

PLAN FOR THE PHASED RETURN TO RESEARCH IN THE
TRINITY COLLEGE INSTITUTE OF NEUROSCIENCE
(TCIN), DURING THE COVID-19 PANDEMIC.

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Phase 1: Return of laboratory-based research.

Summary

Trinity College Institute of Neuroscience will resume laboratory-based research work in a phased manner and has developed plans for a safe working environment during the COVID-19 pandemic (detailed below) in keeping with Government and College guidelines. Key elements of the first phase of this plan are: a) dividing the working day into two 5 hours shifts, with groups of researchers assigned one working shift per day; (b) ensuring that work of researchers between shifts will not overlap except in cases where the need is set out and justified. (c) social distancing by requiring no more than one person to working one room at any one time, with exceptions for large rooms in unusual circumstances to be justified; and (d) timetabling across labs within each shift in advance to ensure that adequate distancing can take place within each room/laboratory and to facilitate contact tracing. Desk-based research will continue to be carried out at home. By implementing this plan, we believe it is possible to safely resume critical laboratory-based activities and in doing so negate transmission and health risks associated with the COVID-19 pandemic while maintaining research activity. In this first phase of reopening, only a small number of researchers will be allowed in each shift. In later phases, we hope that researcher numbers can increase in number safely over time.

The need for resuming laboratory-based research in TCIN

The research undertaken by PhD students and postdoctoral researchers in TCIN commonly requires comparative medicine models and associated molecular, genetic, biochemical, cell and tissue culture experiments. Many experiments that began early this year had to be prematurely terminated when College closed at the beginning of the COVID-19 lockdown. Most researchers based in TCIN have lost several months of laboratory time, with little data generated since the start of the year. For researchers who: (a) are due to finish their projects this year; (b) have grants terminating; or (c) have grants needing to be renewed shortly, it is critically important for their careers and mental health that they are permitted to return imminently to safe laboratory-based research. This is particularly the case for PhD students who are due to finish and postdoctoral researchers working on funded projects with key deliverables due in the coming months. No funding is available to extend the contracts/stipends of these researchers and salary costs continue to be accrued during the period of the lockdown. Thus, we need to resume limited laboratory-based activities to help address the career needs and psychological states of those researchers most affected as well as to slowly regain momentum and a sense of purpose for TCIN researchers.

Who needs to undertake laboratory-based research in TCIN?

Postgraduate and postdoctoral researchers require access to laboratories in TCIN to complete and to build momentum on time-sensitive projects. In Phase 1 of this TCIN return to work plan, we have identified 10 PI's/biological laboratory based research groups who require access to labs urgently. We are proposing that

these researchers return on a phased basis from **May 25th**. Lab based researchers with less critical time sensitive projects will be added over a period of weeks/months and as restrictions further ease. Later dates will be proposed in a follow up plan for the return to work of researchers undertaking research involving direct contact with human subjects for studies requiring, for instance, sample collection, EEG, MRI or TMS. The times for reopening such human studies in the Lloyd Building will be elaborated in Part 2 to be submitted in June, which is being developed by TCIN in coordination with Schools of Psychology and Medicine, while taking account of Government and College advice.

Ensuring a safe working environment in TCIN during the COVID-19 pandemic

Each PI led research group will complete a plan including a risk assessment and rota for the proposed experimental work to be carried out and name of a member in charge of their lab safety arrangements. The plan will be submitted to a 'Return to workplace' Committee established to oversee the phased return of research personnel. The Committee will be responsible for reviewing submissions, making recommendations and taking decisions relating to the resumption of laboratory based activity initially, and in later phases, of human oriented research. The Committee will meet online (e.g. Microsoft Teams, Zoom) to consider submissions on a weekly basis. Plans will be monitored and restrictions or counter-measures will be taken where there is evidence of non-compliance with submitted plans which have been approved. The numbers of researchers returning to work (May 25th to June 29th) will be limited to 1 per work area so that appropriate social distancing and traceability can be maintained in order to minimize the risk of transmission of COVID-19.

Initially those researchers wishing to return to work in TCIN, and who cannot undertake this work at home, will be offered either a morning or afternoon shift. Researchers on the morning shift will have access to the workplace from 8am-1pm and those on the afternoon shift will be granted access from 2pm-7pm. These times may be altered by the TCIN Committee in consultation with Estates & Facilities, based on the availability of attendants and enforcement of a no lone working safety policy in the building. In order to maintain social distancing protocols and to facilitate contact tracing, researchers assigned to shifts will not overlap or interact. There may be instances however where a researcher will have to work throughout the day and in both shifts. This will be considered on request. Assignment to shifts will be based on practical considerations such as equipment availability and experimental duration. Researchers who live together will work together and researchers who intend to perform similar activities on shared equipment (e.g. cell culture) may be assigned to separate shifts to maximize resource availability and physical distancing.

Logistics & Management

- A Return to workplace Committee has been established composed of the Deputy Director of TCIN (Prof Andrew Harkin) and Health and Safety Officer (Mr Ciaran Conneely) and a number of other PIs whose research teams are the main laboratory users. PIs/lab heads will timetable activities within the designated shifts, and will be responsible for notifying the Health and Safety Officer of any change or breach in plan.

- The Return to Work Committee chaired by the Deputy Director of TCIN and the TCIN Safety Officer will have overall responsibility for the management and implementation of Return to workplace plans. PIs/lab heads and researchers are expected to play a pro-active role.
- Each day will be divided into 2 shifts of 5 hours each i.e. from 8am to 1pm and from 2pm to 7pm. The working week will be 6 days (Monday to Saturday). Therefore, each researcher may be allocated up to 6 periods of laboratory time each week. Longer access hours will be considered if needed but will be allocated based on priority and need and must be fully justified. The TCIN administration offices will be operating remotely and any requests should be emailed to the relevant contact. TCD Mail services in the Lloyd building are operational with mail delivered to the administration outer office (3.05). Courier services should be avoided or minimised and may have to operate from the Lloyd building attendants desk (with permission on a case by case basis) or parcel motel (if couriers will not call to an office).
- The TCIN Safety Officer or Deputy Director TCIN will liaise with Estates & Facilities and any Building User Group established to manage the safe running of the Lloyd building as a whole.

Health & Safety actions / Risk assessment

Based on an analysis of the risks related to resuming laboratory based activities during the COVID-19 pandemic, the following will be implemented:

- The return to the workplace should be agreed and voluntary for both researcher and PI.
- No individuals in the 'very high' risk category for COVID-19 (as defined by HSE guidelines) will be allowed return to campus at this time. Researchers with dependents or housemates in a very high risk category should also not return to work at this time.
- In case of doubt about potential risks of a return to work, medical advice should be sought by the researcher intending to return to work.
- Access will be denied to any individual who: (1) is feeling unwell; (2) has been in close contact with a confirmed or suspected COVID-19 case; (3) is unable or non-compliant with these operational & hygiene procedures. All workers must stay out of TCIN Lloyd building until all symptoms of COVID-19 have cleared following self-isolation.
- All researchers should download the [HSE COVID tracker app](#); over 1m people have downloaded this App so it will hopefully be an effective tool in reducing transmission risk. We are assured it also complies with data protection legislation with data stored locally on the users phone and messages are sent only in the case of a positive case diagnosis that has been in close proximity to the user.
- If a COVID test is positive, you must inform your line manager or the Director of TCIN nominees- Andrew Harkin or Ciaran Conneely. The Director or his nominee is then obliged to report it to College Health at covdinotify@tcd.ie and the TCIN safety officer conneec@tcd.ie for onwards reporting to the E&F duty team at covidresponse@tcd.ie to allow college to monitor and control all cases.

- All researchers will follow relevant government guidelines if they display any of the symptoms of COVID-19, as will those who have been in contact with any person displaying symptoms (i.e. their group members).
- If anyone displays symptoms of COVID-19 they must self-isolate and contact by phone the TCIN health & safety officer. If necessary, these individuals can also **contact the college health service** for further advice. If a researcher with prior access to the workplace should develop symptoms of Covid 19, the work area will be cordoned off for 1 week, a review will be undertaken and appropriate cleaning will be arranged through Estates & Facilities.
- A quarantine area will be established in the TCIN common room, if isolation of an unwell individual is required. Otherwise people should make their own way home with distancing or call the colleges approved taxi service provided by Lynx Taxi at 01- 820 2020. You will have to explain the situation and request a car with a 'screen divider' and arrange payment privately.
- TCIN lab users will be made aware of all measures taken to manage the Lloyd building as a whole. This will be done as part of the return to workplace training that all researchers will have to undertake (online) prior to their return.
- A hand sanitizing station will be available at the entrance to the building.
- Lifts will not be used as a rule and reserved for people with poor mobility or those moving heavy items.
- Stairs use will be designated as either upwards or downwards and agreed with other users of the Lloyd building. In case of Fire Alarm people should naturally leave by the nearest Exit.
- Signage will be in place to advise, remind and assure workers that safety is being taken seriously. Revised and defined cleaning rotas from E&F/Housekeeping or nominated external cleaners will be implemented.
- Mail is to be delivered to and collected from the attendants desk at the Lloyd building entrance (while the current restrictions are in place)
- Use of shared facilities will be minimized where possible and confined to separate working shifts facilitated by locking shared rooms. e.g. toilets on south side of building used in the early shift, toilets on the north side of the building used in the evening.
- Users must wash their hands both upon arrival and upon completion of each research activity. This will be emphasized regularly and communicated with signage at all entrances to the labs and offices.
- Users are only permitted to access TCIN and the Lloyd building to perform lab-related activities. When they have completed their lab work and disinfected their work area, they should leave TCIN immediately. Office work must be carried out from home. The TCIN buddy system will be in place at all times. Also, in accordance with College policy, the SafeZone App will be used when arriving and leaving College.
- Any contact tracing app that might be recommended by College or Government must be used by all TCIN members.

- The lab spaces *will* be divided into work areas to maintain physical/social distancing protocols. See drawings provided in the appendix below. Only one person is permitted to use a work area at any given time (though people who are already living together are exempt from this requirement) and a booking system will be made available.
- The lab room booking system will also function as a contact tracing log.
- Physical distancing (as recommended by HSE) must be maintained during breaks.
- Until further notice, lunch or refreshments should not be consumed in the Lloyd building common areas to prevent social distancing issues. Spar in Westland Row and a number of other businesses are open for lunch takeaway or people can bring something in and eat outside weather permitting.
- Any breaches of safety rules will result in lab privileges being revoked.
- The final 30 minute slot of each block each day will be reserved to allow a safe handover to those working on the next shift (a checklist/SOP will be circulated).
- Access to common areas (e.g. kitchen, sink, coffee machine) and boardroom is not permitted until further notice. Use of office landline phones is not permitted until further notice (except in case of emergencies).
- All work areas and instruments used must be disinfected by the lab user both before commencing and after finishing work activities. This includes disinfecting door handles to all labs used.
- Standard laboratory PPE must be used by all researchers as they would normally do in the course of their work. If mandated by government or the TCIN health and safety officer, the wearing of additional PPE such as masks may also be implemented.
- Public transport should be avoided where possible, especially at peak times due to capacity limitations. General guidance and updates are available on TFI: <https://www.transportforireland.ie/news/covid-19-information/> .

Return to work checklist

- Training will be provided to all returning researchers – the initial training will be the TCD training on Blackboard. This will be followed up by training will be provided by the Safety Officer of TCIN (or nominee) followed by a Q&A session. All lab users must self-certify that they have undertaken this training and records will be maintained by the Safety Officer.
- Place hygiene posters/signage in all laboratories.
- Researchers have been made aware of relevant college/government guidelines in relation to COVID-19 (<https://www.gov.ie/en/campaigns/c36c85-covid-19-coronavirus/>). This includes understanding the requirements of the COVID-19 questionnaire (see appendix D at the bottom of this document).
- At least 3 days prior to returning to work, all workers must complete and return to work questionnaire/form (see appendix 3). Furthermore, all researchers must inform their PI if there are any other circumstances relating to COVID-19, not included in the form, which may need to be disclosed to allow their safe return to work.

- The SafeZone App has been downloaded and installed by all researchers.
- All researchers have downloaded the Microsoft Teams app and are members of the TCIN 'Team', with relevant notifications activated. A weekly working schedule will be posted with access via the Teams app.
- All researchers must follow the TCIN lone working policy and use a buddy system on Whatsapp or similar while in their labs.
- All researchers agree to maintain a daily contacts log whilst in college which can be shared online with co-workers and the Acting TCIN safety officer (Mr Ciaran Conneely) during the phased return to operations. This will supplement the room booking system which will function as the employers contact log.
- All workers are informed of the purpose of the contact log.
- All workers are aware of the instructions to follow if they develop symptoms during work or at home.
- Provide work permits from TCIN Director (if still necessary).
- All health and safety related equipment (e.g. oxygen and fire alarms) will be checked to ensure they are operational.
- Ensure staff and students are aware of who they can report safety concerns to (TCIN Safety Officer Mr Ciaran Conneely and/or TCIN Deputy Director, Prof Andrew Harkin).
- A dedicated set of PPE will be secured for First Aiders. This (in addition to hand sanitiser, masks, wipes etc) will be stored in the TCIN admin office.

Building and site level considerations

- The director of TCIN and the TCIN Health and Safety officer will liaise with the relevant people in the Lloyd building (GBHI/Computer Science/Research Computing/Estates & Facilities) to ensure all building level requirements are being addressed. TCIN members will follow all building level instructions on how access/egress will be managed and how circulation and common space will be managed.
- It is recognized that a functioning delivery bay (perhaps at the attendant's reception desk) and Hazardous Material Facility in the Smurfit Institute are required for operations to resume in TCIN.

References

¹ <https://www.gov.ie/en/publication/dfeb8f-list-of-essential-service-providers-under-new-public-health-guidelin/#professional-scientific-and-technical-activities>

² <https://www.gov.ie/en/news/58bc8b-taoiseach-announces-roadmap-for-reopening-society-and-business-and-u/>

³ <https://www.safezoneapp.com/>

Phase 2: Resumption of Research at the Electroencephalography (EEG) Facility.

In Phase 2, TCIN will resume operations in its EEG facility. While maintaining the same governance and safety protocols outlined in phase 1, below we outline a range of additional considerations and protocols that Phase 2 will necessitate.

