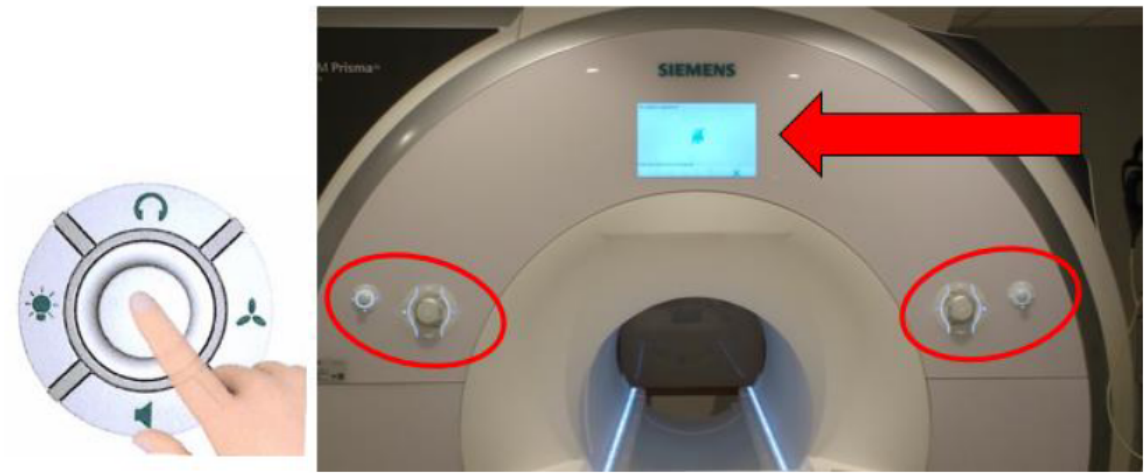
Vandemaele, MSc and Pim Pullens, PhD. We express our gratitude that they put together such a comprehensive guide.

- [ ] Have the participant remove in shoes at the entrance of the scanning room.
- [ ] Bring the participant inside the room, and give them the ear-plugs to protect the hearing during acquisition.
- [ ] Instruct the participant to lay on the MRI bed.
- [ ] Connect the ECG leads on the three electrodes. The electrodes MUST be connected following the color scheme [ADD DETAILS]
- [ ] Install the respiration belt below the participant's chest and connect it to the tube as shown in the picture below. The respiration belt measure the displacement induced by breathing, it thus needs to surround the chest or stomach comfortably, depending on the subject respiration (diaphragmatic or chest breathing). The belt should be tight.



- [ ] Place the nasal cannula in the nose of the participant making sure the two protrusions are aligned with the nostrils of the participant. Place the tube behind the ears and tighten under the chin for comfort and stability by sliding the ring as shown in the picture above.
- [ ] Check that the GA is properly working by asking the participant to do the following task: breathe in for 3s, breathe out for 3s. Do it 3x. Give orally the instructions "breathe in"/"breathe out" to make the task easier. After the last "breathe out", ask the participant to hold their breath for 3s and then let them breathe normally again [TO DO: INSERT PICTURE OF WHAT THE SIGNAL SHOULD LOOK LIKE].
- [ ] Once the subject is lying on the MR bed, check that no arms/legs lye on the GA or the RB tubes.

