

## FerriScan<sup>®</sup> R2-MRI and Cardiac T2\* Dual Analysis Service

### The liver and the heart in iron overload

Liver iron concentration (LIC) is a good measure of total body iron stores in thalassaemia<sup>1</sup> where high LIC is associated with cardiac iron overload<sup>2</sup>. Once a threshold LIC is exceeded, iron can begin to accumulate in the heart and other organs<sup>3</sup>. Patients with elevated LIC are at greater risk of future cardiac complications and premature death<sup>4,5</sup>.

FerriScan R2-MRI is an accurate method for monitoring LIC, delivering results unaffected by inflammation, fibrosis and cirrhosis<sup>6,8</sup>.

Changes in LIC generally precede changes in heart iron loading<sup>2,3</sup>, acting as an early warning of possible future cardiac complications. An immediate risk of iron-induced arrhythmia and cardiac failure can be assessed by MRI measurement of cardiac T2\*<sup>7</sup>. Iron-induced damage to heart tissue can be halted and reversed if appropriate and timely chelation therapy is commenced.

Regular assessment of body iron overload through the FerriScan and cardiac T2\* Dual Analysis Service enables better informed decisions on the management of patients at risk of iron-induced organ damage.

*“We are using the dual analysis service provided by Resonance Health which provides a complete picture of iron loading in the liver and heart where required. Demand for FerriScan and the Dual Analysis Service is increasing as this has a valuable role in both primary and secondary iron-overload conditions.”*

**Professor Swee Lay Thein**, Professor of Molecular Haematology and Consultant Haematologist at King’s College Hospital and King’s College London (KCL) School of Medicine, London, UK.

### The FerriScan and Cardiac T2\* Service Delivery Model

After the patient is scanned, FerriScan and Cardiac T2\* image data is transmitted securely to the Resonance Health Service Centre for analysis.

Liver Iron Concentration and Cardiac T2\* Reports are made available for download within a target turnaround of two business days.

### Key FerriScan R2-MRI Features:

- ✓ FerriScan provides an accurate, non-invasive, MRI-based measurement of liver iron concentration (LIC)
- ✓ The gold standard for LIC measurement, FerriScan is widely used in clinical trials and routine patient management
- ✓ FerriScan requires only a ten-minute scan. No contrast agent or breath-hold is required
- ✓ FerriScan is charged per scan only and can be established on most 1.5T MRI scanners
- ✓ FerriScan offers high sensitivity and specificity over the range of LIC encountered in clinical practice
- ✓ FerriScan LIC results are unaffected by cirrhosis or fibrosis
- ✓ FerriScan and cardiac T2\* have international regulatory clearance (USA, Europe & Australia)