Background

EEG recordings provide a valuable noninvasive method for measuring human brain activity related to perception, cognition, emotion, and action. They play a major role in efforts to understand, diagnose, and treat a variety of neural and psychological conditions that cause enormous human suffering. However, EEG recordings ordinarily require close contact between an experimenter and the research participant, and they therefore create a risk of spreading the SARS-CoV-2 virus that is responsible for the COVID-19 pandemic that began in late 2019. Consequently, most EEG research was paused during the first stages of this pandemic.

A long pause in EEG research could cause a significant delay in the development of diagnostic tools and new treatments for a variety of conditions that produce significant human suffering, especially if this pause causes trainees and early career researchers to leave the field. This is true even for basic science studies of fundamental neural and psychological mechanisms that are not designed to address a specific mental or physical health condition; these studies will provide the scientific backbone for future preclinical and clinical research focused on diagnosis and treatment. The history of science shows that it is difficult to predict which basic science studies will ultimately lead to important applications, so good science is important even when it is not directed at specific applications.

The EEG facility at TCIN is an important and highly productive research resource that is currently used by multiple investigators and their teams. This includes research staff and students (PhD and MSc), whose research is dependent on data collection via direct human contact. Many of these researchers are due to finish contracts and studentships between September 2020 and March 2021, and thus urgently require laboratory access to complete their projects. Further data collection is also required in order for several PIs to deliver on their commitments to grant funding agencies. Thus, it is important for researchers to resume EEG recordings as soon as the recording procedures can be made sufficiently safe for the research personnel and the research participants. Acknowledging the higher risk to staff and members of the public who participate in research requiring direct human contact, this document aims to provide a set of procedures to best mitigate risk of COVID transmission when undertaking this type of research.

Description of Research Facility

The facility covered by this document is the EEG suite situated on the upper basement (Room UB01) of the Lloyd Building and operated by the Trinity College Institute of Neuroscience (see **Figure 1** for floorplan). It can be accessed from the foyer by one of two flights of stairs and two corridors starting from opposite sides of the building. As outlined in the Phase 1 procedures above, a one-way system is already in operation in the building to facilitate social distancing. Lifts are also available on both sides of the building for access/egress to the EEG facility but staff and participants are instructed to only use them if they have mobility issues. Swipe access is necessary in order to access the floor on which the EEG facility is located and this access was withdrawn from TCIN staff following the COVID shutdown. The EEG facility is divided into a 21/48m² control room and three 5.56m² isolated cubicles. In addition, the EEG facility has a dedicated washroom situated directly across the corridor opposite the entry door to the control room. The washroom contains a large sink with an attached shower head with which participants wash their hair to remove the EEG electrode gel upon completion of testing. Participants typically dry their hair with a towel and/or hair dryer and there is a washer-dryer in the washroom for towel cleaning. The control room area contains desktop computers and EEG equipment as well as several chairs and benches/desks. The control room contains a telephone that can be used for internal (within college) calls only. The EEG cap application and testing takes place in one of three small cubicles in which there is a chair for the participant to sit, a small table on which the EEG recording unit is placed, and a desk on which a computer monitor, keyboard and mouse are positioned in order for the participant to perform the experimental test. A head rest is also positioned on the table on which the participant rests their chin in order to maintain a stable head position throughout testing. There is a single door for access/egress to

the EEG control room and a single door for access/egress to each testing cubicle. The EEG facility is exclusively used for research purposes and each testing session is booked in advance using TCIN's online booking system. Toilet facilities are available a short distance down the corridor from the EEG facility.

There are currently 5 PIs, 10 PhD students, 8 MSc students and 4 postdocs who are currently using this facility.

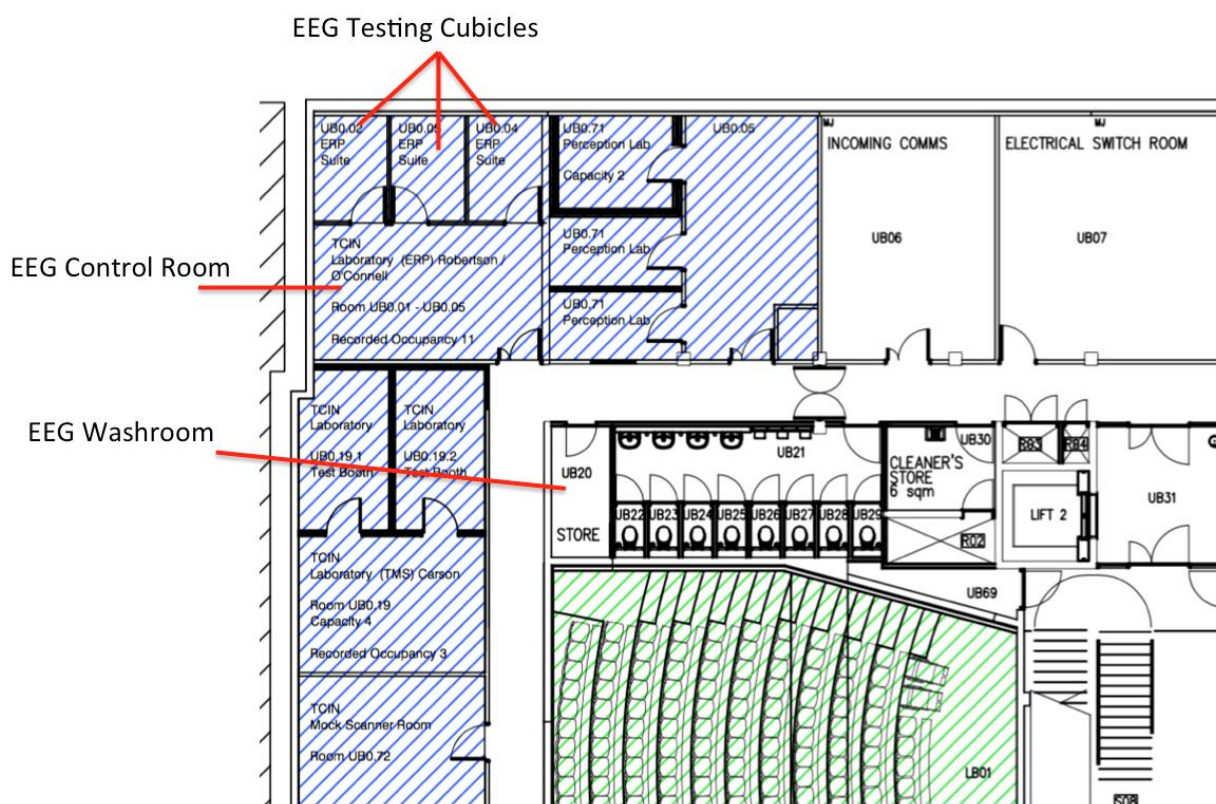


Figure 1. Floor Plan of EEG Facility in the Lloyd Building

Typical Research Activity and Risk Assessment

EEG testing necessitates less than 1 meter proximity between the researcher and participant during the 20-25minute interval required to apply the EEG cap and electrodes. During this time the participant is seated in a chair and the researcher stands behind them in order to A) position the cap on the participant's head, B) apply gel through each of the electrode place holders via a plastic syringe and C) insert the electrodes into the place holders. The researcher remains

standing behind the participant for the vast majority of this time except for a circa 5 minute period during which some study procedures necessitate positioning 4 additional 'external' electrodes around the face area. Once the cap is applied the participant completes the tests in an isolated cubicle while the researcher is positioned in the outer control room. In some cases the researcher may need to briefly enter the control room e.g. in the case of a problem with the testing computer or EEG equipment, where the EEG cables must be detached from the recording unit in order to allow the participant to go to the bathroom, or where certain software commands can only be initiated by the researcher (but these will be avoided where possible). Aside from the EEG cap application procedure, the EEG control room is sufficiently large to allow for social distancing to be maintained between the researcher and participant at all other times. The EEG facility has three isolated testing booths (each can be independently booked using the online booking system) which under normal circumstances would allow three participants to be tested simultaneously but social distancing could not be reliably maintained in the control room area with more than 2 people present. The control room and EEG cubicles are ventilated via an air handling system (same as those throughout the Lloyd building).

Overall, we conclude that EEG testing represents a medium-risk activity due to the necessity for close contact between researcher and participant during a circa 20-25 minute interval.

New Safety Procedures

Key Elements

In order to minimise the risk of virus transmission, the key elements of our revised protocol are as follows:

1. The primary goal is to reduce the expulsion of virus into the air and to remove the virus from surfaces by ensuring that the researcher and participant wear personal protective equipment (PPE) at all times and that all surfaces and equipment are sanitized after each testing session.
2. Maintenance of social distancing between researcher and participant where possible and implement new procedures to minimise duration of contact during application of EEG electrode cap.
3. Both the participant and the researcher will be screened (including temperature check) prior to the recording session, and anyone with COVID-related symptoms or recent contact with a likely COVID-19 case should not enter the lab.
4. All research staff to receive instruction in the use of PPE and protocol for cleaning of the facility and its equipment.

5. Prof Redmond O'Connell (member of TCIN management committee) will coordinate the re-opening of the EEG facility (from here-on referred to as 'the EEG Coordinator') and liaise with TCIN's return to work committee and the TCIN Health and Safety Officer.

6. All face-to-face EEG research activities will require approval from the relevant ethical review board. Projects with pre-existing approval will require amendments to those approvals outlining these new COVID-related procedures and considerations.

Participant Recruitment

Existing study inclusion/exclusion criteria will be updated to exclude any members of the public deemed high risk according to HSE guidelines (e.g. those aged over 60 or with history of heart disease or lung conditions) <https://www2.hse.ie/conditions/coronavirus/people-at-higher-risk.html>

Participants will also be asked to carefully consider their participation if they are likely to be in contact with individuals (e.g. family members) who are at high-risk. Additional information regarding pre-trial COVID screening (Appendix 4 – note this screening questionnaire is more rigorous than that used for Phase 1 operations due to the additional risks associated with face-to-face testing), social distancing and PPE procedures (see below) will be added to all participant information leaflets and provided to the participant in advance of the test day either via e-mail or telephone. Researchers will be encouraged where possible to recruit close contacts (e.g. family members) and other laboratory team members in the first instance before reaching out to members of the general public.

Researcher and Participant Screening

- The researcher will contact the participant one day prior to the scheduled testing, to complete a COVID-19 symptom questionnaire (**Appendix 4**) by phone establishing whether or not the study participant is free of any COVID-19 symptoms and whether or not they have been in recent contact with a known COVID-19 case. Testing will only proceed if the participant confirms that they are free of COVID-19 symptoms or recent contact with a case.
- The research staff member will also complete the COVID-19 symptom questionnaire, take their own temperature and log in to the SafeZone app (**Appendix 5**) on the day of testing. If a research staff member shows symptoms of COVID-19, he/she will isolate immediately and contact the relevant health care for follow up (GP, or College Health). The testing will only proceed if there are other research staff members without COVID-19 symptoms who have not been in contact for a minimum of 7 days with the 'COVID-19 questionnaire' positive staff member.
- The participant will repeat the COVID-19 questionnaire in the EEG facility on the day of testing. The temperature of the study participant will be taken and recorded via an infrared thermometer. If it is suspected that any of the persons have been exposed to COVID-19, or the temperature of anyone is high (37.5C and above), the testing will not proceed, the study

participant and research staff will have to leave, and everyone will have to contact the appropriate medical personnel (GP, College Health or HSE) for follow-up (see **Figure 2**). If a participant or researcher is unwell enough not to be able to return home by themselves, they should be directed to the designated isolation room in TCIN (room 3.02) and their GP or designated emergency contact should be contacted for advice.

Facility Procedures

- Where under normal circumstances, a participant may be attended to by two or more research staff members, only one researcher will interact with the participant in order to minimize the risk of transmission. In addition, where the EEG facility can typically accommodate 3 participant testing sessions at a time, it will now only be possible to test one participant at a time in order to maintain social distancing within the EEG facility.
- To minimise the duration of the testing session, where possible the researcher will administer any additional questionnaires or cognitive tests over the phone or online. The researcher will also prepare all materials necessary for EEG testing in advance of the participant's arrival (prepare tape, gel syringes, caps, computers switched on and ready to go etc).
- As staff card and permission for Estates and Facilities is required to enter the campus, the researcher will meet the participant at the Lincoln Gate entrance to TCD and escort them to the Lloyd Building. The research staff will inform the security personnel at the entrance to institute, that a research study participant is expected. The research staff will arrange with the participant that he/she contact them shortly before arriving, so that they may be met immediately upon their arrival. Participants will be encouraged to avoid using public transport if possible when travelling to TCD.
- The participant will be asked to wear a mask while travelling to the Lloyd building but, to ensure that only high quality masks are worn, the researcher will give the participant a disposable surgical type mask which they will be required to wear upon entry to the Lloyd building and until the time of their departure. A hand sanitiser dispenser is located at the entrance to the Lloyd building at which the researcher will instruct the participant to clean their hands.
- Research staff will also wear a disposable mask or visor at all times and will sanitise their hands immediately before and after their meeting with the participant. From the time of the initial meeting to the conclusion of the testing session, the researcher and participant will maintain a safe distance from each other (recommended distance as per HSE guidelines – currently 2 m) except when EEG cap application and testing necessitates closer contact.
- To minimize contact between study participant and other people, the researcher will first verify that the EEG facility has been vacated by other research staff or participants before bringing in the new participant.

- While maintaining social distancing, the study participant and researcher will proceed to the EEG control room where both will immediately complete the COVID-19 questionnaire.
- The completed questionnaires will be placed in a plastic envelope which will be sanitized and then placed in a locked filing cabinet in the researcher's office.
- The researcher will wear a disposable plastic apron or laboratory coat and surgical mask or visor throughout the testing session.
- To enhance ventilation the entry door to the control room will be left ajar as will the door of the EEG testing cubicle throughout testing.
- As the chin rest in the EEG testing has a soft fabric cushion, a plastic sheet will be placed over it to avoid direct contact with the participant.
- A bathroom with several toilet cubicles is available close proximity to the EEG facility on the same corridor. If participants need to use the toilet they will be accompanied to its entrance door by the researcher and asked to sanitise any surfaces that they touch using the disinfectant wipes available inside. The researcher will also use wipes to sanitise the door handles that they or the participant may touch in transit between the bathroom and EEG facility. In addition, housekeeping clean all bathrooms in TCIN twice per day.
- On completion of testing the researcher will remove the EEG cap. Normally the participant would be taken to the washroom in order to remove the gel from their hair but we will encourage participants if possible to return home to do this. If it is not possible for the participant to return home they will be directed to the washroom. The participant will be given a towel with which to dry their hair and to place it in the washing machine (situated in washroom) after use. When the participant is finished, they will be escorted by the researcher to the TCIN foyer while maintaining social distancing. The participant will apply hand sanitiser and dispose of their mask at the entrance to the building.
- The researcher will then return to the EEG control room and clean all the EEG equipment, testing areas and washroom as indicated in **Appendix 7**. All single use equipment will be disposed of in appropriate biohazard receptacles after use.