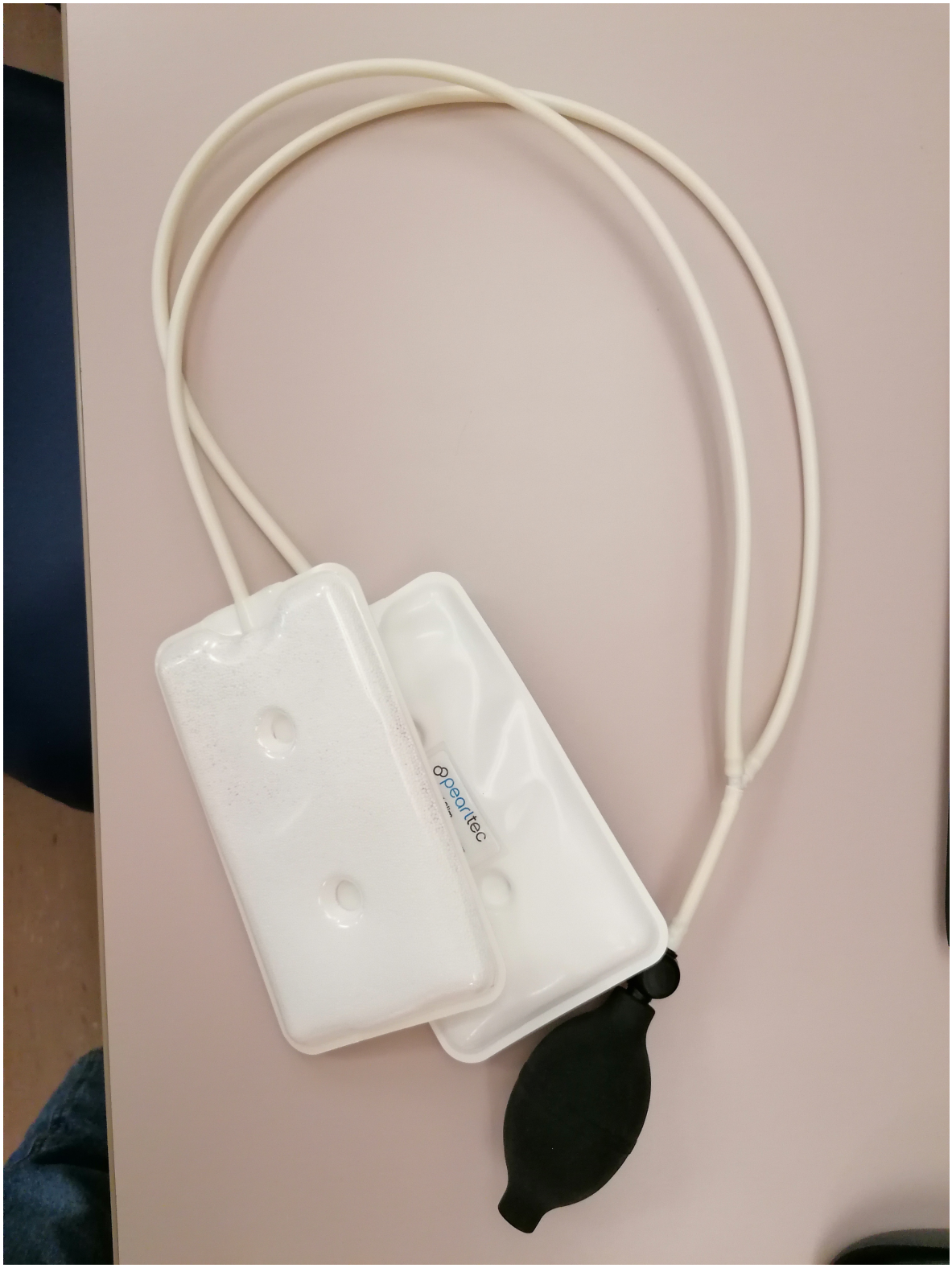
- [ ] Give to the participant the emergency button. Make the participant try it, so they can see it works. To switch off the alarm, there's a button on the scanner (circular, both on the left and on the right of the hole)



- [ ] Adjust the participant inside. With the paddings, their head position MUST be adjusted and elevated so that the nose and the forehead of the participant are both close to the upper coil. This procedure ensures the ET has the clearest possible view of eye.

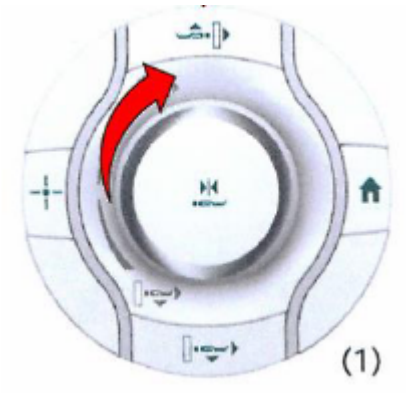
- [ ] This part must be repeated taking out and putting back the upper part of the head-coil, adjusting the pillow at every step, until the head is fixed and the nose and forehead of the participant almost touch the coil. In case of need, ask the participant to "say yes" with the head (chin on neck) and keep this position, place the pillows, place the coil and check that the participants' front touches the coil. Now the nose can also be a bit far from the coil. Tell the participant to relax the neck, so the nose should go a bit up and touch the coil.

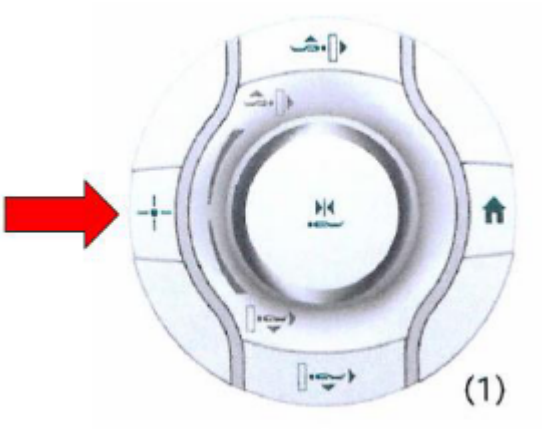
- [ ] Take the Ears-protection pillow, stick it on top of the ears of the participant, one by one. Once they are settled, you can pump it, until the participant is comfortable, the head is fixed and the ears are protected.



