

## Policy and safety instructions for TMS-fMRI projects

### Policy

1. The MRI secondary users should hold the certificate in First-Aid Course involving seizure management (e.g. [St. John Ambulance](#), [Red Cross](#)).
2. The TMS-fMRI experiment should be conducted from 10:00-17:30, from Monday-Friday.
3. At least 3 MRI secondary users should be present for TMS navigation and handling adverse TMS event.
4. In addition to MRI safety screening, all participants should be screened by TMS safety checklist<sup>1</sup>.
5. Contraindications to MRI examination: Please refer to "[MRI Safety Policy of PolyU Human MRI Lab](#)".
6. Contraindications to TMS:
  - Participants have epilepsy or have ever had a convulsion or a seizure.
  - Participants have ever had a fainting spell or syncope.
  - Participants have ever had head trauma that was diagnosed as a concussion or was associated with loss of consciousness.
  - Participants with hearing problems or ringing in your ears.
  - Participants with any of the followings: cochlear implants, metal in brain, skull or elsewhere in your body (e.g., splinters, fragments, clips, etc.), neurostimulator (e.g., DBS, epidural/subdural, VNS), cardiac pacemaker or intracardiac lines, and medication infusion device.
  - Participants with cardiac disease.
  - Pregnant.
7. The research group will take the responsibility to inform participants the risk of TMS-fMRI techniques and make sure the participant does not have any contraindications to TMS.
8. Prior to the TMS-fMRI experiment, all participants are required to complete a full TMS stimulation procedure at least once.
9. MRI secondary user should measure and record participant's heart rate and blood pressure before and after the experiment to ensure that the experiment does not induce any significant change of physiological status.

### Safety Instructions

Seizure recognition is challenging during MRI experiments. The research group has the responsibility of promptly identifying and reporting any seizures that occur. To ensure participant safety, one MRI secondary user should stay with the participant in the scanner room during the TMS stimulation. He/she is responsible for monitoring the participant visually and reporting any adverse event.

If any of the following conditions are present or reported by participants, the experimental session for that participant will be terminated:

1. A seizure.

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<sup>1</sup> Rossi, S., Hallett, M., Rossini, P. M., & Pascual-Leone, A. (2011). Screening questionnaire before TMS: an update. *Clinical neurophysiology : official journal of the International Federation of Clinical Neurophysiology*, 122(8), 1686. <https://doi.org/10.1016/j.clinph.2010.12.037>

2. Any repeated or jerking movements without change of consciousness during a TMS-fMRI session.
3. Moderate to severe levels of pain when receiving TMS stimulation (Scores in a 10-point visual analogue scale >3).
4. Acute mood changes, such as mania, psychological stress or anxiety, in association with TMS.
5. Any other physical or psychological issue reported by the subject which can be deemed moderate to severe.
6. Radiographer reserves the right to stop the experiment at any time.

In case of any form of medical emergency (e.g. seizure), the MRI secondary user has to call 999 and campus control centre (ext. 7999) immediately while the others stay with the participant. For seizure, the steps below need to be followed:

1. **Stay with the person:** Remain with the person having the seizure until it's over and they have fully regained consciousness. Speak calmly and reassuringly to the person during and after the seizure to help them feel more secure once they regain consciousness.
2. **Ensure safety:** Move any nearby objects that could potentially harm the person during the seizure, such as sharp objects.
3. **Protect their head:** If possible, cushion their head to prevent injury. You can use a soft object like a blanket or a pillow.
4. **Do not restrain them:** Avoid restraining the person during the seizure. Allow the seizure to run its course without trying to hold them down or stop their movements.
5. **Positioning:** If the person collapses, gently roll them onto their side if possible to help clear their airway and prevent choking on saliva or vomit.
6. **Do not put anything in their mouth:** It is not necessary to put anything in the person's mouth during a seizure. Doing so could actually cause harm.
7. **Leave the participant on the scanner patient table during acute seizure** and prevent the participant from falling off the table.
8. **After the seizure:** Once the seizure ends, check for any injuries and provide comfort and support as the person recovers. Be patient as they may feel disoriented or confused after the seizure.
9. **Move the participant out of the scanner room** when the participant fully recovered. Do not move the participant and wait for arrival of first-aid personnel if there is a suspicion of injury.

The MRI secondary user should observe and record what occurred during the seizure, how long it lasted, and if any injury occurred.