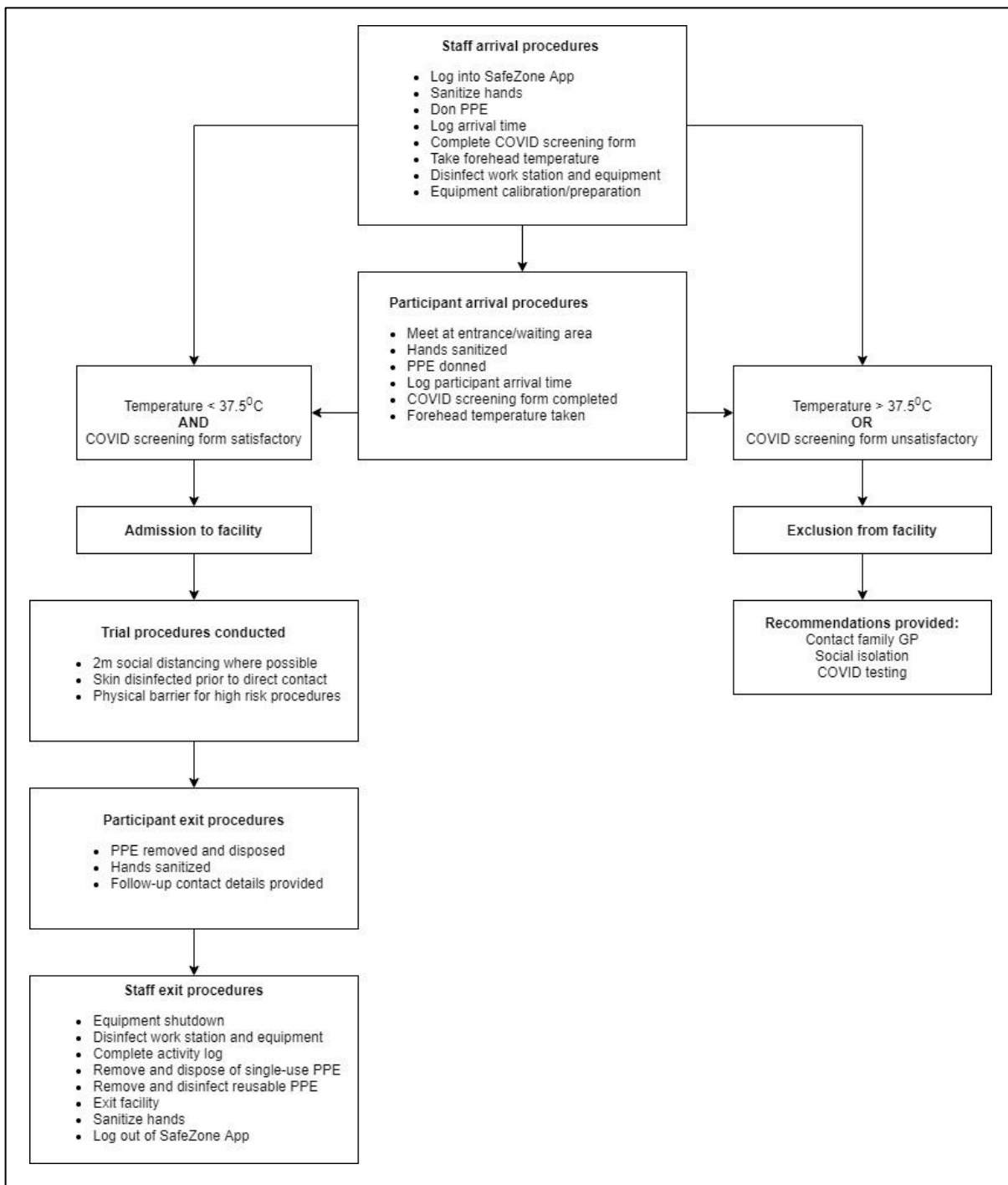


Figure 2. : Logic diagram of staff and participant procedures for human testing

Facility and Staff Scheduling

Researchers will book the EEG facility using the existing online booking system and will be required to reserve the facility for 45 minutes more than would normally be required to allow for preparation of equipment prior to testing and cleaning of equipment and surfaces after testing.

Due to the need for greater flexibility when scheduling meetings with members of the general public, the shift system outlined in Phase 1 of this document will not be implemented for the EEG facility (note that Phase 1 and Phase 4 research will take place on separate floors of the building). Instead, researchers wishing to use the facility will initially contact the EEG Coordinator who will allocate testing days evenly, aiming to ensure that a given researcher can conduct their tests concurrently on a single day of the week – thus minimising the number of time per week that the researcher needs to travel to/from TCIN, minimising the time they spend in TCIN and minimising the number of researchers present at the same time. It will be the responsibility of each PI to source PPE for their research staff.

Facility Activity Log and Checklist

An up-to-date log of activity within the facility will be maintained by research staff using an electronic form stored on the EEG data acquisition computer in the control room (Appendix 6). Each researcher will complete and file an activity log for each laboratory visit. The activity log will document the following for each data collection session:

- Name and contact number of staff member.
- Date and time of arrival of staff member.
- Equipment being used.
- Arrival time of participant.
- Session checklist completed:
- Staff COVID screening form completed (forms stored in study folder)
- Staff temperature measured.
- Work area disinfected prior to onset.
- Protective equipment applied to person and workstation as appropriate.
- Participant COVID screening form completed (forms attached to consent form in study folder).
- Participant temperature measured.
- Protective equipment applied to participant.
- Work area disinfected after use.
- Departure time of participant
- Departure time of staff member.

Research Staff Induction

The principle investigator or lab manager supervising each research facility will ensure that all staff have completed Trinity's online Covid-19 induction training. Each research Covid-19 induction course (Appendix 8) will be completed on blackboard and verification will be returned to EEG coordinator in advance of resumption of activity. Additionally, all staff will confirm that they have read this document and viewed a tutorial provided by the Health Service Executive of Ireland on the correct use of PPE <https://youtu.be/BEbcuqWF-oE> . All PIs wishing to resume EEG research activities will have an induction phone call with the TCIN return to work committee, including the EEG Coordinator, to verify that the researcher has met all of the above requirement, to inform the researcher about the procedures within the Lloyd building including

the one-way system, the need for sanitising all surfaces (e.g. in bathrooms) and the rota system for booking offices. It will be emphasised that individual researchers should not feel under pressure to return to work should they be concerned about the risk of contracting the virus and/or of passing it on to other individuals. Research staff working under a given PI will be invited to join the Zoom call but can otherwise be induced by the PI afterwards. Once all of the above criteria have been satisfied the EEG Coordinator will contact the TCIN Safety Officer to confirm this and to instruct them to arrange for the researcher to be granted access to the building.

Trial Procedures

The following procedures will be adhered to for all human testing taking place within the designated facilities:

- Staff arrive on site a minimum of 30 minutes prior to arrival of study participant.
- Upon arrival, staff will log into the SafeZone App (Appendix 6).
- Hands will be sanitised upon arrival at the facility and appropriate PPE donned.
- COVID screening form completed and staff temperature taken.
- Arrival time logged.
- Workstation and equipment will be prepared for use .
- Upon arrival, participant will be met at appropriate facility entrance/hold area
- Researcher will supervise hand sanitisation and donning of PPE.
- COVID screening form will be checked and participant temperature will be taken.
- If screening form and temperature are satisfactory, participant will be provided PPE and admitted to the facility.
- If screening form or temperature are unsatisfactory, participant will not be admitted to facility and recommendations regarding social isolation and contact of family GP will be provided.
- Social distancing of 2m between researcher and participant will be maintained throughout protocol, where possible.
- In cases where direct contact is required, skin site will be disinfected prior to contact.
- Upon completion of all trial procedures, participant will be accompanied to the facility exit, PPE will be removed and disposed of, and the researcher will again supervise hand sanitisation.
- Researcher will then disinfect equipment and workstation, complete the activity log for the session, clean and store reusable PPE, dispose of all single-use PPE, sanitize hands before exiting the facility.

Use of 3rd Floor Offices by EEG Facility Staff

EEG facility research staff offices are all located on the 3rd floor and therefore provision is made for access during short periods immediately before and after data collection following identical procedures to those outlined for the 4th Floor. In principle, these offices will only be used by a single researcher at a time who will book the room using a spreadsheet hosted on MS Teams and managed by the EEG Coordinator. However, provision is made for two researchers to be present in an office at a time for a maximum of 15 minutes if face masks are worn.

Phase 3: Resumption of Research using Transcranial Magnetic Stimulation (TMS)

In Phase 3, TCIN will resume research using Transcranial Magnetic Stimulation. While maintaining the same governance and safety protocols outlined in Phase 1, below we outline a range of additional considerations and protocols that Phase 3 will necessitate.

Background

Transcranial magnetic stimulation (TMS) is a non-invasive form of brain stimulation in which a changing magnetic field is used to cause electric current at a specific area of the brain through electromagnetic induction. An electric pulse generator, or stimulator, is connected to a magnetic coil which is placed on the scalp. The stimulator generates a changing electric current within the coil which induces a magnetic field; this field then causes a second inductance of inverted electric charge within the brain itself.

TMS has shown diagnostic and therapeutic potential in the central nervous system with a wide variety of disease states in neurology and mental health. Used in conjunction with electromyography (EMG) to record the electrical activity of muscles, it is a valuable measurement tool to test the responsiveness (excitability) of neural pathways connecting the brain's motor cortex to the muscles.

The application of TMS and EMG ordinarily require close contact between an experimenter and the research participant, and they therefore create a risk of spreading the SARS-CoV-2 virus.

At the time of pausing research activities in March due to the pandemic, researchers in TCIN were imminently set to commence a program of experimental testing using TMS equipment on loan from Brainbox Ltd. Two research studies involving healthy adults were planned, forming the basis of preparatory work for a larger study using TMS in the form of a Brain-Computer Interface to facilitate stroke rehabilitation in St. James' Hospital early next year. This equipment was initially intended to remain in TCIN for 3-4 months but has now been there for 6, and no data has yet been collected. A longer pause in this program of research may result in the equipment needing to return to Brainbox Ltd prior to full completion of the study. Additionally, the PI involved has grant funding from two sources (Health Research Board and Enterprise Ireland) that require this data to be collected prior to January 2021 in order to satisfy the terms of the grant. In particular, the Enterprise Ireland funding to conduct one of the studies will only be available to

spend up until the end of December, with no possibility of extension. There are also PhD students involved in this data collection who will rely on these studies in order to remain on track for submission of their theses before their stipend funding runs out.

Thus, it is important for researchers to resume planned TMS experiments as soon as the procedures can be made sufficiently safe for the research personnel and the research participants. Acknowledging the higher risk to staff and members of the public who participate in research requiring direct human contact, this document aims to provide a set of procedures to best mitigate risk of COVID transmission when undertaking this type of research.

Description of Research Facility

The facility currently being used for all TMS research ongoing in the department is Room 3.33 situated on the third floor of the Lloyd Building and operated by the Trinity College Institute of Neuroscience (see **Figure 3** for floorplan). It can be accessed from the foyer by one of two flights of stairs and two corridors starting from opposite sides of the building. As outlined in the Phase 1 procedures above, a one-way system is already in operation in the building to facilitate social distancing. Lifts are also available on both sides of the building for access/egress to the room but staff and participants are instructed to only use them if they have mobility issues. Swipe access is necessary in order to access the third floor and this access was withdrawn from TCIN staff following the COVID shutdown. Room 3.33 has an area of 8.2m² and has an openable window to the outdoors for ventilation. Room 3.33 does not have a dedicated telephone, so researchers are asked to keep their mobile phones within reach in case of emergency, or cross the corridor to the office of the PI which contains a landline phone. In the room there is a chair for the participant to sit, a TMS machine which is on a mobile trolley with shelves containing other devices and a computer, and neuronavigation system positioned on a tall stand in the corner of the room. There are two small desks; one for the EMG recording equipment to sit and another for signing paperwork.

Room 3.33 is exclusively used for research purposes and each testing session is booked in advance using an online booking system. Toilet and hand washing facilities are available a short distance down the corridor.

There are currently 2 PIs, 3 PhD students, 1 MSc student and 2 research assistants planning experiments in this room in the near future.



Figure 3. Floor Plan of Third floor with Room 3.33 outlined in red

Typical Research Activity and Risk Assessment

TMS testing necessitates less than 1 metre proximity between the researcher and participant during A) a preparatory phase for the experiment (approximately 30-45 minutes) and B) for shorter periods (<2 minutes) during the main experiments to position a coil-holding manipulandum.

During preparation for a TMS experiment, experimenters are required to measure the person's head, apply a tight fitting swimming cap, and draw a grid on the surface of the cap in order to aid positioning of the stimulating coil. Skin on the participant's hands and forearms is exfoliated using an abrasive gel and wiped with >70% alcohol prior to the placement of sticky single use electrodes to record EMG from the target muscles. The experimenter then maps their motor region by applying TMS pulses at a range of different locations on the previously drawn grid in order to determine the optimal location to apply TMS during the main experiment (ie. finding their motor 'hotspot' for the target muscles). When the hotspot has been located, its position on the head is digitised using a neuronavigation system. This requires placing a pair of glasses (or headband, whichever the participant finds most comfortable) on the participant's forehead, which contains reflective spheres. The spheres are detected by an infrared camera positioned on a tall stand in the corner of the room. The TMS coil is also fitted with reflective spheres, so the neuronavigation system can digitise the position of the TMS coil relative to the participant's head and provide online feedback for the experimenter to assist with maintaining the optimal position and angle for stimulation throughout the experiment. The process of registering the position of the hotspot also requires the experimenter to use a tool with a long metal spike to touch three landmarks on the participant's head and face (eg. right ear, left ear, bridge of nose), to record their position relative to the reflective spheres worn by the participant.

Following the procedure above to locate and record the position of the motor hotspot, the experimenter applies magnetic pulses at that location at a range of different stimulation intensities in order to determine the minimum intensity necessary to evoke responses reliably in the target muscles (the participant's resting motor threshold).