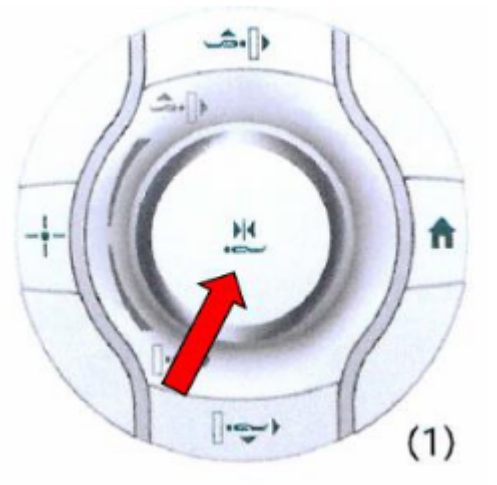
- [ ] Ask the participant if they are feeling cold. Cover them with a blanket if necessary.
- [ ] Solicit feedback on participant's comfort while positioning them on the scanner bed and suggest ergonomic positioning of arms to avoid discomfort. Remind the participant not to create closed loops by crossing their legs or holding their hands together.

- [ ] Gently move the participant with the manual regulation. Stop when the head is under the head-localizer. Ask the participant to close their eyes, press the laser alignment button and align the head-coil markers with the red light.





- [ ] Switch off the alignment light, now the participant can open their eyes. You can move the participant (always gently as before) inside the scanner manually, until the mm counter marks "Isometric" or you can press the rotary knob for two seconds. This will send the participant to the isocenter automatically.



- [ ] Go behind the scanner, push the plexiglas panel until it touches the bed.

- [ ] You should see the projection of the calibration mode as you left it open before.

- [ ] Regulate the ET position until you see from the projector screen the eye. Once the eye is well seen and tracked, the image is zoomed (externally by the operator in front of the PC-tower) to the pupil and two crosses appear on the eye. In case of need, the right lens can be manipulated rotating the roller, like what you would do with your reflex to obtain the focus. If the position of the ET is not satisfying, you can move the base. As a last resort, you can also adjust the strength of the infrared light (emitter). This is the black box on the other side with respect to the lens. Under the emitter there are two little screws. Unscrew, move the emitter front/back, check the contrast of the face image, re-screw.

- [ ] If the pupil is correctly seen, as well as the eye (indicated by the crosses following their movement), you can go out.

    - [ ] Inform the participant that you are leaving the room, and that you are going to first check with them whether the speaker works well, immediately.

- [ ] Make sure the speaker is audible (and not annoying) and confirm the participant's feedback:

    - [ ] Keep on pressing the speak mode button to give instructions (1). Set the volume control of your microphone by pressing the +/- buttons. > Hey [NAME], can you hear me well ?

    - [ ] To listen to participant answer, press the listen mode button once (2). Loosen the speak mode button! Set the volume control of the participant’s microphone by pressing the +/- buttons.

        - [ ] If this volume increase is not enough for the participant to hear you well, proceed as follow:
            - [ ] In the Siemens program, click on Configuration represented by a gear wheel at the top right of the screen.
            - [ ] Click on `Configuration panel`

- [ ] Under the section `Scan application`, locate the icon of the speaker and tune the volume to the maximum.
- [ ] Click `Apply`

> **Important**
>
> The red button (3) is the table stop button. Pressing this will immediately stop your sequence from running and will stop the participant table movement.

speaker

- [ ] Switch the ET camera back to zoomed mode, and exit the camera mode by pressing `Enter`.

- [ ] Inform the participant about the calibration process.

> Hey [NAME], we are about to start the scanning session. First, we are going to calibrate the eye tracker. Please follow the small circle on the screen with your eyes, without moving your head. The circle will move around the screen. Please focus your gaze and follow it when it moves (do not anticipate).

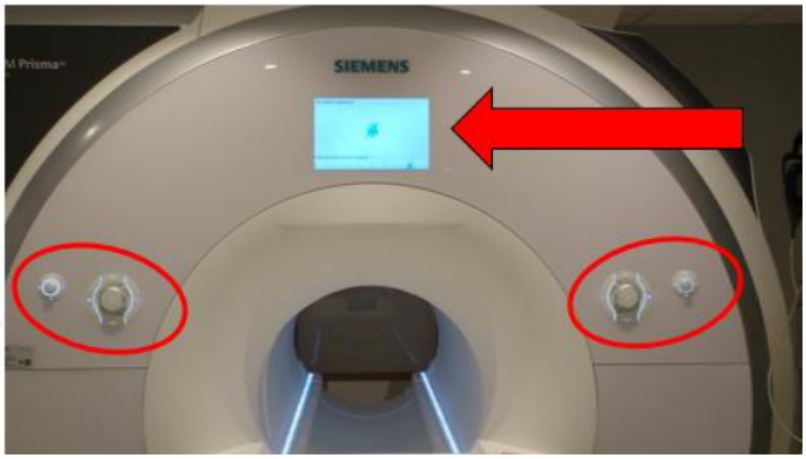
- [ ] Launch the ET calibration by pressing C on the laptop keyboard or by clicking on Calibration on the ET interface:
    - [ ] When the gaze is stable, the button `Accept fixation` appears green, then you can manually click on it to validate the first position [INSERT PIC].
    - [ ] The following positions should be validated automatically when the gase is stable enough. If it is not the case, manually click on the validate button when it turns green
- [ ] The ET software MUST show a cross during the calibration. If it does not, try sequentially the following:
    - [ ] readjust the focus of the ET; and if it still doesn't show the cross,
    - [ ] readjust the mirror frame position sliding it throught the rails attached to the coil; and if it still doesn't show the cross,
    - [ ] readjust the participant's head positioning inside the coil; and if it still doesn't show the cross,
    - [ ] move the mirror up or down (being careful as mentioned before). Just a few mm can ruin the calibration and the eye-position; and if it still doesn't show the cross,
    - [ ] iterate over the previous steps.
- [ ] When the calibration is successful, launch the validation by clicking on validation on the ET interface or clicking V on the keyboard of the laptop. Follow the same instructions as in the calibration to validate the positions.
- [ ] If the validation is not ok, iterate over previous steps restarting calibration. Otherwise, you can move forward.

