

Welcome to our June 2018 newsletter, bringing you an update on our most recent and upcoming activities.

Spotlight on Teaching Hospital Kandy



Lanka Thalassaemia Circle Council

How the First Sri Lankan Government-funded Bone Marrow Transplant Unit will be Changing Lives

In Sri Lanka in 2012 a group of individuals including Dr Kalinga Nanayakkara, a Consultant Obstetrician and Gynecologist from Teaching Hospital Kandy, joined together to form an organization called the 'Lanka Thalassaemia Circle'. The organisation comprises thalassaemia patients, parents of thalassaemics, and well-wishers who together fight for both the neglected rights of families affected by thalassaemia and to pursue a definitive treatment to help thalassaemic children. The 'Lanka Thalassaemia Circle' is affiliated with Thalassaemia International Federation (TIF) in Cyprus, and has membership numbers totaling at around 1500 thalassaemia-affected families.

Today in Sri Lanka there are over 3500 children with thalassaemia major, and 500,000 with thalassaemia carrier traits, most of whom are not aware of their thalassaemia carrier status. This was underlined by the team at Teaching Hospital Kandy who undertook testing of close to 500 antenatal mothers with haemoglobin levels unexpectedly below 10g % with HPLC. Dr Kalinga recalls being shocked at the results, which showed that 47% of subjects from Kurunegala, and 31% from Kandy, were unknowingly carriers of the thalassaemia gene.

Presently, every child with thalassaemia major will need

regular blood transfusions (monthly), the first starting when they are six months old, and then continuing for life, combined with consistent iron chelation therapy (every day or two) to reduce their iron overload. From the second year of their lives each child will need 10 – 15 vials of medication each month, provided by the State. Each vial costs about Rs. 780, with an annual cost of approximately Rs. 86, 400. At 20 years of age a patient will need 100 – 110 vials per month, resulting in an expenditure around Rs. 72,000 per month (Rs. 864,000 annually). This equates to approximately USD 5434 annually. The average annual income in Sri Lanka is approximately USD 750 per year.

The overall cost for medication for a thalassaemic child by 25 years of age, borne by the State, will total approximately:

- Rs. 17,094,000 if on Desferrioxamine injections (approx. USD 107,516)
- Rs. 6,421,800 if on oral medication (approx. USD 40, 390)

These figures result in Rs 1.7 billion being spent by the Sri Lankan government on thalassaemia medication alone. Total spend translates into approximately 7% of the national drug budget.

Up until now, there has been no potential cure for thalassaemia, with most thalassaemics dying at a young age due to the severe complications of iron overload affecting vital organs. **The oldest patients have been recorded as only 25 years old in Ampara, and 20 years of age in Batticaloa.**

The main cure available to treat thalassaemia is to undergo Bone Marrow Transplantation (BMT) from a compatible donor (a matching sibling), pioneered in the 1980s by Professor Guido Lucarelli, Director of the Mediterranean Institute of Hematology, in Rome Italy. He and his team have done more than 1,500 BMTs for thalassaemia (this figure translates to about 50% of all BMTs performed in the entire continent of Europe) in the past 30 years.

The improving success rate of bone marrow transplants around the world is now offering patients the real potential for a permanent cure for thalassaemia, hitherto an incurable genetic disease.

It was during Dr Kalinga's visit to Rome in October 2012 that Professor Lucarelli and Dr Kalinga discussed the possibility of setting up a bone marrow stem cell treatment centre in Sri Lanka. Professor Lucarelli had previously instituted similar centers in five African countries.



Dr Deepthi and Dr Kalinga with Professor Guido Lucarelli, the world's pioneer BMT physician. Rome 2012.

Successful BMT for thalassaemia requires a highly compatible donor including a 10/10 match of human leukocyte antigen (HLA) between the patient and the donor. Prior to HLA molecular typing being available in Sri Lanka, Teaching Hospital Kandy sent the first 100 'cheek swabs' to a genetic laboratory in New York, USA (September 2013) at the request of the President of the Bone Marrow Donor Programme (BMDP) in Singapore. Sets of 100 cheek swabs have been sent to New York from Teaching Hospital Kandy regularly since then, including samples collected from locations in Colombo, Batticaloa, and Kurunegala. Second samples, for re-confirmation and validation, are sent to a genetic laboratory in Germany.

After testing over 1000 families, Teaching Hospital Kandy's BMT unit now has over 100 thalassaemic children completely HLA matched with their siblings, ready for bone marrow transplantation.

Teaching Hospital Kandy is also performing pre-natal diagnosis by amniocentesis (to diagnose thalassaemia early in the first trimester of a pregnancy) for mothers who have previously had thalassaemic children. Samples are sent directly to the Genetech Laboratory in Colombo, with over 80 amniocentesis procedures performed to date.