During the preparation period the participant is seated in a comfortable chair with their arms supported by foam pillows. The researcher stands behind and slightly to the left of them in order to prepare and apply the stimulation over their left motor cortex. The exception is when preparing and placing electrodes on the hand muscles, which normally necessitates the experimenter to stand in front of the participant briefly and touch their hands and forearms.

When preparation is complete, during the main experimental recordings the coil will be fixed in position over the scalp using coil-holding manipulanda, to allow the experimenter to stand back from the participant at a 2m distance. The experimenter will monitor the position of the coil on the head on screen via the neuronavigation system, and only step closer to intervene manually if

the position of the participant's head has moved. With this configuration, TMS will be applied during the experiment in short blocks (<10 minutes) separated by rest breaks in which the experimenter will step forward briefly to remove the coil from the head (approx. 5 minutes). During the application of TMS, the participant performs mental tasks while viewing a computer monitor in front of them.

At the end of the experiment, the single use electrodes are removed and disposed of, the swimming cap and neuronavigation apparatus are removed for cleaning, and the participant is escorted out of the facility.

Aside from during the preparation procedure and short time periods (<2 minutes) when positioning the coil-holding apparatus during the main experiments, Room 3.33 is sufficiently large to allow for social distancing to be maintained between the researcher and participant at all other times.

In addition to the openable window to the outdoors, Room 3.33 is ventilated via an air handling system (same as those throughout the Lloyd building).

Overall, we conclude that TMS testing represents a higher risk than the activities presented in the earlier phases of this document due to the necessity for close contact between researcher and participant during a circa 30-45 minute interval during preparation and multiple shorter periods during the main experiments.

New Safety Procedures

Key Elements

In order to minimise the risk of virus transmission, the key elements of our revised protocol are as follows:

1. The primary goal is to reduce the expulsion of virus into the air and to remove the virus from surfaces by ensuring that the researcher and participant wear personal protective equipment (PPE) at all times and that all surfaces and equipment are sanitized after each testing session. The experimenter will wear a visor, disposable mask and gloves, and the participant will be provided with a disposable mask to wear at all times, which they will remove and dispose of themselves when they have left the facility.
2. The window in Room 3.33 will be kept partially open during all experimental testing (ie. not enough to blow infection around the room but enough to provide additional ventilation. When the participant has vacated the room, the window will be opened and the room vacated for at least 30 minutes before the next experiment.

3. Maintenance of social distancing between researcher and participant where possible and implement new procedures to minimise duration of contact during preparation for TMS. Eg. Instructing the participant to carry out their own skin exfoliation with guidance from the experimenter, placing the swimming cap on their own head, and removal of their own electrodes and cap at the end. TMS coil-holding manipulanda will be used as much as possible and coil positioning will be monitored at a distance using the neuronavigation system to allow experimenters to stand at a 2m distance from the participant during testing.
4. Both the participant and the researchers will be screened (including temperature check) prior to the recording session, and anyone with COVID-related symptoms or recent contact with a likely COVID-19 case should not enter the lab.
5. All research staff to receive instruction in the use of PPE and protocol for cleaning of the facility and its equipment.
6. Dr. Kathy Ruddy will coordinate the re-opening of the TMS facility and liaise with TCIN's return to work committee and the TCIN Health and Safety Officer.
7. All face-to-face TMS research activities will require approval from the relevant ethical review board. Projects with pre-existing approval will require amendments to those approvals outlining these new COVID-related procedures and considerations.

Participant Recruitment

Existing study inclusion/exclusion criteria will be updated to exclude any members of the public deemed high risk according to HSE guidelines (e.g. those aged over 60 or with history of heart disease or lung conditions) <https://www2.hse.ie/conditions/coronavirus/people-at-higher-risk.html>

Participants will also be asked to carefully consider their participation if they are likely to be in contact with individuals (e.g. family members) who are at high-risk. Additional information regarding pre-trial COVID screening (Appendix 4 – note this screening questionnaire is more rigorous than that used for Phase 1 operations due to the additional risks associated with face-to-face testing), social distancing and PPE procedures (see below) will be added to all participant information leaflets and provided to the participant in advance of the test day either via e-mail or telephone. Researchers will be encouraged where possible to recruit close contacts (e.g. family members) and other laboratory team members in the first instance before reaching out to members of the general public.

Researcher and Participant Screening

- The researcher will contact the participant one day prior to the scheduled testing, to complete a COVID-19 symptom questionnaire (**Appendix 4**) by phone establishing whether or not the study participant is free of any COVID-19 symptoms and whether or not they have been in recent contact with a known COVID-19 case. Testing will only

proceed if the participant confirms that they are free of COVID-19 symptoms or recent contact with a case.

- The research staff member will also complete the COVID-19 symptom questionnaire, take their own temperature and log in to the SafeZone app (**Appendix 5**) on the day of testing. If a research staff member shows symptoms of COVID-19, he/she will isolate immediately and contact the relevant health care for follow up (GP, or College Health). The testing will only proceed if there are other research staff members without COVID-19 symptoms who have not been in contact for a minimum of 7 days with the 'COVID-19 questionnaire' positive staff member.
- The participant will repeat the COVID-19 questionnaire in Room 3.33 on the day of testing. The temperature of the study participant will be taken and recorded via an infrared thermometer. If it is suspected that any of the persons have been exposed to COVID-19, or the temperature of anyone is high (37.5C and above), the testing will not proceed, the study participant and research staff will have to leave, and everyone will have to contact the appropriate medical personnel (GP, College Health or HSE) for follow-up (see **Figure 2**). If a participant or researcher is unwell, they should be directed to the designated isolation room in TCIN (room 3.02) and their GP contacted for advice.

Facility Procedures

- Where under normal circumstances, a participant may be attended to by two or more research staff members, only one researcher will interact with the participant in order to minimize the risk of transmission. This must be an experimenter who has been granted 'Experienced TMS Operator' status by the School of Psychology ethical committee, and has first aid training. At all times during TMS experiments, a second experimenter will be in a nearby office, and all interceding doors will be ajar to facilitate a call for help. The buddy system will also be utilised, as the second experimenter will check in regularly on the primary experimenter via Whatsapp or text.
- To minimise the duration of the testing session, where possible the researcher will administer any additional questionnaires over the phone or online. The researcher will also prepare all materials necessary for TMS testing in advance of the participant's arrival (prepare electrodes, swimming caps, neuronavigation tools, computers switched on and ready to go etc).
- As staff card and permission for Estates and Facilities is required to enter the campus, the researcher will meet the participant at the Lincoln Gate entrance to TCD and escort them to the Lloyd Building. The research staff will inform the security personnel at the entrance to institute, that a research study participant is expected. The research staff will arrange with the participant that he/she contact them shortly before arriving, so that they may be

met immediately upon their arrival. Participants will be encouraged to avoid using public transport if possible when travelling to TCD.

- The participant will be asked to wear a mask while travelling to the Lloyd building but, to ensure that only high quality masks are worn, the researcher will give the participant a disposable surgical type mask which they will be required to wear upon entry to the Lloyd building and until the time of their departure. A hand sanitiser dispenser is located at the entrance to the Lloyd building at which the researcher will instruct the participant to clean their hands.
- Research staff will also wear a disposable mask or visor at all times and will sanitise their hands immediately before and after their meeting with the participant. From the time of the initial meeting to the conclusion of the testing session, the researcher and participant will maintain a safe distance from each other (recommended distance as per HSE guidelines – currently 2 m) except when the procedures necessitate closer contact. TMS coil-holding manipulanda will be used and monitored using the neuronavigation system to allow experimenters to stand at a 2m distance from the participant during testing.
- To minimize contact between study participant and other people, the researcher will first verify that Room 3.33 has been vacated by other research staff or participants before bringing in the new participant.
- While maintaining social distancing, the study participant and researcher will proceed to Room 3.33 where both will immediately complete the COVID-19 questionnaire.
- The completed questionnaires will be placed in a plastic envelope which will be sanitized and then placed in a locked filing cabinet in the researcher's office.
- The researcher will wear a disposable plastic apron or laboratory coat and surgical mask or visor throughout the testing session.
- To enhance ventilation the entry door to the room will be left ajar, as will the entry door to the small corridor on which Room 3.33 is located.
- Four bathrooms each with toilet and hand washing facilities are available a short walk away from Room 3.33. If participants need to use the toilet they will be accompanied to its entrance door by the researcher and asked to sanitise any surfaces that they touch using the disinfectant wipes available inside. The researcher will also use wipes to sanitise the door handles that they or the participant may touch in transit between the bathroom and Room 3.33. In addition, housekeeping clean all bathrooms in TCIN twice per day.
- On completion of testing the participant will be provided guidance for removing their own EMG electrodes from their arms and hands, and removing the swimming cap and neuronavigation apparatus. When the participant is finished, they will be escorted by the

researcher to the TCIN foyer while maintaining social distancing. The participant will apply hand sanitiser and dispose of their mask at the entrance to the building.

- The researcher will then return to Room 3.33 and clean all the TMS, EMG and neuronavigation equipment, testing areas and washroom as indicated in **Appendix 9**. All single use equipment will be disposed of in appropriate biohazard receptacles after use.

Facility and Staff Scheduling

Researchers will book Room 3.33 using the existing online booking system and will be required to reserve the facility for 45 minutes more than would normally be required to allow for preparation of equipment prior to testing and cleaning of equipment and surfaces after testing.

Due to the need for greater flexibility when scheduling meetings with members of the general public, the shift system outlined in Phase 1 of this document will not be implemented for the EEG facility (note that Phase 1 and Phase 3 research will take place on separate floors of the building). All TMS research being performed in Room 3.33 is overseen by one PI (Kathy Ruddy) who will ensure that each researcher in the team can conduct their tests concurrently on a single day of the week – thus minimising the number of time per week that the researcher needs to travel to/from TCIN, minimising the time they spend in TCIN and minimising the number of researchers present at the same time. It will be the responsibility of each PI to source PPE for their research staff.

Facility Activity Log and Checklist

An up-to-date log of activity within Room 3.33 will be maintained by research staff using an electronic form stored on the data acquisition computer in the room (Appendix 6). Each researcher will complete and file an activity log for each laboratory visit. The activity log will document the following for each data collection session:

- Name and contact number of staff member.
- Date and time of arrival of staff member.
- Equipment being used.
- Arrival time of participant.
- Session checklist completed:
 - Staff COVID screening form completed (forms stored in study folder)
 - Staff temperature measured.
 - Work area disinfected prior to onset.
 - Protective equipment applied to person and workstation as appropriate.
 - Participant COVID screening form completed (forms attached to consent form in study folder).
 - Participant temperature measured.
 - Protective equipment applied to participant.

- Work area disinfected after use.
- Departure time of participant
- Departure time of staff member.

Research Staff Induction

The principle investigator or lab manager supervising each research facility will ensure that all staff have completed Trinity's online Covid-19 induction training. Each research Covid-19 induction course (Appendix 8) will be completed on blackboard and verification will be returned to Dr. Ruddy in advance of resumption of activity. Additionally, all staff will confirm that they have read this document and viewed a tutorial provided by the Health Service Executive of Ireland on the correct use of PPE <https://youtu.be/BEbcuqWF-oE> . All staff will also have an induction phone call with Dr. Ruddy who will verify that the researcher has met all of the above requirements. In addition Dr. Ruddy will inform the researcher about the procedures within the Lloyd building including the one-way system, the need for sanitising all surfaces (e.g. in bathrooms) and the rota system for booking offices. Dr. Ruddy will also emphasise to the researcher that they should not feel under pressure to return to work should they be concerned about the risk of contracting the virus and/or of passing it on to other individuals. Once all of the above criteria have been satisfied Dr. Ruddy will contact the TCIN Safety Officer to confirm this and to instruct them to arrange for the researcher to be granted access to the building.

Trial Procedures

The following procedures will be adhered to for all human testing taking place within the designated facilities:

- Staff arrive on site a minimum of 30 minutes prior to arrival of study participant.
- Upon arrival, staff will log into the SafeZone App (Appendix 6).
- Hands will be sanitised upon arrival at the facility and appropriate PPE donned.
- COVID screening form completed and staff temperature taken.
- Arrival time logged.
- Workstation and equipment will be prepared for use.
- Upon arrival, participant will be met at appropriate facility entrance/hold area
- Researcher will supervise hand sanitisation and donning of PPE.
- COVID screening form will be checked and participant temperature will be taken.
- If screening form and temperature are satisfactory, participant will be provided PPE and admitted to the facility.
- If screening form or temperature are unsatisfactory, participant will not be admitted to facility and recommendations regarding social isolation and contact of family GP will be provided.
- Social distancing of 2m between researcher and participant will be maintained throughout protocol, where possible.

- In cases where direct contact is required, skin site will be disinfected prior to contact.
- Upon completion of all trial procedures, participant will be accompanied to the facility exit, PPE will be removed and disposed of, and the researcher will again supervise hand sanitisation.
- Researcher will then disinfect equipment and workstation, complete the activity log for the session, clean and store reusable PPE, dispose of all single-use PPE, sanitize hands before exiting the facility.

Use of 3rd Floor Offices by staff using Room 3.33 for TMS research

Staff offices of the researchers involved in TMS research are all located on the 3rd floor and therefore provision is made for access during short periods immediately before and after data collection following identical procedures to those outlined for the 4th Floor. In principle, these offices will only be used by a single researcher at a time who will book the room using a spreadsheet hosted on MS Teams and managed by Dr. Ruddy. However, provision is made for two researchers to be present in an office at a time for a maximum of 15 minutes if face masks are worn.

Phase 4: Resumption of Research at the Human Magnetic Resonance Imaging (MRI) Facility

In Phase 4, TCIN will resume operations in its MRI facility. While maintaining the same governance and safety protocols outlined in Phase 1, below we outline a range of additional considerations and protocols that Phase 4 will necessitate.

Phase 4 also outlines further consideration and protocols specific to scanning of adult versus infant study participants as outlined below.

Background

At the start of 2019, a team from the Trinity College Institute of Neuroscience won a 2.5 million Euro SFI Infrastructure Award for a new MRI scanner, Ireland's first state-of-the-art research dedicated MRI for 15 years. The arrival of this machine has been delayed by complexities in the procurement and installation process, and several projects are now on a tight schedule. This includes two projects with substantial budgets: an ERC Advanced Research Award (FOUNDCOG, Cusack) and EU AIMS II, a multi-centre grant. It is imperative for the success of these projects that scanning begin as soon as possible. Another pressing concern is to facilitate the resumption of experimental work for a number of PhD students and Postdoctoral researchers.