Running the scanning session

BE REACTIVE in case the alarm rings

If at any point the participant rings the alarm, it is crucial to enter the scanning room and check on the participant IMMEDIATELY.

- [ ] Enter the scanning room
- [ ] Only then turn off the alarm using the circular button either on the left or on the right of the bore.

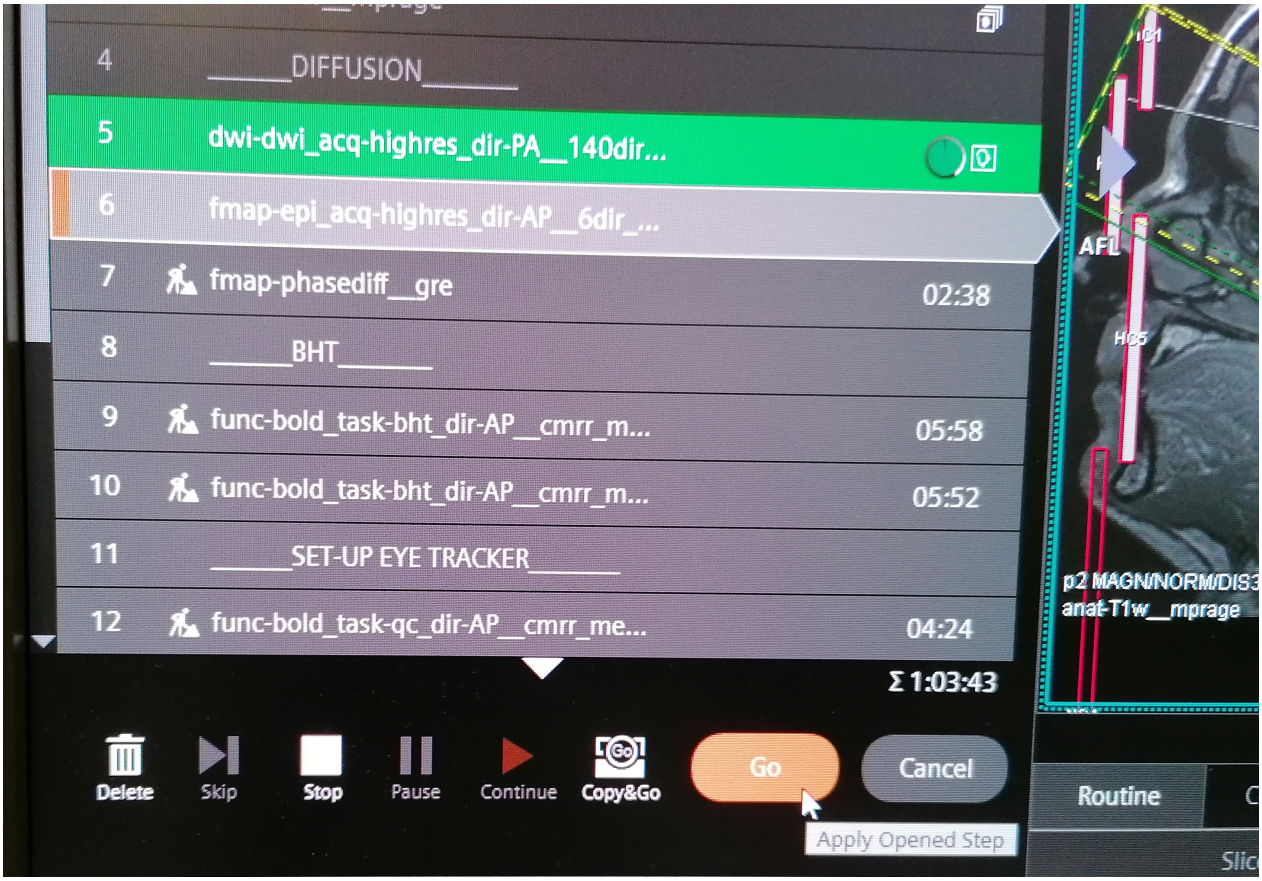


- [ ] Ask to the participant what's wrong.
  - [ ] If he needs reassurance or information, provide it and confirm he can continue the scanning session. However, if you cannot communicate efficiently, take the participant out of the scanner.
  - [ ] If the participant does not feel well, provide assistance or call [WHO?] if it is really serious or if you have any doubts.

