

MRI Safety @ Baycrest ~ Rotman Research Institute **Siemens 3Tesla MRI Scanner**

Revised January 25th, 2021

The scanner at Baycrest is a Siemens superconductive 3.0 Tesla Magnetom Prisma^{fit} whole body MR unit ~ installed in December 2020 ~ currently operating Version Syngo MR VE 11E software (January 2021). The magnet has an aperture of 60cm and a weight limit of 440 lbs.

Baycrest operates a dedicated Research magnet with a heavy emphasis on Functional Neuro imaging techniques. Examinations that one may perform in the Clinical arena, where decisions are made on a risk versus benefit analysis do not necessarily apply in this setting.

As a result, our safety contraindications are always based on the benefit to our Research Participant eliminating any issues of risk.

The main areas of concerns are:

- The introduction of ferrous material into the magnetic field ~ The magnet is **always** on, therefore the magnetic field is always present.
- The potential for heating of implanted devices / objects and or disruption of their function.

www.mrisafety.com

- The above website is your information resource for MRI safety, bioeffects and participant management.
- Please always note the MR safe @ 3 Tesla column and **NOT** the 1.5 Tesla column as we operate a 3 Tesla scanner here @ Baycrest.
- Individuals who have been scanned @ 1.5 Tesla may not be eligible to be scanned @ 3 Tesla depending on the make, model and year of implant they have. Please check out the example listed in the link below for IUD's.
http://www.mrisafety.com/list_result.asp?list_description=IUD&list_status=0&manufacture_name=&object_category=0&rows_returned=25&sort_by=list_description&submit_search.x=0&submit_search.y=0

3.0-Tesla MR Safety Information for Implants and Devices

http://www.mrisafety.com/safety_article.asp?subject=144

For a detail list of safety concerns, please refer to the Baycrest 3T MRI safety screening form <http://www.rotman-baycrest.on.ca/index.php?section=507>

The main Contraindications for **MRI Research** Imaging
@ 3 Tesla @ Baycrest

- **Cardiac Pacemaker** ~ Movement of the pulse generator or lead(s); Temporary or permanent modification of the function of the device; Inappropriate sensing, triggering, or activation of the device; Excessive heating of the leads; and Induced currents in the leads.
- **Aneurysm Clip** ~ Certain types of intracranial aneurysm clips (e.g., those made from martensitic stainless steels such as 17-7PH or 405 stainless steel) are an absolute contraindication to the use of MR procedures because excessive, magnetically induced forces can displace these clips and cause serious injury or death.
- **Cochlear Implant** ~ Cochlear implants are electronically-activated devices. Consequently, an MR procedure may be contraindicated for a patient with this type of implant because of the possibility of injuring the patient and/or altering or damaging the function of the device.
- **Pregnancy** ~ Contraindicated by Research ethics
- *Metal in the eye ~ Penetrating metallic eye injury in the past* ~ X-Ray of eyes to rule out foreign body pre MRI ~ require a copy of the Radiologist report for the Orbital X-Rays. Report should indicate **negative** for metallic foreign body, pre MRI.

Frequently asked questions

Braces / Retainers / Dentures / Dental implants

- There are no safety concerns with respect to this list ~ However Braces are a **NO** for fMRI studies ~ the metal artifact generated by the braces will radiate into the frontal, temporal and parietal areas of the brain ~ areas of the brain that functional researchers are interested in.
- Retainers are **OK** as the metal artifact generated by the retainers is confined to the mandibular area.
- Dental implants are for the most part **OK** ~ depending on the amount of implants ~ the artifact is usually confined to the mandibular area.
- Dentures are **OK** ~ removable ~ Denture cups are provided in the suite.

Tattoos ~ An updated survey of the literature indicates that the risk of adverse heating of subjects with tattoos is very small, irrespective of the location of the tattoo. All subjects with tattoos can now be included in research MRI studies. In 2010, Research ethics chair, Dr. Angie Troyer approved the following sentence to be included in your consent forms:

If you have a tattoo, there is a very small possibility that you will feel a tingling or burning sensation at the tattoo site.

You can include this sentence into the paragraph that starts "While all forms of diagnostic medical procedures involve some risk...."

Black eyeliner ~ mascara ~ Remove ~ possible potential for heating ~ possible iron oxide content

Frosted eye shadow ~ Remove ~ possible potential for heating ~ possible iron oxide content

Dark Nail enamel ~ may have to remove from the middle finger for pulse ox placement as it may sometimes interfere in the receipt of a good trace of the pulse.

Colored Contact Lenses ~ Contacts that change the color of your eyes ~ must be removed prior to scanning ~ possible iron oxide content ~ Regular contacts can be worn during the MRI exam.