Description of Research Facility

The facility covered by this document is the MRI suite situated on the upper basement (Room UB015 and UB016) of the Lloyd Building and operated by the Trinity College Institute of Neuroscience (see **Figure 4** for floorplan). It can be accessed from the foyer by one of two flights of stairs and two corridors starting from opposite sides of the building. As outlined in the Phase 1 procedures above, a one-way system is already in operation in the building to facilitate social distancing. Lifts are also available on both sides of the building for access/egress to the MRI facility but staff and participants are instructed to only use them if they have mobility issues. Swipe access is necessary in order to access the floor on which the MRI facility is located and this access was withdrawn from TCIN staff following the COVID shutdown. The MRI facility is divided into a control room (number 2 indicated in Figure 4) and single large room (number 1 indicated in Figure 4) where magnet is located and where study participants lie for the scanning. In addition, the MRI facility has a toilet situated directly across the corridor opposite the entry door to the control room. The control room area contains desktop computers and associated equipment for control of the stimuli equipment as well as several chairs and benches/desks. The control room contains a telephone that can be used for calls. There is a single door for access/egress to the

MRI control room and a single door for access/egress to the scanner room. The MRI facility is mostly used for research purposes and each testing session is booked in advance using TCIN's online booking system.

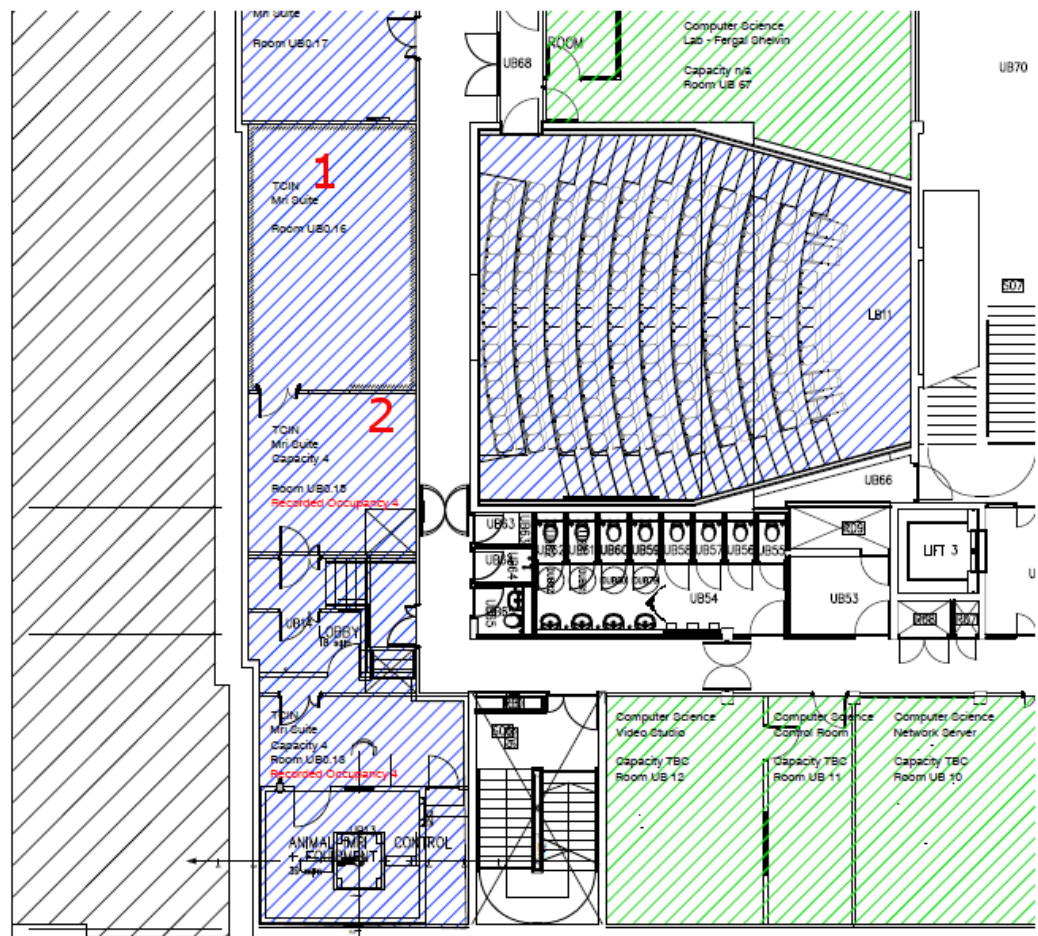


Figure 4. Floor Plan of Human MRI Facility in the Lloyd Building

Safety of Radiographer

- The radiographer will self-monitor every day for COVID-19 symptoms using the Adult COVID-19 Questionnaire. The radiographer should complete the questionnaire at the beginning of the work period. The questionnaire should be completed with a temperature check.
- If any self-monitoring reveals any potential health issues, scanning will be stopped for the day and the radiographer will follow HSE and TCD guidelines for isolation and contacting relevant health care staff such as GP, or HSE testing centre.

Use of 3rd Floor Offices by MRI Facility Staff

MRI facility research staff offices are all located on the 3rd floor (except for some PI offices on 4th floor) and therefore provision is made for access during short periods immediately before and after data collection following identical procedures to those outlined for the 4th Floor. In principle, these offices will only be used by a single researcher at a time who will book the room using a spreadsheet hosted on MS Teams and managed by the MRI Coordinator. However, provision is made for two researchers to be present in an office at a time for a maximum of 15 minutes if face masks are worn.

Participant Recruitment

Existing study inclusion/exclusion criteria will be updated to exclude any members of the public deemed high risk according to HSE guidelines (e.g. those aged over 60 or with history of heart disease or lung conditions) <https://www2.hse.ie/conditions/coronavirus/people-at-higher-risk.html>.

Note: infants and pregnant women are not considered high risk for serious clinical illness if they get coronavirus.

Participants will also be asked to carefully consider their participation if they are likely to be in contact with individuals (e.g. family members) who are at high-risk.

Additional information regarding pre-scanning COVID screening (Appendix 10 – Adult MRI COVID Questionnaire & Appendix 11 – Infant MRI COVID Questionnaire), social distancing, and PPE procedures (see below) will be added to all participant information leaflets and provided to the

participant in advance of the test day either via e-mail or telephone.

Facility and Staff Scheduling

Researchers will book the MRI facility using the existing online booking system and will be required to reserve the facility for 15 minutes more than would normally be required to allow for preparation of equipment prior to testing and cleaning of equipment and surfaces after testing.

Due to the need for greater flexibility when scheduling meetings with members of the general public, the shift system outlined in Phase 1 of this document will not be implemented for the MRI facility (note that Phase 1 and Phase 4 research will take place on separate floors of the building). The PIs and research staff will seek to schedule (as practically as possible) multiple participants in consecutive manner to minimise the number of days a researcher does scanning – thus minimising the number of time per week that the researcher needs to travel to/from TCIN, minimising the time they spend in TCIN and minimising the number of researchers present at the same time. It will be the responsibility of each PI to source PPE for their research staff.

Facility Activity Log and Checklist

An up-to-date log of activity within the facility will be maintained by research staff (appendix 6). Each researcher will complete and file an activity log for each laboratory visit. The activity log will document the following for each data collection session:

- Name and contact number of staff member.
- Date and time of arrival of staff member.
- Equipment being used.
- Arrival time of participant.
- Session checklist completed
- Staff Adult COVID Questionnaire screening completed (forms stored in study folder)
- Staff temperature measured.
- Work area disinfected prior to onset.
- Protective equipment applied to person and workstation as appropriate.
- Participant COVID screening questionnaires (Adult MRI COVID Questionnaire/Infant MRI COVID Questionnaire) completed (forms attached to consent form in study folder).
- Participant temperature measured (including parent/guardian temperature in the case of infant participant)

- Protective equipment applied to participant (infant participants shall not wear a facemask).
- Work area disinfected after use
- Departure time of participant
- Departure time of staff member

Research Staff Induction

The principle investigator or lab manager supervising each research group will ensure that all staff have completed Trinity's online Covid-19 induction training (the PIs are Arun Bokde, Clare Kelly, Rhodri Cusack, Robert Whelan, Richard Reilly, there may be other PIs if/when a study is to begin). Each research Covid-19 induction course (Appendix 8) will be completed on blackboard and verification will be returned to MRI radiographer in advance of resumption of activity. Additionally, all staff will confirm that they have read this document and viewed a tutorial provided by the Health Service Executive of Ireland on the correct use of PPE <https://youtu.be/BEbcuqWF-oE> . All PIs will have an induction phone call with Mr Ciaran Conneely and Prof Andrew Harkin, and the PIs will then lead the induction training for their respective research groups. The PIs will inform the researcher about the procedures within the Lloyd building including the one-way system, the need for sanitising all surfaces (e.g. in bathrooms) and the rota system for booking offices. The PIs will also emphasise to the researcher that they should not feel under pressure to return to work should they be concerned about the risk of contracting the virus and/or of passing it on to other individuals. Once all of the above criteria have been satisfied the PIs will contact the TCIN Safety Officer to confirm this and to instruct them to arrange for the researcher to be granted access to the building. The PIs will also contact the MRI radiographer to confirm the training and to instruct them to arrange for the researcher to be granted access to the MR scanner.

The principle investigator or lab manager supervising each research group will organise a rota within each research group so that only one person is occupying an office at any one time (or two people may occupy an office if they are wearing face masks and they are in the same office for maximum of 15 minutes). If an office is occupied by researchers from two or more labs, the PIs (or lab manager) will coordinate activities among them so that only one person is in an office at any one time (or a maximum of 15 minutes overlap as detailed previously). The researchers are responsible for making the booking to occupy a specific office, as per TCIN requirements. If the Board room is to be used for meeting between study participant and researcher, this room needs to be booked by researcher.

The MRI radiographer will be responsible for overseeing the booking of the MRI scanner and making sure that there are no overlaps between research groups in the use of the facility.

Considerations specific to scanning of Adult Participants:

Typical Research Activity and Risk Assessment (Adult Participant)

MRI testing necessitates less than 1 metre proximity between the researcher and participant at the beginning and potentially at the end of the testing session. The time is necessary to facilitate entry and exit of the participant from the scanner - it requires adjusting pads around the participant's head and providing in some cases small boxes that participants hold in their hands to indicate response while scanning. The study participant will also have an emergency button attached to their shirt during the scanning. Once the participant is comfortable in the scanner, the radiographer (and researcher if necessary) will leave the scanner room and they will sit in the control room. The radiographer and researcher may communicate with the participant through voice communication system and the radiographer can also observe the participant through a video system. The size of the control room is such that social distancing between researcher, radiographer and study participant could not be maintained, so that everyone would have to wear facemasks at all times. The control room and MRI scanner room are ventilated via an air handling system (same as those throughout the Lloyd building).

Overall, we conclude that MRI testing represents a medium-risk activity due to the necessity for close contact between researcher and participant at the start and end of the testing session.

Safety of Study Participants & Research Staff (Adult Participant)

The highest priority will be placed in keeping study participants and staff safe while performing the required tasks for the research projects. The recommendations will entail procedures for safely managing study participants, and cleaning of MR equipment and MR control room.

- All researcher and participants should be asked to download the HSE contact tracing app
- All researchers should download SafeZone for access to TCD
- Before the study participant arrives at the Lloyd building, research staff associated with the research project will contact the participant the day before scanning, to confirm that study participant (and any other people coming with study participant (i.e. parent or legal guardian of participant)) are free of any COVID-19 symptoms. The form will be completed by phone by research staff. The scanning should only proceed if the people coming to institute are free of COVID-19 symptoms.
- The research staff member should inform the study participant to bring a mask without any metal components in it (as best as the participant is able to judge) – so that it is MR

safe. The study participant will be asked to bring a pen for signing and completing forms. If the mask is removed and reapplied, hands must be sanitised.

- There will be a supply of disposable metal free masks in case a participant forgets to bring one (or their mask has metal). The participant will take the mask with him/her after completion of the testing session and dispose outside the building.
- Similarly (to above), the research staff involved in the testing of the participant will complete the questionnaire the day before any testing. If a research staff member shows symptoms of COVID-19, he/she will isolate immediately and contact the relevant health care for follow up (GP, or College Health). The scanning will only proceed if there are other research staff members without COVID-19 symptoms who have not been in contact for a minimum of 7 days with 'COVID-19 questionnaire' positive staff member.
- Study participants and research staff will meet at the security reception at the Lincoln Gate. The research staff will inform the security personnel at the Lincoln Gate, that a research study participant is expected. The research staff will arrange with study participant that he/she contact them shortly before arriving, so that they may be met at the Lincoln Gate.
- Study participants and research staff will disinfect hands at the Infection control station in the Lloyd Foyer and apply masks and disposable gloves, unless it is not possible due to health or other practical reasons (i.e. child under 3).
- To minimize contact between study participant and other people, study participant and research staff will not leave the TCIN foyer to go to the MR suite until the previous study participant (and relevant research staff) have left the room.
- The study participant and any accompanying persons and research staff will complete the COVID-19 questionnaire (see Appendix 10 – Adult MRI COVID Questionnaire) to assess potential exposure to COVID-19. As part of the COVID-19 questionnaire, the temperature of the study participant and research staff will be taken using an IR Forehead thermometer and recorded on form. If the reading is low $\leq 34^{\circ}\text{C}$, the reading should be repeated as it may be an environmental anomaly, the instructions for the forehead thermometer device should be followed in terms of the acclimatisation time required for the participant and for the device to operate accurately. The initial meeting between study participant and research staff will be in a room that can facilitate social distancing (not in MRI control room). The group should proceed to the MR control room only if there are no symptoms of COVID-19.
- The initial meeting will be either in the office of the researcher or the Board room on the 3rd floor that would allow for maintaining social distancing between study participant and researcher. If the initial meeting is to take place in office, researcher will contact the other researchers that share that space so that it is occupied only by the researcher and study participant when the meeting takes place.