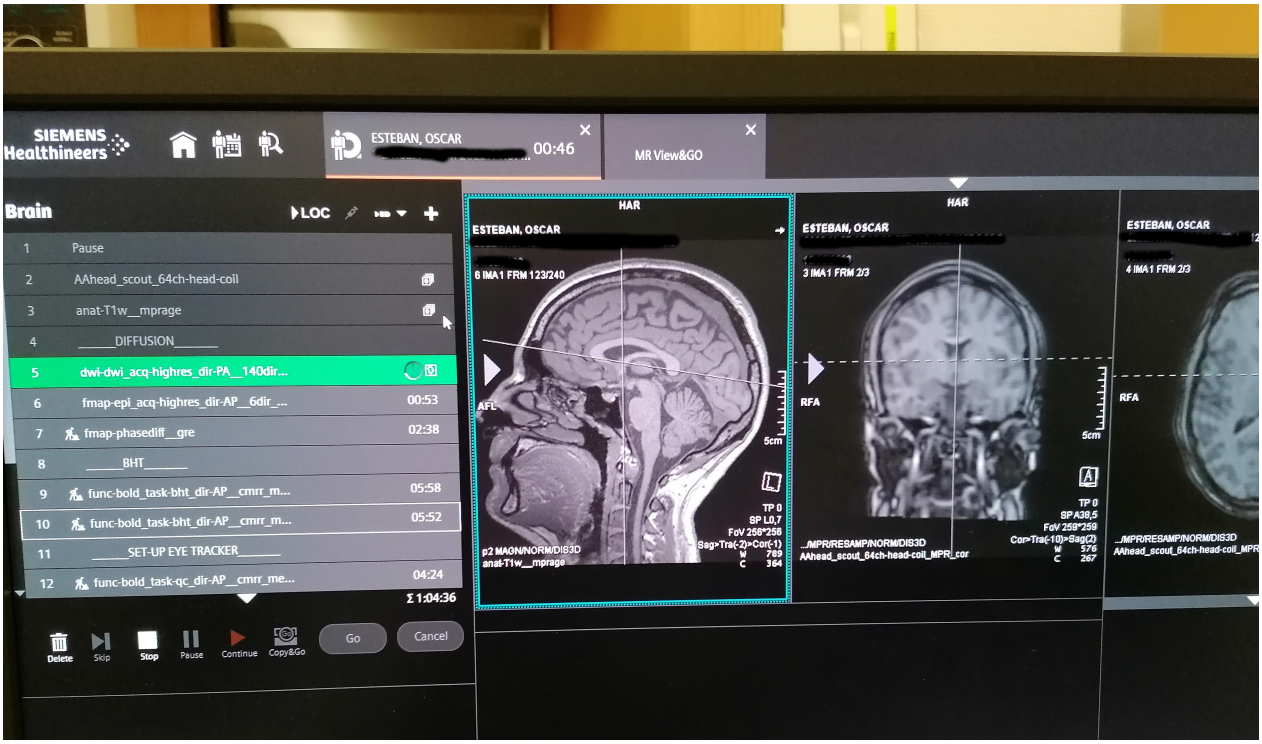
- [ ] Indicate the participant that the scanning will soon start:

> Hey [NAME], we are about to start our first scan run. For this scan, all you have to do is stay still, and look at the screen. Are you ready?

- [ ] Start Exam
- [ ] Launch the AAhead_scout by pressing `Go`.



- [ ] Once the scout is finished, you can drag the localizer into the scan viewing window by draging the three superposed squares next to the sequence name to check its quality. A localizer of bad quality will present noise in the background. If the localizer is not ok, unplug and replug the head coil and reacquire the AAhead_scout sequence.

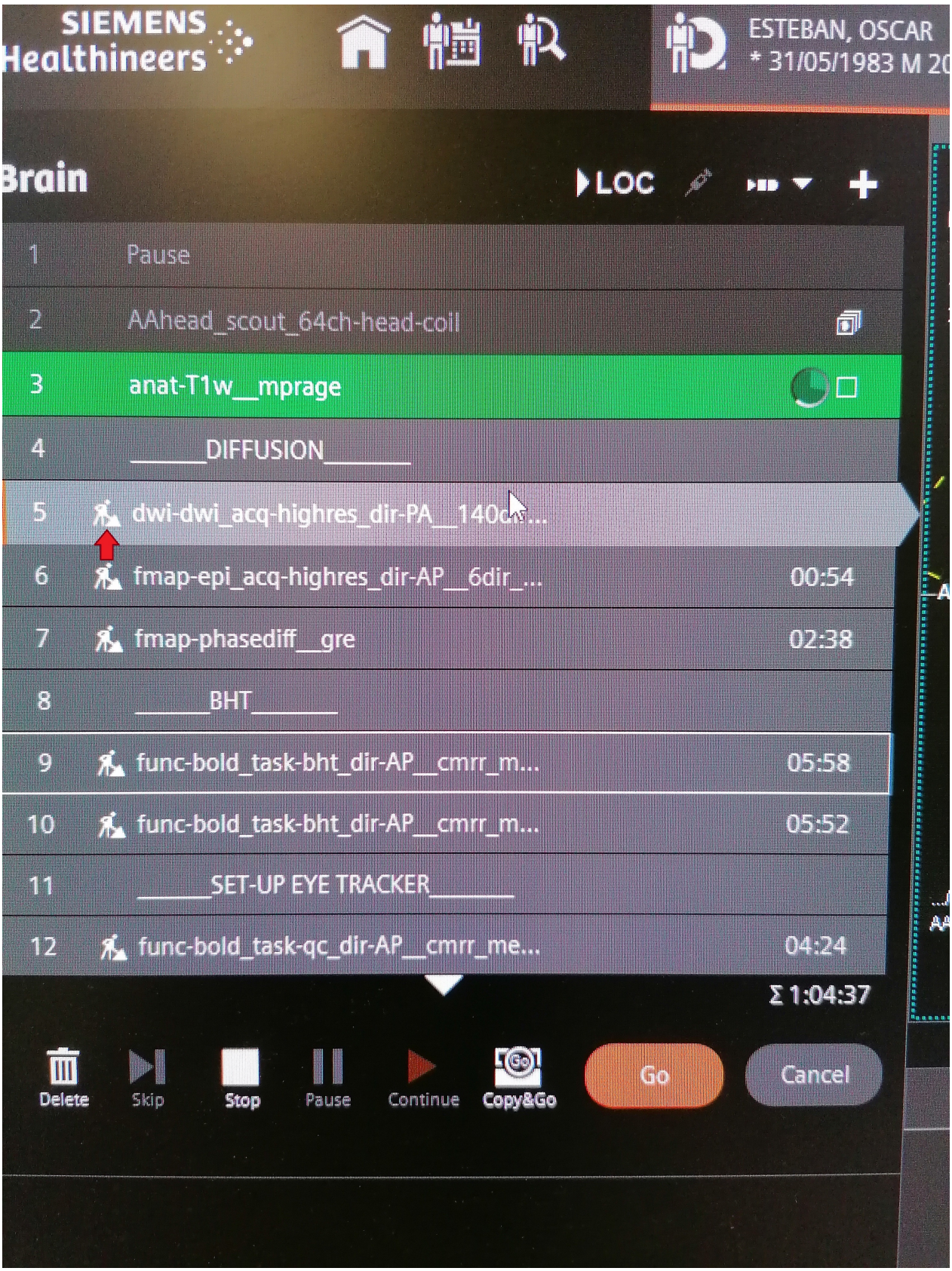


- [ ] Launch the T1w by pressing Go.
- [ ] While you run the T1w, there are a few important points to address:

> **Important**
>
> - [ ] Adapt the reproin name of the sequence according to its "Phase Encoding Dir." field.
> - [ ] Open the parameters of the sequence named "fmap-phasediff__gre" and ensure that under Contrast>resc. the option "Magnitude et phase" is selected. This is crucial so that both the magnitude and the phase difference field map images are saved.

- [ ] Once the T1w is finished, you can drag the T1w into the scan viewing window. This will allow to tweek the field-of-view (FOV) for the DWI and BOLD sequences.
  - [ ] Make sure that the FOV (yellow square) includes the whole brain. If the full brain, including the cerebellum, do not fit in the FOV, favorise making sure that the cortex is fully enclosed in the yellow square. Careful for reproduciblity do not tilt the FOV; just translate it.
  - [ ] If two sequences have the same resolution and the same number of slices, you can copy paste the FOV by right clicking on the sequence for which the FOV was set, select "copy parameters>[WHAT WAS THE NAME]".
  - [ ] Once the FOV is well placed, launch the sequence by pressing "Go".

☐ You can set the worker icon on the left of the sequence by clicking on it if you want to pause before starting that sequence. If the worker is not present, the sequence will launch automatically. The bloc with "__x___" introduces break. The scanner will warn you [WHAT IS THE MESSAGE?], just click "Ok" as it is not relevant to these sequences.

