

Welcome to our April 2019 newsletter, bringing you an update on our most recent and upcoming activities.

New Production of T1/T2 Cardiac Phantoms – Confirm your interest today

Resonance Health will soon be commencing a new batch production of the T1MES Cardiac T1 Mapping and ECV Phantoms. Please register your interest now if you would like to purchase phantoms as part of this production run by contacting us at info@resonancehealth.com and providing your contact details and desired quantity.

What is T1MES?

The T1 Mapping and ECV Standardization Program (T1MES) was developed to explore T1 mapping quality assurance (QA) 1.5 and 3T across numerous CMR centres worldwide. This started with the development and regulatory approval of a phantom.

The T1MES Phantom was originally designed by a team of experts including cardiologists, physicists, engineers and national metrology institutes, led by Prof James C Moon (University College London) and Dr Peter Gatehouse (Imperial College London). As part of this study, Resonance Health manufactured ~70 phantoms in 2015 for distribution to CMR centres worldwide engaged in the T1 Mapping and ECV Standardisation (T1MES) in cardiovascular magnetic resonance programme. Resonance Health has continued to manufacture these phantoms due to continued requests from customers.

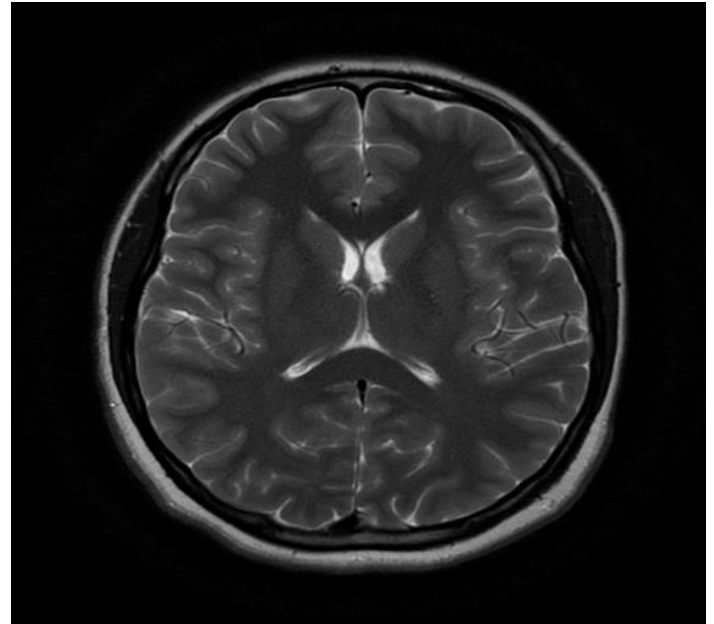
Why use a T1MES phantom?

1. Provides useful reassurance to centres that T1 values are unchanged for any technical reason over long periods of application;
2. Enables some correction to be applied in case a sudden shift in technique is exposed by its regular scanning;
3. Permits systematic inter-sequence and inter-manufacturer analyses, aiming ultimately towards corrections to a 'standard' T1.

For background information on the T1MES program and the efforts involved to deliver T1 mapping to global clinical care, please read the full abstract published at <https://www.ncbi.nlm.nih.gov/pubmed/27660042>.

A look at iron in the brain

As the human brain is tightly regulated to protect against diseases associated with deficiency or excess of iron, there is a growing interest in monitoring and measuring brain iron as a biomarker to assist clinicians in the treatment of their patients.



Sample MRI image of the brain

Iron elevation in the brain is a feature of several major neurodegenerative disorders, such as, Alzheimer's disease (AD), Parkinson's disease (PD), and multiple system atrophy (MSA). Iron-induced dyshomeostasis within vulnerable brain regions is still not fully understood. The involvement of iron in neurodegenerative diseases needs further clarification, but iron overload in the disorders represents an attractive pharmacological target for disease modifying therapies.

Measuring brain iron accurately is complicated by a number of factors including the region of interest (in particular the depth) and the comparatively low levels of iron found in the brain. Resonance Health has developed several MRI imaging and analysis protocols to address the complexity of measuring brain iron at different locations and different levels of iron, and these research-use only tools are now available for use.

To speak to the Resonance Health team about your own brain iron imaging requirements, please feel free to contact us directly at info@resonancehealth.com or call +61 8 9286 5300 during office hours.

Tips to shorten FerriScan® scan time



MRI Measurement of Liver Iron Concentration

At present, the time taken for a FerriScan® should be approximately 7 to 10 minutes (1.5 – 2 min per TE series), depending on the patient's size and shape and the parameter settings used.

In an ongoing effort to help improve the experience of FerriScan® for both hospitals and patients, we have listed below a few recommendations that can help reduce the current FerriScan acquisition time by adjusting the following settings. These settings include:

- **Phase Partial Fourier (PFP):** The scan time can be shortened even further with the application of PFP. Different MRI manufacturers may have different name and setting options. For Siemens scanners, PFP can be selected between 7/8 to 4/8 depending on scanner and software. For Philips scanners, PFP is an option to apply or not. For GE scanners, fractional NEX or NSA will lead to the same effect of PFP for shortening the scan time. **Acquisition Matrix** is the total number of data points in frequency and phase encoding directions. It is recommended to set this parameter to be 256X192 for controlling the scan time.
- **Field of View (FOV):** The FerriScan® scan time is directly proportional to the Phase Field of View (PFOV) size and number of phase encoding steps. A rectangular FOV (smaller size in the Phase direction) will assist in shortening the scan time. Setting 75% PFOV will shorten the scan time by 25%, while additional reduction of the PFOV can shorten the scan time even further depending on the patient's size and shape, provided the patient's complete torso is included within the selected FOV.