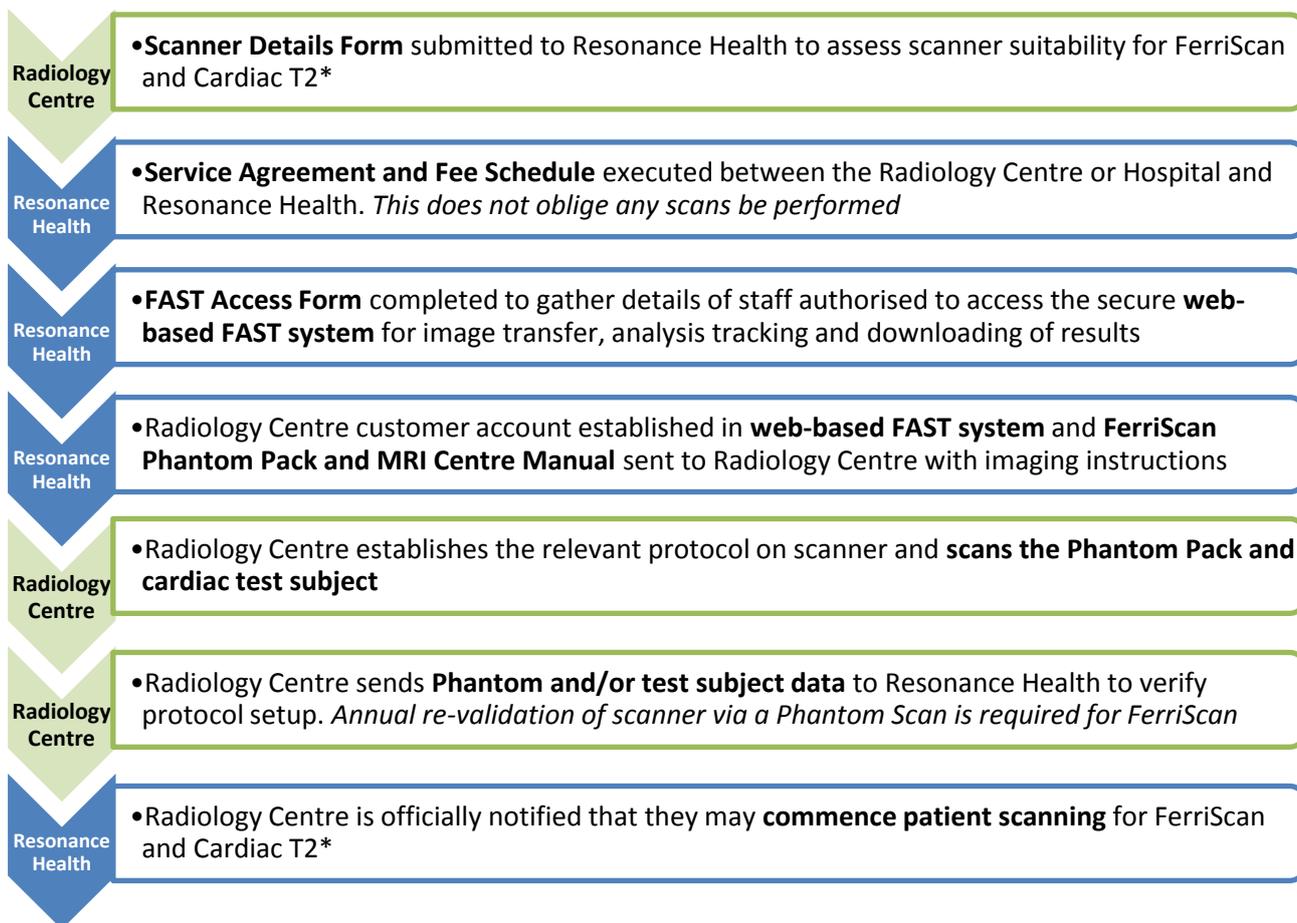
### Key Cardiac T2\* Features:

- ✓ Provides important information for assessing the risk of cardiac failure or arrhythmia
- ✓ Cardiac T2\* is the most widely-accepted MRI-based method for assessing heart iron loading

### Key Dual Analysis Service Features:

- ✓ Provides a more complete picture of body iron loading
- ✓ Standardised, centralised analysis process providing results in two working days
- ✓ ISO 13485 quality assurance

## Establishing the Dual Analysis Service at an MRI Centre



### Technical Requirements for FerriScan

FerriScan requires an approximately 10 minute scan using a single spin echo sequence.

Minimum MRI scanner requirements for the acquisition of suitable data for FerriScan measurement are:

- MRI scanner with a field strength of 1.5 Tesla.  
*FerriScan is currently implemented on a range of scanner manufactured by GE, Philips and Siemens. GE scanners must be operating on Scan Tools 14 or later to be FerriScan-compliant.*
- Single spin echo sequence with a minimum TE of 6.0 ms
- A torso / chest / abdomen receiver coil
- The ability to transfer images to a networked computer with an internet connection

Scanning protocol details and a FerriScan Phantom Pack (scanner validation tool) are provided by Resonance Health.

### Technical Requirements for Cardiac T2\*

Cardiac T2\* requires a single breath hold scan using a multi gradient echo sequence.

Minimum MRI Centre requirements for the acquisition of suitable data for a Cardiac T2\* measurement are:

- Radiology Centre personnel with experience in acquiring cardiac MR images.
- MRI scanner with a field strength of 1.5 Tesla and a cardiac MRI package that includes:
  - RF coil suitable for acquiring cardiac MR images
  - ECG facility
  - Single breath-hold, multi-echo T2\* sequence with:
    - ⊕ Total of 8 echo times
    - ⊕ Minimum TE between 2 and 3 ms
    - ⊕ Maximum TE between 16 and 23 ms
- The ability to transfer images to a networked computer with an internet connection

### References

1. Angelucci E, et al N Engl J Med. 2000; 343:327-41
2. Noetzli LJ, et al Blood. 2008; 112:2973-8
3. Jensen PD, et al Blood. 2003; 101:4632-9
4. Brittenham GM, et al N Eng J Med. 1994; 331:567-73
5. Telfer PT, et al Br J Haematol. 2000; 110:971-7
6. St Pierre TG, et al Blood. 2005; 105:855-61
7. Kirk P, et al Circulation. 2009; 120:1961-8
8. St Pierre et al (2013) Magn Reson Med doi: 10.1002/mrm.24854