- If in the initial meeting (or anytime thereafter) the study participant (or person accompanying participant) develops symptoms of COVID19 and is feeling unwell and is unable to go home by themselves, the person with symptoms will be taken to the isolation room in the Common room. The researcher will call a taxi to take person home (or GP office) or make alternative arrangements if the participant requests.
- The taxi service is special service that may transport potential COVID cases (College taxi service provider is Lynx Taxi, (01)-820 2020, explain the situation and request a 'screen driver' – a car with a divider between passenger and driver compartments)
- The researcher will contact by phone the TCIN Safety Officer to provide information about a potential COVID-19 case.
- The researcher will keep a record of every participant (and any accompanying people) such as name, phone, email and other contact information – this information will be used for contact tracing if it becomes necessary. One copy of this information is to be given to the Radiographer also.
- Access to the MRI area must follow the Lloyd building directional signage and entry is to the right hand side (North) of the building while egress is from the left hand side (South) of the building.
- If it is suspected that any of the persons have been exposed to COVID-19, or the temperature of anyone is high (38C and above), the scan will not proceed, the study participant and research staff will have to leave, and everyone will have to contact the appropriate medical personnel (GP, College Health or HSE) for follow-up.
- Any waiting room area seating must be wipeable and sanitised before and after use.
- The completed questionnaires will be stored by the MR facility in a plastic envelope.
- Only the research staff and radiographer may be in the MR control room during the scanning, with exception of parent or legal guardian (in case of minor or cognitively impaired study participant). Everyone will wear a mask in the control room.
- Study participant will be asked to wear a facemask during scan. If the case he/she does not want to, the facemask will be placed near the scanner (on a table) so that it is easily accessible to study participant after completion of scan. The facemask of the study participant should be checked for any material that is contra-indicated in an MR environment. If the facemask is contra-indicated, the study participant will be provided with one (respective research project will be responsible for purchasing masks).
- The radiographer will wipe and clean the control room and scanner room as indicated in Appendix D.

- Where under normal circumstances, a participant may be attended to by two or more research staff members, only one researcher will interact with the participant in order to minimize the risk of transmission.
- To minimise the duration of the testing session, where possible the researcher will administer any additional questionnaires or cognitive tests over the phone or online. The researcher will also prepare all materials necessary for MRI testing in advance of the participant's arrival such as computer presentation hardware & software, response devices, and stimuli presentation equipment.
- As staff card and permission for Estates and Facilities is required to enter the campus, the researcher will meet the participant at the Lincoln Gate entrance to TCD and escort them to the Lloyd Building. The research staff will inform the security personnel at the entrance to institute, that a research study participant is expected. The research staff will arrange with the participant that he/she contact them shortly before arriving, so that they may be met immediately upon their arrival. Participants will be encouraged to avoid using public transport if possible when travelling to TCD.
- The participant will be asked to wear a mask while travelling to the Lloyd building but, if participant does not have a mask, the researcher will give the participant a disposable surgical type mask which they will be required to wear upon entry to the Lloyd building and until the time of their departure. A hand sanitiser dispenser is located at the entrance to the Lloyd building at which the researcher will instruct the participant to clean their hands.
- Research staff will also wear a disposable mask or visor at all times and will sanitise their hands immediately before and after their meeting with the participant. From the time of the initial meeting to the conclusion of the testing session, the researcher and participant will maintain a safe distance from each other (recommended distance as per HSE guidelines) except when in the MRI control room, and testing necessitates closer contact.
- The initial meeting will be either in the office of the researcher or a testing room on the 3rd floor that would allow for maintaining social distancing between study participant and researcher. If the initial meeting is to take place in office, researcher will contact the other researchers that share that space so that it is occupied only by the researcher and study participant when the meeting takes place.
- While maintaining social distancing, the study participant and researcher will proceed to the MRI control room.
- To minimize contact between study participant and other people, the researcher will first verify that the MRI facility has been vacated by other research staff or participants before bringing in the new participant.
- The completed questionnaires will be placed in a plastic envelope which will be sanitized and then placed in a locked filing cabinet in the researcher's office.
- The researcher will wear a mask or visor throughout the testing session.

- To enhance ventilation the entry door to the control room will be left ajar throughout testing.
- A bathroom with several toilet cubicles is available close proximity to the MRI facility on the same corridor. If participants need to use the toilet they will be accompanied to its entrance door by the researcher and asked to sanitise any surfaces that they touch using the disinfectant wipes available inside. In addition, housekeeping staff clean all bathrooms in TCIN twice per day.

Trial Procedures (Adult Participant)

The following procedures will be adhered to for all human testing taking place within the designated facilities:

- Staff arrive on site a minimum of 30 minutes prior to arrival of study participant.
- Upon arrival, staff will log into the SafeZone App (Appendix 5).
- Hands will be sanitised upon arrival at the facility and appropriate PPE donned.
- Adult MRI COVID screening questionnaire completed and staff temperature taken.
- Arrival time logged.
- Workstation and equipment will be prepared for use.
- Upon arrival, participant will be met at appropriate facility entrance/hold area
- Researcher will supervise hand sanitisation and donning of PPE.
- Adult MRI COVID screening questionnaire will be checked and participant temperature will be taken.
- If screening questionnaire and temperature are satisfactory, participant will be admitted to the facility.
- Contact information will be obtain from the participant (and any accompanying persons) for potential contact tracing purposes and stored. Copy of information will also be given to radiographer.
- If screening questionnaire or temperature are unsatisfactory, participant will not be admitted to facility and recommendations regarding social isolation and contact of family GP will be provided.
- Social distancing (as per HSE guidelines) between researcher and participant will be maintained throughout protocol, where possible.
- Upon completion of all trial procedures, participant will be accompanied to the facility exit, PPE will be removed and disposed of, and the researcher will again supervise hand sanitisation.
- Researcher will then disinfect equipment and workstation, complete the activity log for the session, clean and store reusable PPE, dispose of all single-use PPE, and sanitize hands before exiting the facility.

Considerations specific to scanning of Infant Participants:

Typical Research Activity and Risk Assessment (Infant Participant)

(Note: reference to “researcher” for an infant study may also include the paediatric doctor/nurse as a member of the research team.)

MRI testing necessitates less than 1 metre proximity between the researcher and infant participant at the beginning, at the end of the testing session, and in some rare instances intermittently during a scan. This is necessary to facilitate entry and exit of the infant participant from the scanner, to adjust pads around the participant’s head, to place vacuum cushions, and to provide comfort and warmth (including a blanket). The researcher should wear a facemask at all times and re-apply alcohol gel to hands at all instances. Once the infant participant is comfortable and secure in the scanner, the researcher will be at a distance greater than 2 metres from the infant participant while remaining within the scanner room during the MR scan. This is to allow adjustments to be made to maximise infant participant comfort at any time. The researcher will be able to communicate with the control room staff via a voice communication system in order to receive information regarding the infant’s movements/fussiness and comfort during the scan (in the situation where the paediatric doctor/nurse is the researcher present this communication should include HR and saturations data). The infant will be safety monitored (saturations, heart rate, noise cancelling microphone, and camera visual) from the control room where the paediatric doctor/nurse (if not already the researcher) and radiographer are seated. The size of the control room is such that social distancing between the radiographer and any one staff member (paediatric doctor/nurse or researcher) cannot be maintained, and as a result everyone should wear facemasks at all times. The control room and MRI scanner room are ventilated via an air handling system (same as those throughout the Lloyd building).

In summary we feel that MRI testing represents a medium-risk activity between the infant participant and the researcher, paediatric doctor/nurse and radiographer. This is due to the necessity for intermittent close contact between the researcher and the infant participant and due to the physical size of the scanner and control rooms (facemasks should be worn at all times).

Safety of Study Participants & Research Staff (Infant Participant)

The highest priority will be placed in keeping study infant participants and staff safe while performing the required tasks for the research projects. The recommendations will entail procedures for safely managing infant participants, and cleaning of MR equipment and MR control room.

- All researchers and an infant's parent/guardian should be asked to download the HSE contact tracing app
- All researchers should download SafeZone for access to TCD
- Before the infant participant arrives at the Lloyd building, research staff associated with the research project will contact the parent/guardian the day before scanning, to confirm that the study participant and the parent/guardian are free of any COVID-19 symptoms. The two forms will be completed by phone by research staff. The scanning should only proceed if the people coming to institute are free of COVID-19 symptoms.
- The research staff member should inform the parent/guardian to bring a mask without any metal components in it (as best as the parent/guardian is able to judge) – so that it is MR safe. The parent/guardian will be asked to bring a pen for signing and completing forms. If the mask is removed and reapplied, hands must be sanitised.
- There will be a supply of disposable metal free masks in case a parent/guardian forgets to bring one (or their mask has metal). The parent/guardian will take the mask with him/her after completion of the testing session and dispose of it outside the building.
- Similarly, the research staff involved in the testing of the participant will complete the questionnaire the day before any testing. If a research staff member shows symptoms of COVID-19, he/she will isolate immediately and contact the relevant health care for follow up (GP, or College Health). The scanning will only proceed if there are other research staff members without COVID-19 symptoms who have not been in contact for a minimum of 7 days with 'COVID-19 questionnaire' positive staff member.
- Infant participants, their parent/guardian, and the research staff member will meet at the Lincoln Gate. The research staff will inform the security personnel at the Lincoln Gate entrance that a research study participant is expected. The research staff will arrange with parent/guardian that he/she contact them shortly before arriving, so that they may be met upon arrival.
- Parents/guardians and research staff will disinfect hands at the Infection control station in the Lloyd foyer and apply masks and disposable gloves, unless it is not possible due to health or other practical reasons (i.e. children under 3 years old). Parent/guardian and research staff should remain a safe distance from any other people in the foyer (recommended distance as per HSE guidelines – currently 2 m).
- To minimize contact between an infant participant and other staff, infant study participants, their parent/guardian, and research staff will not leave the TCIN foyer to travel to the MR department until the previous study participant (including their parent and supervising research staff) have already left the MR department.
- The parent/guardian and research staff will complete the COVID-19 questionnaires (see 'Appendix 10 – Adult MRI COVID Questionnaire' and 'Appendix 11 – Infant MRI COVID Questionnaire') to assess potential exposure to COVID-19. As part of the COVID-19 questionnaire, the temperature of the infant participant, the parent/guardian, and

research staff will be taken using an IR Forehead thermometer and recorded on the questionnaire forms. If the reading is low $\leq 34^{\circ}\text{C}$, the reading should be repeated as it may be an environmental anomaly, the instructions for the forehead thermometer device should be followed in terms of the acclimatisation time required for the participant and for the device to operate accurately. The initial meeting between infant participant, their parent/guardian, and research staff will be in a room that can facilitate social distancing (not in MRI control room). The group should proceed to the MR control room only if there are no symptoms of COVID-19.

- The initial meeting will be either in the office of the researcher or the Board room on the 3rd floor that would allow for maintaining social distancing between study participant and researcher. If the initial meeting is to take place in office, researcher will contact the other researchers that share that space so that it is occupied only by the researcher and study participant when the meeting takes place
- If in the initial meeting (or anytime thereafter) the infant/child or person accompanying infant/child develops symptoms of COVID19 and is feeling unwell and is unable to return home by themselves, both will be taken to the isolation room in the Common room. If an adult develops the symptoms, the adult will be taken to the isolation room on his/her own, if there is another adult to take care of the infant/child.
- The researcher will call a taxi to take person home (or GP office) or make alternative arrangements as requested by adult.
- The taxi service is special service that may transport potential COVID cases (College taxi service provider is Lynx Taxi, (01)-820 2020, explain the situation and request a 'screen driver' – a car with a divider between passenger and driver compartments).
- The researcher will contact by phone the TCIN Safety Officer to provide information about a potential COVID-19 case.
- The researcher will keep a record of every participant (and any accompanying people) such as name, phone, email and other contact information – this information will be used for contact tracing if it becomes necessary. One copy of this information is to be given to the Radiographer.
- Access to the MRI area must follow the Lloyd building directional signage and entry is to the right hand side (North) of the building while egress is from the left hand side (South) of the building.
- If it is suspected that any of the persons have been exposed to COVID-19, or the temperature of anyone is high (38°C and above), the scan will not proceed, the study infant participant, the parent/guardian, and research staff will have to leave, and everyone will have to contact the appropriate medical personnel (GP, College Health or HSE) for follow-up.
- Any waiting room area seating must be wipeable and sanitised before and after use.
- The completed questionnaires will be stored by the MR facility in a plastic envelope.

- Only the researcher or paediatric doctor/nurse (not both) and the radiographer may be in the MR control room during the scanning, with exception of the parent/guardian should they so wish (in the case of an infant study participant). Every person present should wear a facemask in the control room.
- An infant participant will not be permitted to wear a facemask during the MR scan. This is to facilitate infant comfort and infant safety. However, the facemask of the parent/guardian should be checked for any material that is contra-indicated in an MR environment. If the mask is contra-indicated, the parent/guardian will be provided with one (respective research project will be responsible for purchasing masks).
- The radiographer will wipe and clean the control room and scan room as indicated in Appendix 12.

Facility Procedures (Infant Participant)

- Only one researcher will interact with the infant participant and their parent/guardian in order to minimize the risk of transmission.
- To minimise the duration of the testing session, where possible the researcher will administer any additional questionnaires or cognitive tests over the phone or online. The researcher will also prepare all materials necessary for MRI testing in advance of the participant's arrival such as computer presentation hardware & software, response devices, and stimuli presentation equipment.
- The research staff will inform the security personnel at the entrance to institute, that a research study participant is expected. The research staff will arrange with the parent/guardian that he/she contact them shortly before arriving, so that they may be met immediately upon their arrival.
- The parent/guardian will be asked to wear a facemask while travelling to the Lloyd building but, if the parent/guardian does not have a mask, the researcher will give the parent/guardian a disposable surgical type mask which they will be required to wear upon entry to the Lloyd building and until the time of their departure. A hand sanitiser dispenser is located at the entrance to the Lloyd building at which the researcher will instruct the parent/guardian to clean their hands.
- Research staff will also wear a disposable mask or visor at all times and will sanitise their hands immediately before and after their meeting with the participant and parent/guardian. From the time of the initial meeting to the conclusion of the testing session, the researcher and infant participant will maintain a safe distance from each other (recommended distance as per

HSE guidelines) except when in the MRI scanner room when infant comfort/safety requires intermittent brief episodes of closer (< 1 metre) contact.