Currently in Sri Lanka, BMT units have been established in two large private hospitals in Colombo. Over 40 of the matched children have been cured by BMT to date in these two private units, unfortunately however the cost of a BMT in the private sector exceeds Rs. 4.2 million (approx. USD 26,000), which is way beyond the means of most parents in Sri Lanka. Dr Lawrence Faulkner (below) worked in conjunction with a team of Sri Lankan consultants to conduct these more than 40 successful transplants.

Dr. Faulkner, who works as the medical director of the Cure2Children Foundation, visited the Lanka Thalassaemia Circle in 2013. He has established Bone Marrow Transplantation centres in Jaipur, India, and Islamabad, Pakistan, where successful therapy clinics have been instituted in these countries at one tenth the cost of setting up a BMT centre in a western country.

The two Sri Lankan private hospitals have signed a Memorandum-of-Understanding with the Cure2Children Foundation. Cure2Children is considered to be one of the largest international non-profit organization's (NGO) dealing with thalassaemia in the world today.

As a result of the unrelenting work and tireless resolve of the 'Lanka Thalassaemia Circle' and Dr Kalinga Nanayakkara, the Sri Lankan government has now sanctioned Rs. 856 million for a non-fee-leveling BMT Centre at the Teaching Hospital Kandy. To date, the 'Foundation Stone' has been laid by the Hon. Minister of Health, Dr. Rajitha Senarathne, on the 8th of May 2017, with **the BMT centre expected to be functional by late 2018.**

Following the visit of His Holiness Pope Francis to Sri Lanka in 2015, the Apostolic Nuncio to Sri Lanka His Eminence Archbishop Pierre Nguyen Van Tot arranged for the possibility of obtaining the services of clinicians from Bambino Gesù hospital in the Vatican to help with BMT in Sri Lanka.

At their request, in April 2018 the Director and haematologist of Teaching Hospital Kandy, four members of the Lanka Thalassaemia Circle, and eight engineers & architects from the construction company building the BMT unit in Kandy visited the large BMT Centre at Bambino Gesù to familiarize the team with the building construction & BMT procedure.



Study Tour – Bone Marrow Transplant Centre ‘Bambino Gesù’ Hospital. Rome, Italy - April 2018.

Resonance Health has been working directly with Dr Kalinga by trying to help find and set up an MRI scanner that is both suitable for FerriScan and in a convenient location for his patients. This work has included significant (and challenging) research attempts to try to identify the location, number, makes and models of MRI scanners in Sri Lanka, as well as introductions from the CEO of Resonance Health to the CEO and Head of Radiology of the only private FerriScan hospital in Sri Lanka.

Despite heartfelt offers of assistance from the private hospital team, the travel distances and costs would have still been prohibitive for the government patients so this was discounted as a potential solution. Through the great persistence of Dr Kalinga, a compatible scanner very nearby to Kandy Teaching Hospital has now been identified.

We look forward to providing Dr Kalinga and the team with excellence in iron quantification so that they can work with the highest quality data in their efforts to manage and cure children of thalassaemia.

The Resonance Health team highly admires Dr Kalinga and his team for their work in setting up the first public BMT unit in Sri Lanka. CEO, Alison Laws, says “Dr Kalinga has always sent our team his many blessings, and from the bottom of our hearts we return those blessings and wish for every success for he and his team in Kandy.”

If you would like to contact Dr Kalinga, please contact Resonance Health at info@resonancehealth.com to get in touch.

Clinical Trial Work Underway

Work on all three pharmaceutical company work orders announced earlier this year is now underway.

The clinical trials are concentrating on evaluating the efficacy and safety of potential new therapies to address patients with transfusion-dependent beta-thalassemia, and investigation of the efficacy and safety of a new treatment for patients requiring regular blood transfusions.

Some of these trials are utilising Resonance Health’s recently expanded Contract Research Organisation (CRO) capabilities, with ongoing project management of in-house and outsourced specialist reading services.

The Company is in ongoing confidential discussions with various pharmaceutical companies to fulfil their clinical study requirements, and we look forward to announcing further collaboration opportunities when appropriate.

Dragon 2 Study – Update



MRI Measurement of Liver Iron Concentration

Earlier this year the company announced the commencement of the Dragon 2 Study, a trial looking at several parameters including protocols to attempt to significantly decrease the acquisition time for the FerriScan® protocol.

A shorter acquisition time for the FerriScan® and FerriSmart® services would considerably reduce the time spent by a patient inside an MRI machine whilst also lowering the total costs to the hospital and patient.

In preliminary work, Resonance Health has obtained data sets from over 30 trial patients, with each data set containing multiple acquisition protocol profiles of varying scan times. The trial is expected to collect FerriScan® data sets from up to 100 patients, mapping a wide range of liver iron concentration (LIC) values. