FerriScan®

provides an accurate assessment of body iron stores

A clinician's guide to managing transfusional iron overload with FerriScan®

ResonanceHealth

Transfusional iron overload

- Patients receiving multiple blood transfusions are at risk of iron overload
- One unit of red cells delivers approx 250 mg of iron to the body
- The human body has no natural mechanism for excreting iron
- Iron chelation therapy is necessary to prevent iron-related tissue damage

Why is it important to control total body iron stores?

- Free iron (labile iron) causes tissue damage
- Tissue iron deposits are a source of free iron
- The liver is the primary site of iron storage
- If liver iron storage capacity is exceeded, iron is deposited in other tissues of the body including the heart
- Heart failure is the major cause of death in thalassaemia

Goals of iron chelation therapy

- To prevent free iron circulating in the body
- To prevent total body iron stores exceeding limit of total iron binding capacity

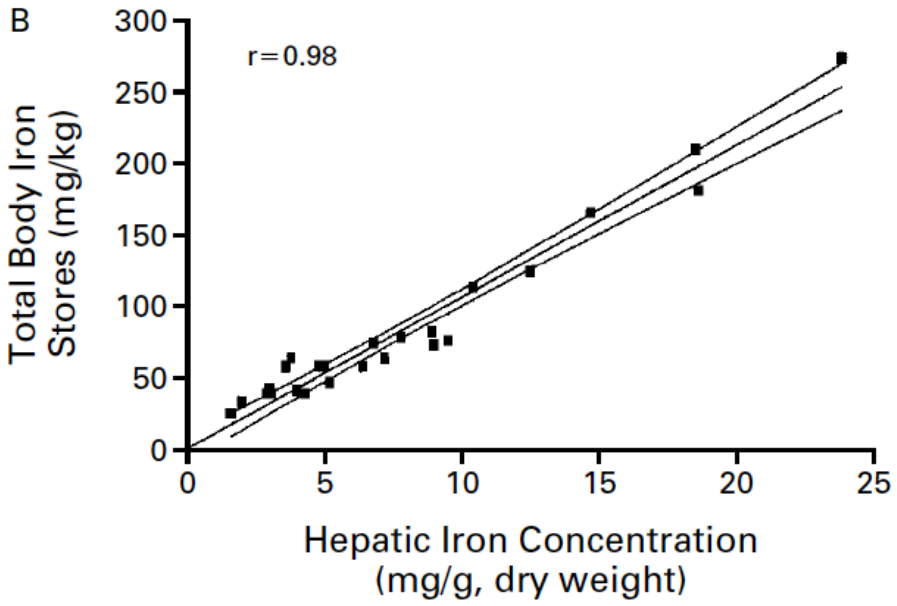
An accurate assessment of body iron stores is required to achieve these goals

Why is measurement of liver iron concentration (LIC) important?

- A patient's LIC value is the best measure of total body iron stores
- A patient's LIC value enables better informed decisions on when to [1]
  - Initiate chelation therapy
  - Increase or decrease chelation dose
  - Change mode of chelator delivery (e.g. iv mode)

[1] Porter et al, Monitoring chelation therapy to achieve optimal outcome in the treatment of thalassaemia. *Best Practice & Research Clinical Haematology* 2002; 15: 329-368

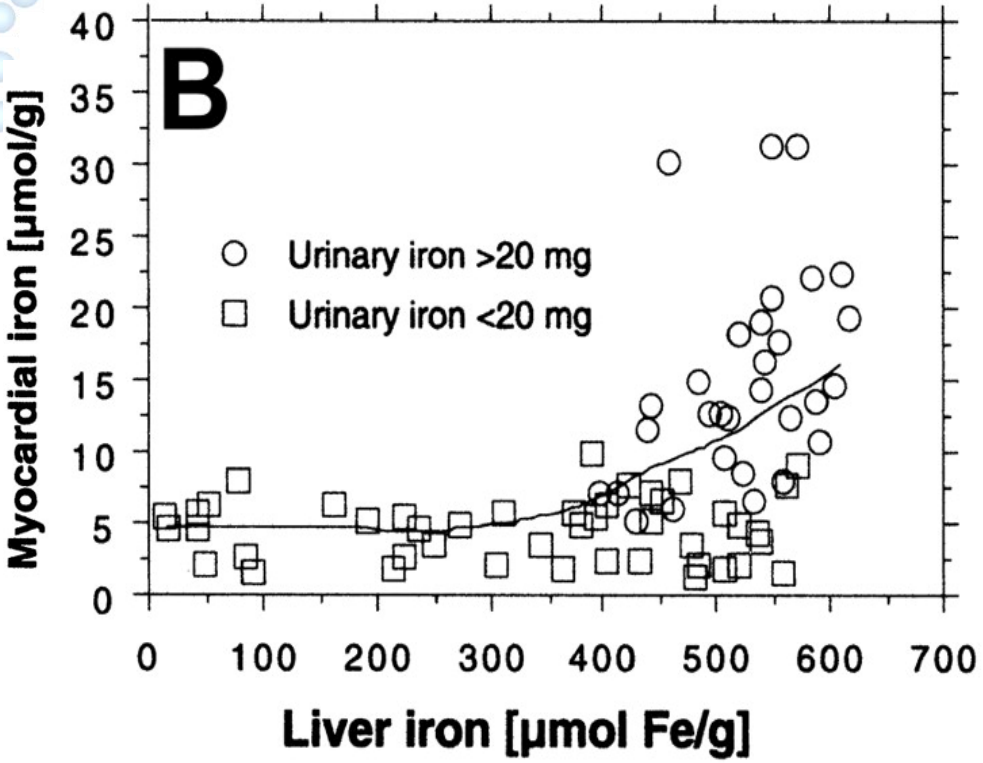
LIC is a reliable measure of total body iron stores



There is a very strong correlation between LIC and total body iron stores in thalassaemia major patients

Angelucci et al. N Eng J Med 2000; 343: 327-31

Relationship between liver and heart iron concentrations

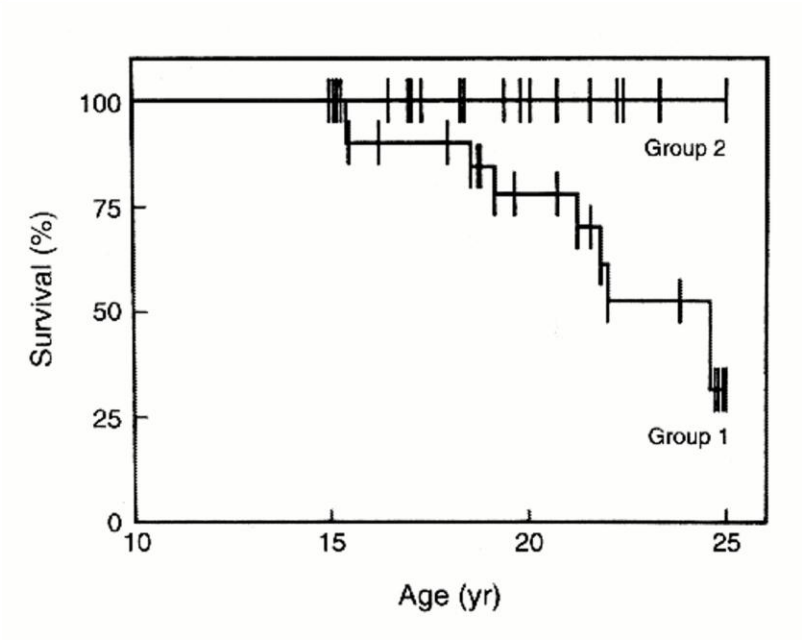


Jensen PD et al. Blood 2003; 101:4632-39

The liver is considered the early warning system against cardiac complication which may result from myocardial iron loading.

- 14 adult non-thalassaemic patients with transfusional iron overload and uncomplicated chelation history
- Iron loading occurred in the liver first
- Once the iron levels in the liver reach a critical level of approx 400µmol Fe/g, then iron loading occurred in the heart

Survival directly related to effective chelation therapy



Life-Table analysis of the 38 patients in Groups 1 and 2 who were 15 years of age or older at final evaluation.

- Group 1: high pretreatment iron load and **ineffective** chelation
- Group 2: high pretreatment iron load and **effective** chelation or low pretreatment iron load
- Of patients with an LIC value available, those who died or had heart disease (n=11) had an LIC value > 15 mg/g dry weight

Brittenham GM, et al. New Engl J Med. 1994;331:567-73.

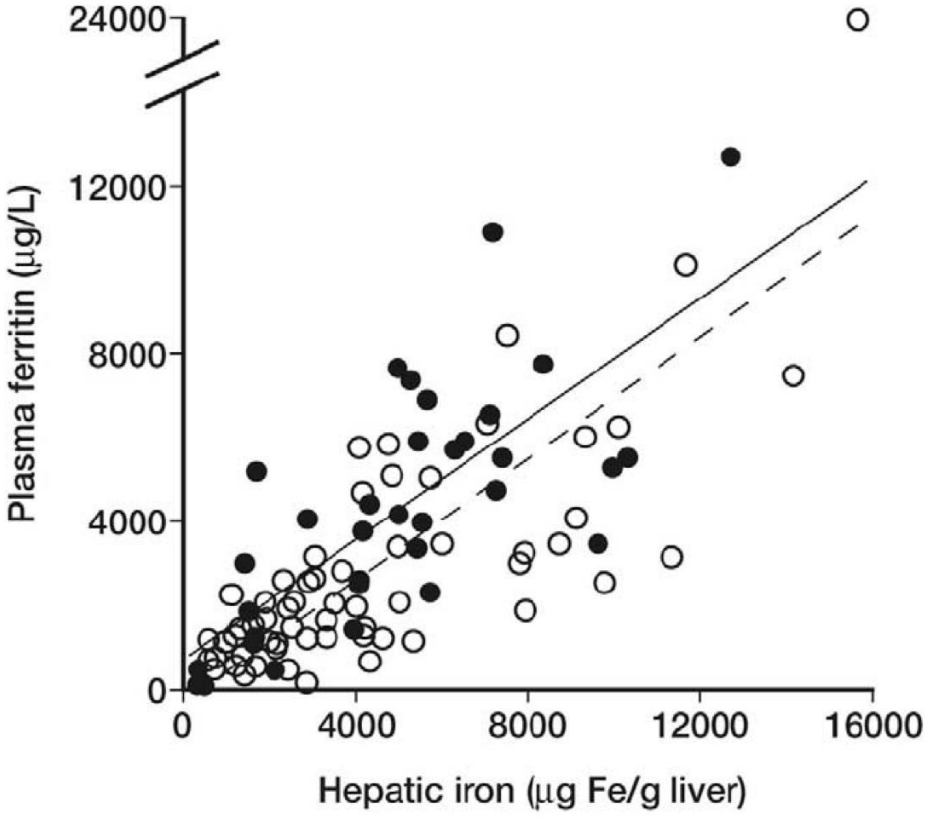
LIC thresholds and associated risks

FerriScan provides the accurate LIC information to ensure patient chelation therapy is optimised.

LIC threshold (mg Fe/g dry weight)	**Clinical relevance**
1.8	Upper 95% of normal
3.2	Suggested lower limit of optimal range for LICs for chelation therapy in transfusional iron overload[1]
7.0	Suggested upper limit of optimal range for LICs for transfusional iron overload and threshold for increased risk of iron-induced complications[1]
15.0	Threshold for greatly increased risk for cardiac disease and early death in patients with transfusional iron overload[1]

1. Olivieri and Brittenham, Blood. 1997;89:739-61.

Serum ferritin is only weakly correlated with LIC



There is a weak correlation between SF and LIC in the population of thalassaemia major (o) and sickle cell anaemia patients (•)

Brittenham et al, Am J Hematol 1993: 42, 81-85.

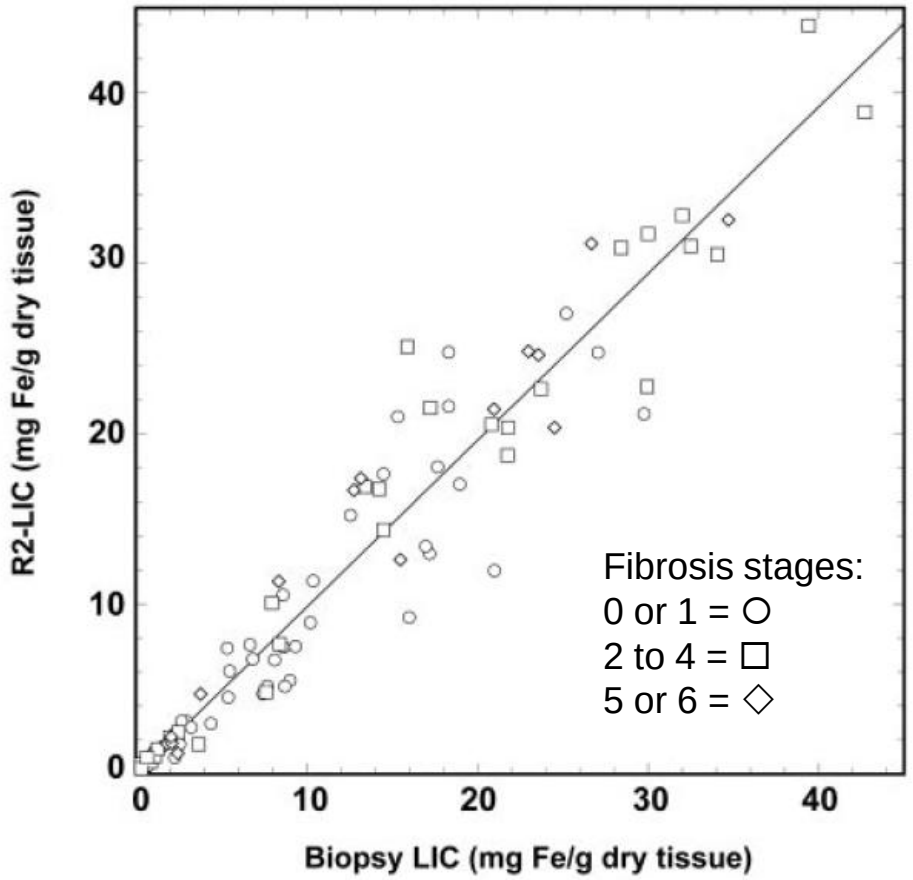
Serum ferritin

- Serum ferritin can be used for monitoring trends in patient iron loading
- Serum ferritin does not give reliable information on degree of patient iron loading
- Serum ferritin values do not provide the information required to optimise chelation therapy

FerriScan®

- non-invasive MRI measurement of LIC
- FerriScan is based on the R2-MRI imaging technique and unique patented software algorithms

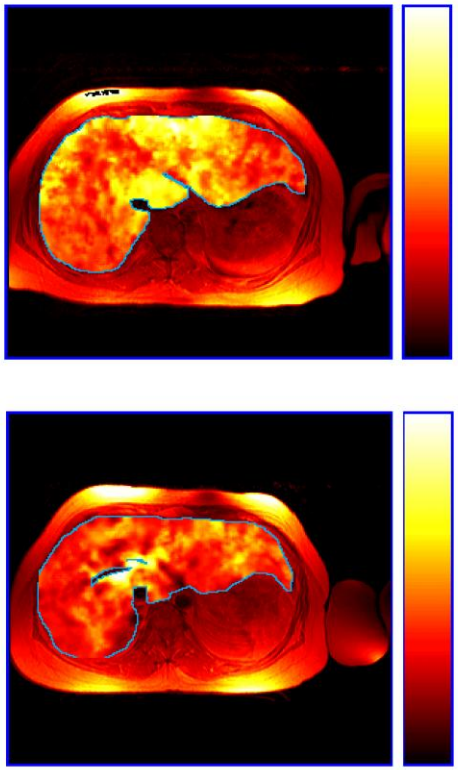
FerriScan® is a reliable accurate measure of LIC



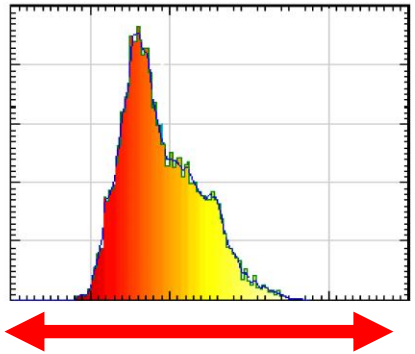
- High sensitivity and specificity over entire range of LIC encountered
- Unaffected by presence of fibrosis/cirrhosis
- More accurate than any other LIC test

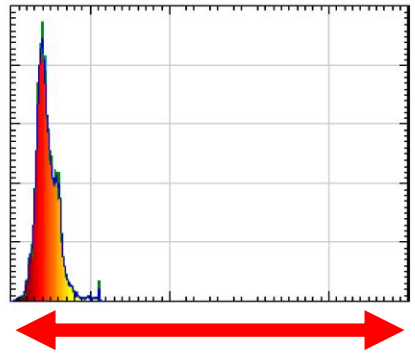
St Pierre et al, Blood. 2005; 105:855-861.

Example: FerriScan® measurements to monitor iron chelation therapy



LIC map





Low iron

High iron

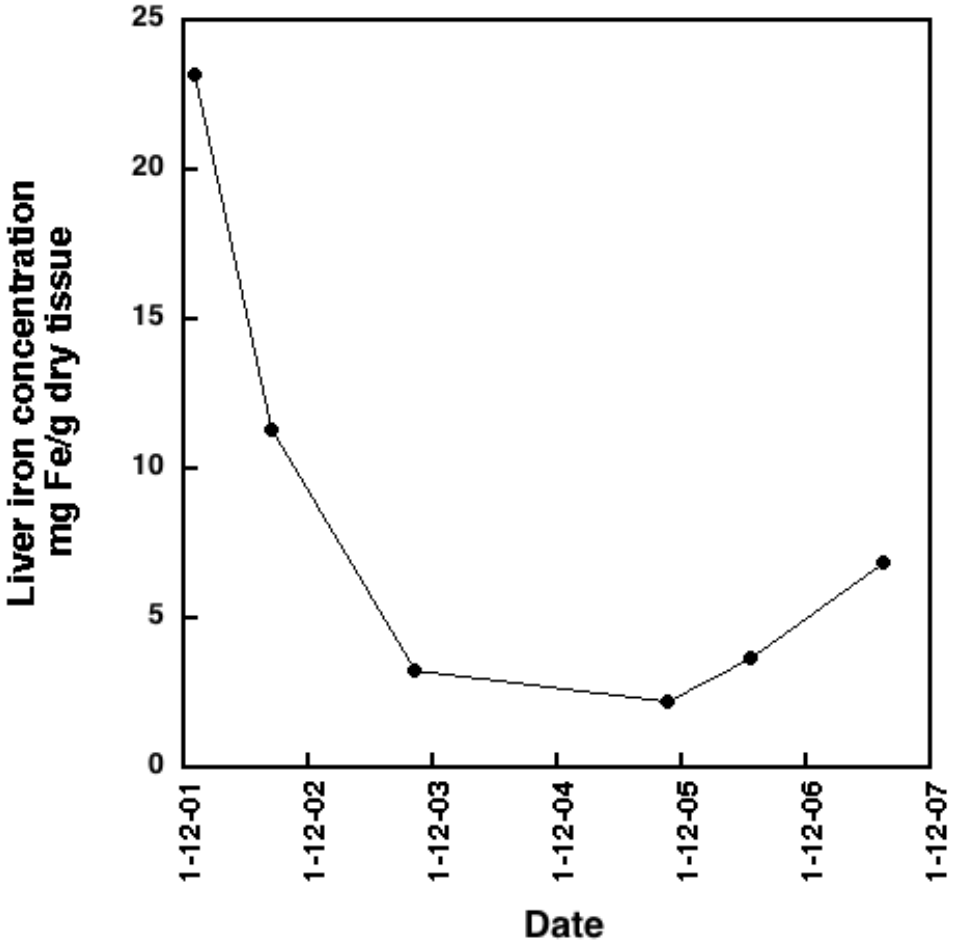
Before chelation therapy intervention

Mean LIC = 16.0

After 12 months of chelation therapy intervention

Mean LIC = 1.6

Example: Monitoring LIC with FerriScan®



Annual measurements of LIC can be used to monitor effectiveness of chelation therapy

Benefits of FerriScan®?

- FerriScan provide an accurate LIC measurement
- Annual measures can be used to optimise chelation therapy
- Avoid performing an invasive liver biopsy
  - FerriScan has replaced the need for liver biopsies at leading pediatric clinics.
- Minimise the risk of cardiac complications in transfused pateints

Why choose FerriScan®?

- FerriScan is regulatory approval
  - FDA, Health Canada, TGA, MedSafe and CE Mark
- FerriScan is the most accurate LIC test available
- FerriScan can be easily established on almost any MRI scanner
- No additional hardware or software is required
- FerriScan has a proven dynamic range of LIC measurement greater than any other MRI technique
- Centralised data analysis service ensures results can be compared between clinics and procedures are ISO 9001 certified

FerriScan® is not difficult to implement and is readily available

- FerriScan works on most MRI scanners available today
- The FerriScan team provides clear instructions and on-line support to help radiologists implement the technique
- FerriScan has been successfully implemented in over 22 countries at more than 100 MRI centers

FerriScan®

be better informed about your patient's Liver Iron Concentration

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