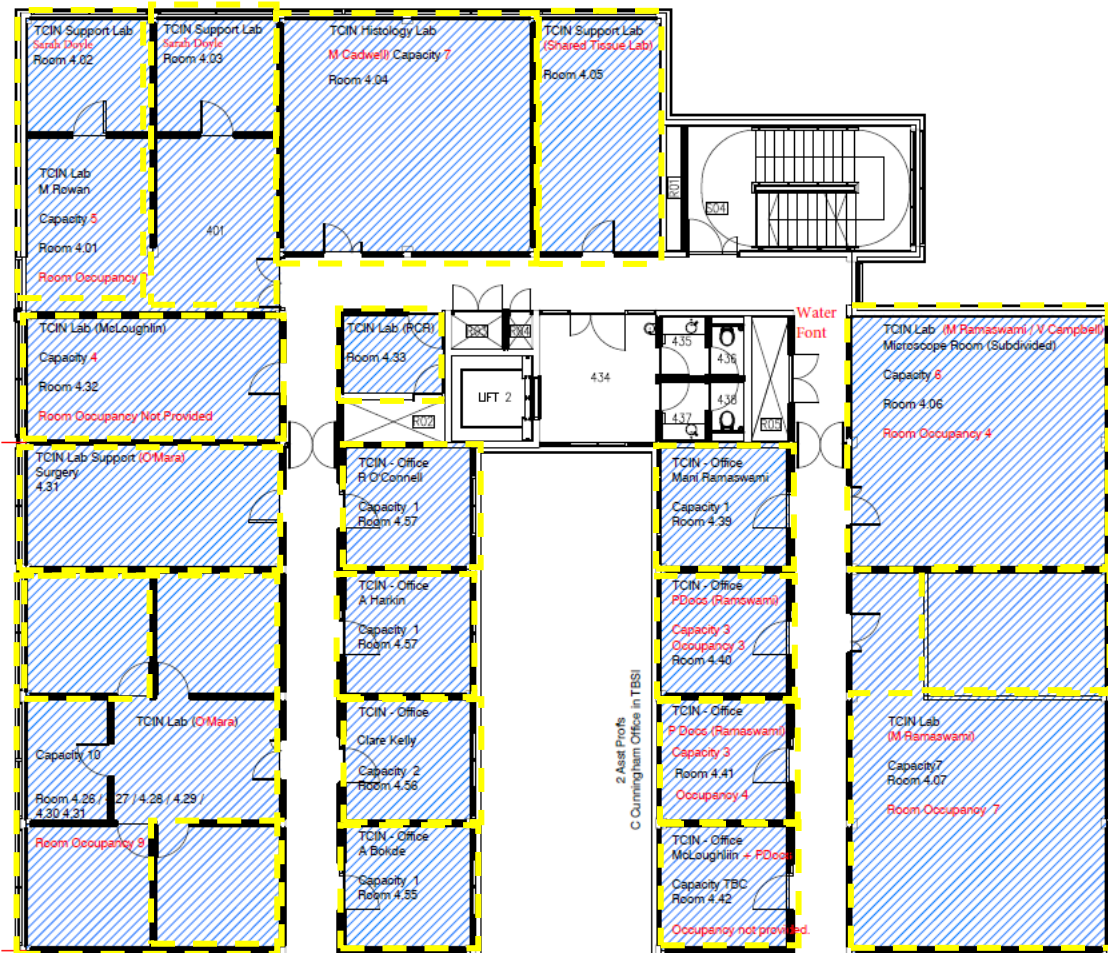
- To minimize contact between the infant study participant, their parent/guardian, and other people, the researcher will first verify that the MRI facility has been vacated by other research staff or participants before bringing in the new infant participant.
- The completed questionnaires will be placed in a plastic envelope which will be sanitized and then placed in a locked filing cabinet in the researcher's office.
- The researcher will wear a mask or visor throughout the testing session.
- To enhance ventilation the entry door to the control room will be left ajar throughout testing.
- A bathroom with several toilet cubicles is available in close proximity to the MRI facility on the same corridor. If a parent/guardian wishes to change an infant's nappy/clothes, or should the parent/guardian want to use the bathroom themselves, they will be shown the bathroom and will be accompanied to its entrance door by the researcher and asked to sanitise any surfaces that they touch using the disinfectant wipes available inside. In addition, housekeeping clean all bathrooms in TCIN twice per day.

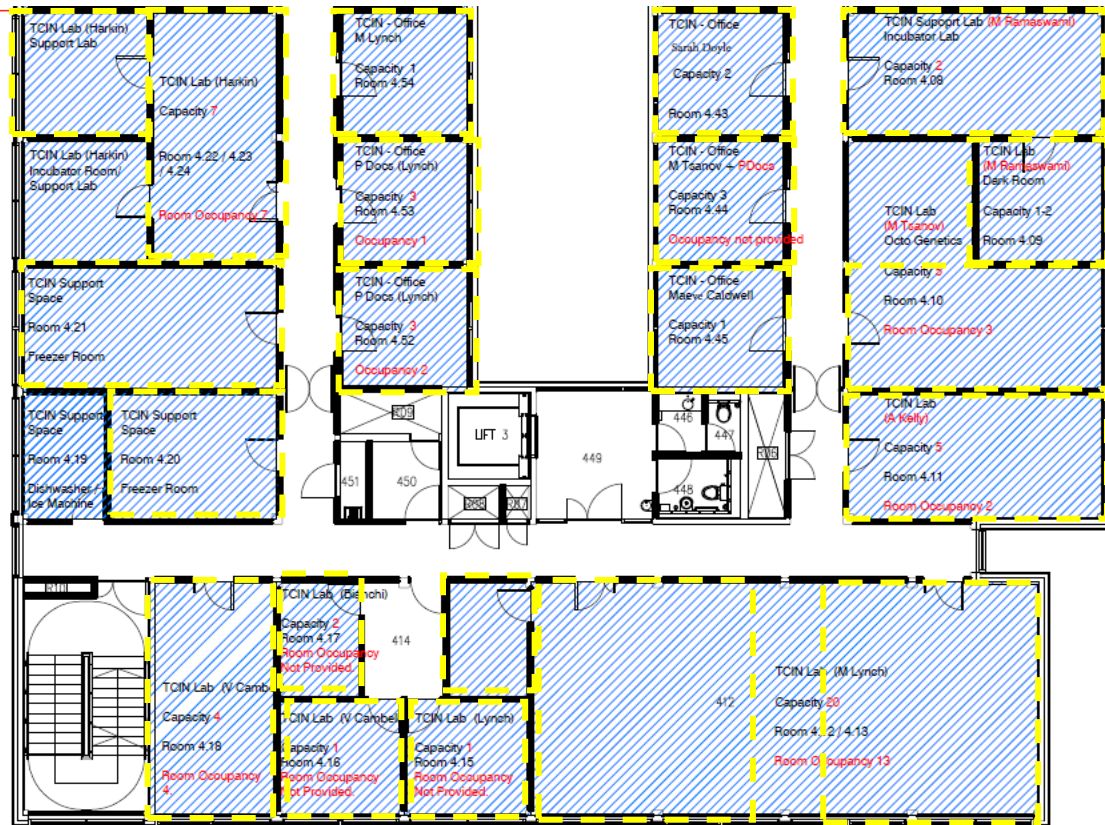
Trial Procedures (Infant Participant)

The following procedures will be adhered to for all infant participant testing taking place within the designated facilities:

- Staff arrive on site a minimum of 30 minutes prior to arrival of infant participant.
- Upon arrival, staff will log into the SafeZone App (Appendix 5).
- Hands will be sanitised upon arrival at the facility and appropriate PPE donned.
- COVID screening questionnaire completed and staff temperature taken.
- Arrival time logged.
- Workstation and equipment will be prepared for use.
- Upon arrival, the infant participant and their parent/guardian will be met at appropriate facility entrance/hold area
- Researcher will supervise hand sanitisation and donning of PPE by parent/guardian
- Infant and Adult MRI COVID screening questionnaires will be checked and both infant participant and parent/guardian temperatures will be taken.
- Contact information will be obtained from all visitors for contact tracing purposes (if needed) and stored. Copy of information will also be given to radiographer.
- If screening questionnaires and temperatures are satisfactory, the infant participant and their parent/guardian will be admitted to the facility.
- If screening questionnaires or temperatures are unsatisfactory, the infant participant and their parent/guardian will not be admitted to facility and recommendations regarding social isolation and contact of family GP will be provided.
- Physical distancing (as per HSE guidelines) between the researcher, the infant participant, and their parent/guardian will be maintained at all times except for specific instances such as in the MRI scanner as listed above (see Section: Typical Research Activity & Risk Assessment – Infant Participant).
- Upon completion of all trial procedures, the infant participant and their parent/guardian will be accompanied to the facility exit, PPE will be removed and disposed of, and the researcher will again supervise hand sanitisation.
- Researcher will then disinfect equipment and workstation, complete the activity log for the session, clean and store reusable PPE, dispose of all single-use PPE, and sanitize hands before exiting the facility.

Appendix 1 - Drawings of physical distancing measures Lloyd 4th Floor
 (Restriction of 1 person per each yellow boxed area)





Appendix 2a Detailed Room Usage in TCIN Lloyd 4th Floor (Phase 1)

Room No	PI Group	Activity/Procedure	No of People
4.02	Doyle	Office	1
4.03	Doyle	Tissue culture/analysis	1
4.04	Caldwell	Tissue culture/analysis	1
4.05	Shared	Tissue culture/analysis	1
4.06	Ramaswami	Imaging & Microscopy	1
4.07a	Ramaswami	Fly Prep Room	1
4.07b	Ramaswami	General lab area with fume hood	1
4.08	Ramaswami	Incubator lab	1
4.09	Ramaswami	Dark room	1
4.10	Tamara Boto	General lab area with fume hood	1
4.11	Aine Kelly	General lab area with fume hood	1
4.12	Lynch	General lab area with fume hood	1
4.13	Lynch	General lab area with fume hood	1
4.14	All	Fridge storage	1
4.15	Lynch	Tissue culture/analysis	1
4.16	Campbell	Tissue culture/analysis	1
4.17	TPI Ltd	Odyssey Equipment	1
4.18	Campbell/Ulysses Ltd	General lab area with fume hood	1
4.19	Shared	Ice Room/Dishwasher	1
4.20	Shared	Walk-in Fridge	1
4.21	Shared	ULT Freezers	1
4.22	Harkin	Tissue culture/analysis	1
4.23	Harkin	General lab area with fume hood	1
4.24	Harkin	General lab area with fume hood	1
4.26/4.27	O'Mara	Animal behaviour	1
4.28/4.29	O'Mara	Skinner boxes	1
4.31	O'Mara	General lab area with fume hood	1
4.32	McLoughlin	General lab area with fume hood	1
4.33	Shared	PCR room	1
4.34	Shared	Lift area	1
4.35/4.36	Shared	Male Toilet	1
4.37/4.38	Shared	Female Toilet	1
4.39	Ramaswami	Office	1
4.4	Ramaswami	Group office	1
4.41	Ramaswami	Group office	1
4.42	McLoughlin	Group office	1
4.43	Doyle	PI Office	1
4.44	Tamara Boto	PI Office	1
4.45	Caldwell	PI Office	1

4.46/4.47	Shared	Male Toilet	1
4.48	Shared	Disabled Toilet	1
4.49	Shared	Lift area	1
4.5	Lynch	ERP room	1
4.52	Lynch	Group office	1
4.53	Lynch	Group office	1
4.54	Lynch	PI Office	1
4.55	Bokde	PI Office	1
4.56	Clare Kelly	PI Office	1
4.57	Harkin	PI Office	1
4.58	O'Connell	PI Office	1
	Phase 1	Total researcher's allowed on 4th floor	31

We expect that in Phase 1 no more than 5 PIs will be present at any one time and that following all wet lab experimental procedures all subsequent analysis will be performed at home.

Appendix 2b Detailed Room Usage in TCIN Lloyd 3rd Floor (Phase 2)

Room No	PI Group	Activity/Procedure	Number of People
3.01	O'Mara	Group office	1
3.02	Board room	Board room	1
3.03	Conneely	Admin office	1
3.04	Hewitt/Hume	Admin office	1
3.05/3.06	Oliveira	Admin office	1
3.07	Quarantine	Quarantine (Common room closed)	0
3.08	TPI room	Group office	1
3.09	Harkin/Kelly/Caldwell groups	Group office	1
3.10	Reilly group	Group office	1
3.14	R Byrne/C Kelly	Group office	1
3.21	Rhodri Cusack	PI office	1
3.22	Cusack	Group office	1
3.23	O'Connell	Group office	1
3.24	Newell	Group office	1
3.25	Newell	Group office	1
3.31	Test room	Test room	1
3.32	Test room	Test room	1
3.33	Test room	Test room	1
3.34	Test room	Test room	1
3.35	Test room	Test room	1
3.36a	Bokde	Group office	1
3.36b	Cannon, Doyle, O'Keane, Ulysses groups	Group office	1
3.37	Store	Store	0
3.39	Shared	Male Toilet	1
3.41	Shared	Ladies Toilet	1
3.43	O'Mara	PI office	1
3.44	Byrne	PI office	1
3.45	Newell	PI Office	1
3.46	Dockree	PI Office	1
3.47	Reilly	PI Office	1
3.48	Carson	PI Office	1
3.49	O'Connell	PI Office	1
3.50	Shared	Male Toilet	1
3.52	Shared	Disabled Toilet	1
3.56	McGrath, Gallagher	Shared PI office	1
3.57b	Max Bianci	PI office	1

3.57a	Kathy Ruddy	PI office	1
3.58	Reilly Group	Tech office	1
3.59	O'Keane	PI office	1
3.6	Dockree Group	Group office	1
3.61	Vanneste Group	Group office	1
Total with 1 person per shared lab/office			39
Less PI& Admin office/service areas occupancy			17
Maximum 3rd floor occupancy of researchers Phase 2			22

We expect that in Phase 2 no more than 5 PIs will be present at any one time and that following all experimental procedures all subsequent analysis will be performed at home.

Appendix 2c Detailed Room Usage in TCIN Lloyd Ground floor (Phase 2)

Room No	PI Group	Activity/Procedure	Number of People
0.41	Campbell	Admin office	1
0.42	Naci	PI office	1
0.45	Leroi	PI office	1
0.46	Vanneste	PI office	1
0.47	Romero-Ortuno	PI office	1
0.59	Glynn	Admin office	1
0.60	GBHI Ops	Admin office	1
0.73	Robertson	PI office	1
0.74	Lawlor	PI office	1
0.79	Cotter	Admin office	1
0.80	Whelan	PI office	1
0.81	Trepel	Group office	1
Total with 1 person per shared lab/office			12

Appendix 2D Detailed Room Usage on TCIN Lloyd Ground floor, GBHI area (Phase 4)



Appendix 3 - Return to Work Screening Questionnaire

This must be completed daily, on a self-assessment basis, before accessing the campus or building. If the answer to any of these questions is 'Yes' then you do not have permission to access the building, and you are strongly advised to seek medical advice.