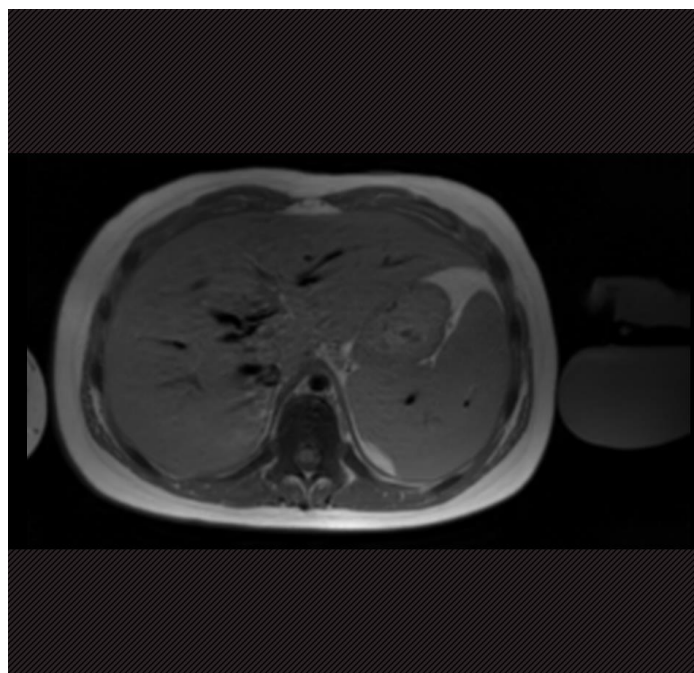
Note: Consistency among different TE series is very important for the FerriScan® protocol. If a parameter setting is changed in a TE series then all the other TE series should apply exactly the same setting. Otherwise, image data may be subject to failure or rescan.

All MRI manufacturers offer this option, however the names may differ slightly among manufacturers. These names include:

- Partial FOV (Siemens)
- Partial FOV (GE)
- Rectangular FOV (Philips)

For Philips scanners, other settings, such as **Voxel Size** and **Reconstruction Matrix**, will need to be changed once a different FOV size is used. Please refer to the FerriScan® Manual for further details.

If you wish to speak to Resonance Health about the FerriScan® protocol and any of the tips mentioned to reduce the overall scan time, please contact Resonance Health at support@resonancehealth.com for any assistance.



Grey highlights area that could be improved with FoV adjustments

Resonance Health has been making significant progress in the Dragon 2 Study, a trial looking at several parameters, including protocols to significantly decrease the acquisition time for the FerriScan® protocol. To date, Resonance Health has obtained data sets from over 85 trial subjects, with data sets containing images collected via several different acquisition protocols of varying scan times.

A shorter acquisition time for the FerriScan® service would not only considerably reduce the time spent by a patient inside an MRI machine, but also lower the total costs to the hospital and patient.

Help us make a difference!

Resonance Health is delighted to announce that we will be participating in this year's "Steps Towards Better Health" challenge for the first time, alongside GenesisCare and founder Perth Radiological Clinic to raise funds for research into diabetes at the Harry Perkins Institute.

Throughout the month of April, Resonance Health personnel will be participating in the Steps challenge by logging their daily steps taken. These steps are recorded over the month via the Get on Track Challenge website, with the daily average steps calculated for each participant.

The Steps program aims to raise funds and promote the work being done by the Harry Perkins Institute and also continue to raise awareness that the small steps we take as individuals can create even bigger steps in our community.

Through the steps taken, the PerthRadClinic Foundation and its affiliated partners pledge to donate the following:

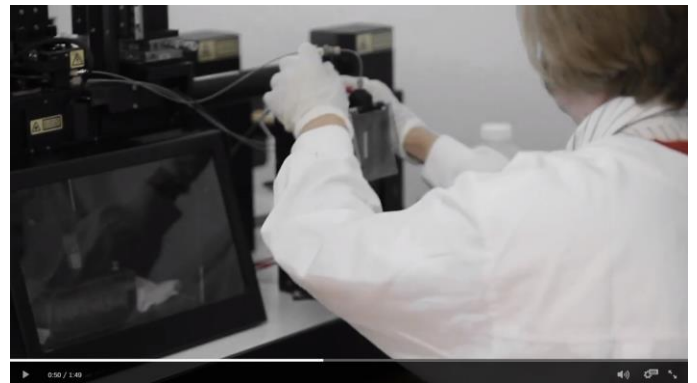
- 1c for each participants averaged daily steps to the Harry Perkins Institute of Research.
- A special group prize for the top highest individual "Team Steppers". This team will be awarded 2 cents per averaged step.

In 2018, Perth Radiological Clinic donated over \$36,000 through the Steps campaign. With participation from GenesisCare and Resonance Health in this years' Steps initiative, we collectively hope to raise over \$50,000 to aid research done by the Harry Perkins Institute.

We hope that by working together with Perth Radiological Clinic and GenesisCare, we can help make a positive impact on the Harry Perkins Institute and their research by supplying much needed funding, and at the same time making a small improvement in our own fitness levels.

If you wish to get involved by sponsorship, we would welcome any and all donations, no matter how small. Please remember that all donations made to the PerthRadClinic Foundation over \$2 are tax deductible. 100% of all funds collected by the PerthRadClinic Foundation will be passed directly onto the Harry Perkins Institute.

To hear more about the Steps initiative and the work done at Perkins, feel free to watch the below video at <https://buff.ly/2YDgWzV> and hear from Harry Perkins Director, Prof Peter Leedman.



To make a donation, please go to the web address at <http://perthrad.clinic/donate> and enter the donation amount or contact prcfoundation@perthradclinic.com.au with how you can help.