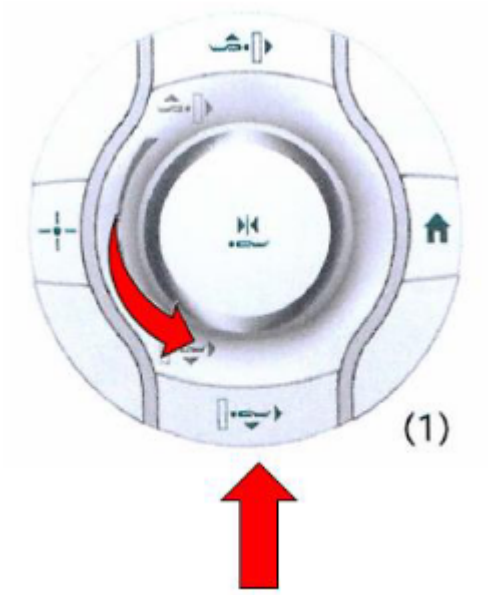


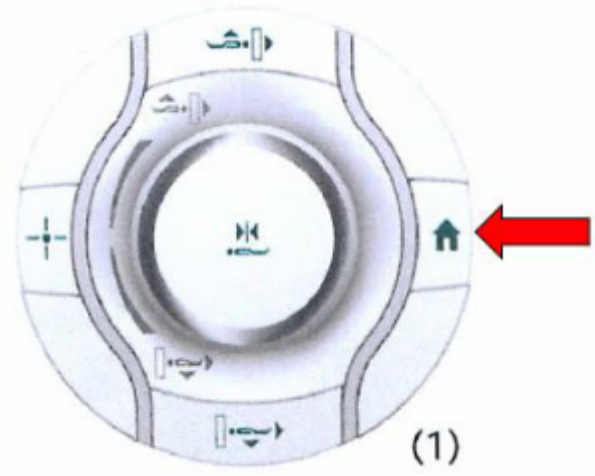
- [ ] Check in with participant frequently.
- [ ] Watch for motion if you can see the participant, or use motion monitoring equipment.

Session tear-down

Showing the participant out

- [ ] Extract the bed from the scanner's bore using the scanner's control wheel. The home button can be used to bring the bed out.





- [ ] Unplug the head coil from the bed connector and then lift the lever that releases the upper part of the coil, put it aside (e.g., inside the bore).
- [ ] Release the air from the inflatable padding pushing the release valve of the pump and take them away. Remove the disposable covers and throw them away in the trash container.
- [ ] Help the participant sit down.
- [ ] Help the participant remove the earplugs and dispose of them. Ask them about the experience:

> [NAME], how was your experience? Have you been able to feel comfortable throughout the session? What advice, indication do you feel we could've provided you for a better experience?

- [ ] Lift the nasal cannula and help the participant remove it from their head.

- [ ] Disconnect the tube from the RB and then lift the velcro attachmet to remove the RB.
- [ ] Disconnect the ECG leads
- [ ] Help the participant step down and accompany them out into the control room.
- [ ] Help the participant recover their personal belongings and change clothes if necessary.
- [ ] Solicit more feedback on participant's comfort for future sessions.
- [ ] Solicit tickets and receipts for transportation.
- [ ] Give the participant the corresponding compensation for the participation and transportation.
- [ ] Request a signed receipt of the amount.

AFTER SCAN, inside the scanner room

- [ ] Carefully remove the infrared mirror:
    - [ ] Enter again the scanner room with the plastic container of the mirror and leave it prepared on the bed.
    - [ ] Separate the mirror frame from the upper part of the head coil and lay it on the bed.
    - [ ] PUT ON A NEW PAIR OF GLOVES
    - [ ] Remove the scotch tape holding the infrared mirror and IMMEDIATELY insert the mirror in its plastic bag.
    - [ ] Take the mirror in its bag OUT OF THE SCANNING ROOM and place it back in the fMRI box, with extreme care.
    - [ ] Re-enter the scanning room and clean the standard mirror removing all residues of glue from the scotch tape. Re-attach the mirror to its coil's frame.

- [ ] Cleaning up instrumentation:
    - [ ] Take the projector's screen off and store it in its designated shelf.
    - [ ] Unplug the two cables connected to the ET (signal and power). Put those extremities aside far from the scanner.
    - [ ] Take the ET back outside and put it in a stable place.
    - [ ] Unscrew the ET lens, while ALWAYS keeping one hand under the lens while screwing/unscrewing it and put it back into its cover.

- [ ] Put the cover, the ET base back in the fMRI box, being extremely careful to not crush the mirror.

- [ ] Re-enter the scanning room.
  - [ ] Disconnect the ECG leads from the filter of the access panel, fold the cable and leave it prepared with the RB to take out of the room with other equipment.
  - [ ] Disconnect the last section of the cannula and dispose of it in the trash can.
  - [ ] Take the ECG electrodes, the RB, and the plexiglas base outside to the control room.
- [ ] With someone outside in the control room:
  - [ ] Careful extract the cables (fiber and power of the ET) back through the access tube. The person outside will carefully roll them around being extremely careful, and place them in the rolling table of the ET computer.
  - [ ] Extract the RB and the GA tubing from the room. Likewise, the person outside will carefully roll and store them.
- [ ] Clean-up of the scanning room:
  - [ ] Put the pillows back in place.