1. Do you have symptoms of cough, fever, high temperature, sore throat, runny nose, breathlessness or flu like symptoms now or in the past 14 days? Yes/No,
2. Have you been diagnosed with confirmed or suspected COVID-19 infection in the last 14 days? Yes/No,
3. Are you a close contact of a person who is a confirmed or suspected case of COVID-19 in the past 14 days (i.e. less than 2m for more than 15 minutes accumulative in 1 day)? Yes/No,
4. Have you been advised by a doctor to self-isolate at this time? Yes/No,
5. Have you been advised by a doctor to cocoon at this time? Yes/No.

Note: This form must be completed at least 3 days prior to return to work.

Emergency Contact List:

Prof. Andrew Harkin, Chair of RTW Committee: AHARKIN@tcd.ie Tel. Ext: 01-8962807

Ciaran Conneely, Safety Officer on RTW Committee: conneec@tcd.ie, Ext: 01-8968493

Delivery contact list:

Elaine Oliveira, OLIVEIEC@tcd.ie

Barbara Hewitt, BHEWITT@tcd.ie

Appendix 4: EEG Research COVID screen questionnaire

COVID Symptom Checklist

Due to the ongoing COVID pandemic, please complete the following symptom checklist and your temperature 24 hours prior to your laboratory visit.

If you answer 'yes' to any of these questions or have a temperature >37.5 C:

1. Do not leave your house
2. Isolate yourself from other household contacts
3. Contact your GP if you are unwell and require medical advice
4. Inform the laboratory that your test visit will need to be rescheduled
- 5.

Name:
Date:

Have you had any of the symptoms in the last 48 hrs?

Symptom	YES/NO
Cough	
Fever	
Shortness of Breath	
Loss of taste/smell	
Sore throat	
Flu-like illness	
Diarrhoea	

Have you visited countries outside of Ireland in the past 14days?	
Are you a close contact of a person who is a confirmed or suspected case of COVID-19 in the past 14 days? (i.e. less than 2metres for more than 15mins accumulative in 1 day)	
Have you been advised by a health professional to self-isolate in the last 14 days?	

Temperature Check (to be completed upon arrival)	
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Appendix 5: SafeZone App Instructions

1. Download the App (details included in the following link):
<https://www.safezoneapp.com/how-it-works>
2. Open the SafeZone app and enter your email (only tcd.ie email addresses will be accepted).
3. Follow prompts to complete registration – see explanation below.
4. Review and accept permissions



- a. **Location** – Select always allow (note this does not mean people can always see you and even though the app has access always, that data is not visible unless you check-in).

“Always allow” is required for check-in to work in the background, which enables you to minimize the app and return to the home screen which reduces battery use.

- b. **Bluetooth** is for alert devices or indoor location (not necessarily required at this point in time).
- c. **Notifications** allows people to reach you with important messages or in an emergency. This should be enabled (your location will not be visible in order for notifications to be sent).
- d. **Motion and Fitness Activity** is NOT about tracking your fitness, it refers to battery life – when the phone is not moving, the app knows not to check your location as frequently!

5.



Complete your profile and set a password. Please note you are not required to provide a profile photo in order to register.

6. Accept Terms of Use. Please take some time to review the SafeZone Privacy Policy at <https://www.safezoneapp.com/privacy-policy> which sets out how your personal data will be processed in compliance with data protection law. If you require further information on data protection compliance at Trinity College and your rights under GDPR please

contact dataprotection@tcd.ie.

7. Once the app is installed, press the menu button (in the top left of the screen) and select settings.

8. Allow automatic check-in.

9. You have now successfully completed the process. If you need assistance, please email support@criticalarc.com or safezone@tcd.ie.

This will automatically check you in when entering College. However, you should check your phone and the SafeZone App to ensure you are checked in. If not, you will manually need to check in by clicking the Check in button at the top right corner. If you are checked in, the App will then look like this:



When you leave the premises, you will automatically be checked out but please check the App to ensure this has happened. If not, please select the Check Out option on the top right hand corner of this screen:

Appendix 6: Lab Activity Log

In order to reduce the risk of COVID transmission within the university, it is essential that appropriate social distancing, hand sanitization and laboratory work practices are adhered to. The following activity log must therefore be completed for each visit to this facility.

Date:	
Staff Arrival Time:	
Staff Departure Time:	

Staff Name:		Staff ID:	
Email:		Phone:	
Equipment Use:			

Staff Checklist:

Item	Completed
Hands sanitised upon arrival	
COVID screening form completed and filed*	
Temperature measured	
PPE applied to person	
Workstation and equipment disinfected	

Participant Checklist:

Arrival Time:		Departure Time:	
Item			Completed
Hands sanitised upon arrival			
COVID screening form completed and filed*			
Temperature measured			
PPE applied to person			

Post-test Checklist:

Item	Completed
Biohazardous waste disposed	
Single-use PPE disposed	

Reusable PPE disinfected and stored	
Workstation and equipment disinfected	
Hands sanitised upon departure	

*Completed staff COVID screening forms should be filed in the lab activity folder. Completed participant COVID screening forms should be stapled to consent forms, filed in the project folder, and locked in the laboratory filing cabinet.

Appendix 7: Procedure for Cleaning EEG Facility

The research staff member conducting the testing session will be responsible for cleaning and disinfecting any equipment and surfaces that the participant and researcher have been in direct or close proximity with will be cleaned after each testing session (including EEG control room, EEG cubicle and EEG washroom), including door handles. Alcohol wipes will be used for cleaning electronic equipment (e.g. keyboards, mouse, computer monitors) while spray disinfectant will be applied to all chairs (note: the chairs in the EEG facility have plastic surfaces) and benches/tables. The research staff member will wear disposable gloves when cleaning & disinfecting surfaces.. The researcher will clean the EEG cap and electrodes following procedures approved by the manufacturer. The EEG caps will be washed in lukewarm water and soap using a soft brush. The electrodes and gel syringes will be submerged in a minimum 70% alcohol solution for 2 minutes. All researchers will be required to watch the instructional video provided by the manufacturer:

https://www.youtube.com/watch?v=-CZx3_tbrYM

Appendix 8: TCD Staff Safety Induction

Return to Work safety' induction is now online (you should complete this before returning to campus), please follow the instructions below in order to access the course:

1. Login to Blackboard via mymodule.tcd.ie
2. In the Module Search box, type in 'Returning to Work Safely' and click on Go.
3. You will see a module called COVID-INDUCTION, click on it.
4. Click on the Enrol button on the left side of the page. (if you can't see the Enrol button, you may need to click on the blue bar to the left of the screen to make it visible.)
5. Click on the Submit button on the bottom right of your page.
6. Your page will then say you have been enrolled. Click on the OK button on the bottom right of the page to access the module.

Appendix 9: Procedure for cleaning Room 3.33 following TMS experiments

The research staff member conducting the testing session will be responsible for cleaning and disinfecting any equipment and surfaces that the participant and researcher have been in direct or close proximity with, including door handles. Alcohol wipes will be used for cleaning electronic equipment (e.g. keyboards, mouse, computer monitors) while spray disinfectant will be applied to all chairs (note: the chairs in Room 3.33 have plastic surfaces) and benches/tables. The research staff member will wear disposable gloves when cleaning & disinfecting surfaces. The researcher will clean the TMS coil, neuronavigation kit, coil holding manipulandum and EMG electrodes following procedures approved by the manufacturer (ie. using Desident CaviCide disinfectant for cleaning). EMG electrode leads that are not single use will be wiped with alcohol and placed in a sealed envelope with the date and time of their last use written on the front. They can be re-used again after 72 hours. This same procedure (ie. placing in a sealed envelope for 72 hours) will also be used for the cloth swimming caps and headband for neuronavigation (as it also contains cloth surfaces).

Appendix 10 - Adult MRI COVID-19 Questionnaire

Name: _____ Date of Birth: _____

Please read the questions carefully and answer to the best of your knowledge. If anything is unclear, please ask the research staff member.

Do you have....	NO	YES
COVID?	<input type="checkbox"/>	<input type="checkbox"/>
Fever or chills?	<input type="checkbox"/>	<input type="checkbox"/>
Cough?	<input type="checkbox"/>	<input type="checkbox"/>
Shortness of breath?	<input type="checkbox"/>	<input type="checkbox"/>
Lost or changed sense of smell?	<input type="checkbox"/>	<input type="checkbox"/>
Lost or changed sense of taste?	<input type="checkbox"/>	<input type="checkbox"/>
Fatigue?	<input type="checkbox"/>	<input type="checkbox"/>
Aches and pains?	<input type="checkbox"/>	<input type="checkbox"/>
Sore throat?	<input type="checkbox"/>	<input type="checkbox"/>
Headache?	<input type="checkbox"/>	<input type="checkbox"/>
Feeling sick or vomiting?	<input type="checkbox"/>	<input type="checkbox"/>
Diarrhoea?	<input type="checkbox"/>	<input type="checkbox"/>
Temperature >38°C?	<input type="checkbox"/>	<input type="checkbox"/>

If you have any of these symptoms, as per HSE advice, you should isolate and behave as if you have the virus. People in your household will need to restrict their movements.

You may need to be tested for the virus, to find out more information, please contact your GP or the HSE.

Signature: _____ Date: _____

If completed by phone, indicate person conducting interview _____

Appendix 11 - Infant MRI COVID-19 Questionnaire

Infant Name: _____ Date of Birth: _____

As the parent/guardian of the above named infant, please read the questions carefully and answer to the best of your knowledge. If anything is unclear, please ask the research staff member.

Does your child have....	NO	YES
COVID?	<input type="checkbox"/>	<input type="checkbox"/>
Fever or chills?	<input type="checkbox"/>	<input type="checkbox"/>
Cough?	<input type="checkbox"/>	<input type="checkbox"/>
Vomiting?	<input type="checkbox"/>	<input type="checkbox"/>
Diarrhoea?	<input type="checkbox"/>	<input type="checkbox"/>
Temperature >38°C?	<input type="checkbox"/>	<input type="checkbox"/>

If your child has any of these symptoms, as per HSE advice, you should isolate with your child, People in your household will need to restrict their movements.

You child may need to be tested for the virus, to find out more information, please contact your GP or the HSE.

Signature: _____ Date: _____

If completed by phone, indicate person conducting interview _____

Appendix 12 - SOP for Disinfection of MR control room and scanner room

The staff member (radiographer) will clean and disinfect any areas that may have been potentially infected by a study participant (and any accompanying person(s)). The areas are to include the MR control room, MR scanner room and scanner, as well as any equipment (magnet) that is in close proximity to study participant.

The research staff conducting the study will be responsible for cleaning and disinfecting any area or equipment he/she was in proximity in the control room. Thus the computer for stimuli presentation, chair and the area around computer will be cleaned and disinfected by the research staff member. The research staff member will wear disposable gloves when cleaning & disinfecting surfaces.

The radiographer will wear disposable gloves when cleaning & disinfecting any surfaces of the scanner or scanner room with an approved soap or disinfectant as recommended by scanner manufacturer.

In regards the scanner itself, after each use the scanner table, coil, gantry and response devices will be disinfected. The sheet on the table will be changed.

The equipment and area around the radiographer (such as console, desk space, chair, pens) will be disinfected by radiographer after a scanning session with a study participant is completed. The chair or areas where study participants placed his/her property before entering scanner room will be disinfected by radiographer.

We will refer to manufacturer's information sheet for appropriate cleaning and disinfection solutions for use on the MRI scanner. On other surfaces and areas, a cleaning and disinfection solution will be used that has been approved for use with COVID-19.

Appendix 13 - TCD COVID-19 RESPONSE PLAN Executive Summary

COVID-19 is within the community and will become part of the college community throughout the coming year. It is important to remember that:

- Outbreaks in Trinity are very likely. Two confirmed cases in the same area constitute an outbreak.
- Asymptomatic transmission is a key risk in the university setting
- Increased cases and outbreaks in Trinity could increase local prevalence
- All staff and students must take all preventative measures to prevent the spread of the virus – as if everyone has the disease and thus is a suspected case.
- Trinity should plan for an increase in cases or an outbreak associated with our buildings
- Effective systems to record and respond to cases, particularly those within accommodation or academic departments, are required to be able to understand where transmission is occurring within the college
- There should be clear plans for communication and encouraging adherence if an outbreak occurs.

In such circumstances, the COVID-19 Response Plan includes the following:

- TCD's system to facilitate rapid testing of suspected cases. This is being managed by the setting-up of an on-site testing facility managed by College Health in consultation with HSE Public Health Department
- TCD's systems to ensure confirmed cases of COVID-19 are urgently followed up in collaboration with HSE Public Health Department.
- TCD's systems to support the public health risk assessment by HSE Public Health Department which will guide outbreak control measures.
- TCD's systems and procedures for taking and retaining contact information¹ on campus to support the public health risk assessment
- TCD's communications and instructions developed to encourage students and staff to download the COVID-19 Tracker App and record² their close contacts³ on a daily basis
- TCD's dedicated spaces provided to isolate confirmed cases and facilities to support students or staff members in self-isolation
- TCD's systems to facilitate public health communications on site. This can be augmented using the SafeZone App.

The COVID-19 Response Plan elaborates on the [Implementation Guidelines](#) should cases of COVID-19 be confirmed on campus. Specifically, it focuses on:

1. Prevention and Protection
2. Outbreak Response Team
3. Detection of potential cases of COVID-19 - Testing pathway
4. Confirmation of COVID-19 and Contact Tracing
5. Public Health Risk Assessment
6. Outbreak Control Measures and Public Health Principles
7. Appendix 1: COVID-19 Roles and Responsibilities
8. Appendix 2: COVID-19 forms for Students and Staff
9. Appendix 3: Legislative role of the HSE Medical Officer of Health

What to do if there is a confirmed case of COVID-19 on Campus is included here

¹ In keeping with data protection and confidentiality requirements

² In keeping with data protection and confidentiality requirements

³ Using the HSPC definition of a close contact

Appendix 14 - TCD COVID-19 RESPONSE Flow Chart

What to do if there is a confirmed case of COVID-19 on Campus