- [ ] Clean up the head coil (bottom and upper parts), and lock it back with its bottom part, do not plug the connectors.
- [ ] Remove the head coil and put it in the scanner's bore.
- [ ] Remove the back padding elements and put them back in their designated storage.
- [ ] Reinstall the spine coil.
- [ ] Put the bed back in place = push the "home" button on the scanner
- [ ] Put the wooden stopper of the main access tube back on the tube.
- [ ] Everything that is removed for the experiment MUST be put back in place and the end of the experiment, i.e. position of the bed, coil, emergency button, ears cover.
- [ ] Take a glove, on the right there is some cleaning napkins. Use them to clean the bed.
- [ ] exit and Close the External door.

AFTER SCAN, outside scanner room

- [ ] Switch off the projector.
- [ ] Retrieve ET recordings (from [redacted]):
  - [ ] Insert a USB key into [redacted] and save the experiment from AcqKnowledge.
  - [ ] Upload to a pre-designated drop-box (e.g., using Dropbox)
- [ ] Switch off laptop and ET PC Tower. Plug back the sync box and the VGA projector where they were.
- [ ] Fix the rolled cable with the scotch on the PC Tower base.
- [ ] Take the ET, Remove (always with and hand under the lens) the MRI compatible LENS. Put it back to its contained inside the box.
- [ ] Put back the regular Lens.
- [ ] Bring back the box and the base at CIBM EEG lab. Put the keys back under old Nora's desk.
- [ ] Fix the ET with the scotch at the chariot.
- [ ] Bring back the chariot and the TMS laptop at the TMS lab

Turn off the MRI system if no more sessions are scheduled afterward

It is critical to follow the steps in order, ensuring each step is completed before proceeding further

- [ ] Turn off the satellite station ([redacted], the computer on the left side of the control desk)
- [ ] Turn off the control station ([redacted], the computer on the right side of the control desk)
- [ ] Push the blue button (circle and a dot outside) with the SYSTEM OFF label underneath, which is found right above the key
- [ ] Turn the key into the *closed lock* position (🔒)

Data management

Within one week after the completed session

Download the data from the PACS with PACSMAN (only authorized users)

- [ ] Login into the PACSMAN computer (**)
- [ ] Mount a remote filesystem through sshfs:

```
sshfs <hostname>:/data/datasets/hcph-pilot/rawdata \
                $HOME/data/hcph-pilot \
      <args>
```

- [ ] Edit the query file `vim $HOME/queries/mydata-onesession.csv` (most likely, just update with the session's date)

mydata-onesession.csv

```
PatientID,StudyDate
2022_11_07*,20230503
```

- [ ] Prepare and run PACSMAN, pointing the output to the mounted directory.

```
conda activate pacsman_min_dev_v2
python /home/localadmin/Bureau/PACSMAN/PACSMAN/pacsman.py --sav
       -q $HOME/queries/mydata-onesession.csv \
       --out_directory $HOME/data/hcph-pilot/ \
       --config /home/localadmin/Bureau/PACSMAN/PACSMAN/files/c
```

- [ ] Remove write permissions on the newly downloaded data:

```
chmod -R a-w $HOME/data/hcph-pilot/sub-01/ses-*
```

- [ ] Unmount the remote filesystem:

```
sudo umount $HOME/data/hcph-pilot
```

CRITICAL: WITHIN 48h after the FIRST session

- [ ] Send the T1-weighted and T2-weighted scan to [redacted] for screening and incidental findings.

Retrieve physiological recordings (from [redacted])

Copy original DICOMs into the archive of Stockage HOrUs

Within two weeks after the completed session

Convert data to BIDS with HeudiConv and Phys2BIDS

- [ ] Careful to change the number of the session ! Note that we use the heuristic -f reproin, because we have name the sequences at the console following ReproIn convention.

Executing HeudiConv

```
#!/bin/bash
heudiconv -s "pilot" -ss "08" -f heuristic_reproin.py -b \
          -o /data/datasets/hcph-pilot/ \
          --files /data/datasets/hcph-pilot/sourcedata/\
                  sub-01/\
                  ses-18950702/ \
          -l .
```

Incorporate into version control with DataLad

Initiating the version-controled dataset

Once at the beginning of the project, the datalad dataset will be created:

- [ ] Add stockage horus as an SSH remote.

Run quality control with MRIQC

- [ ] Register the MRIQC container with DataLad containers-run
- [ ] Run MRIQC:

```
datalad containers-run \
    --container-name containers/mriqc \
    --input sourcedata \
    --output . \
    '{inputs}' '{outputs}' participant --session lastsession -v
```

- [ ] Screen the T1w, DWI and BOLD visual reports, assign a quality assessment using *Q'Kay*
- [ ] If either the dMRI or the RSfMRI quality is insufficient, schedule an extra session after the initially-planned scanning period to reacquire it.

Preprocessing

Release of data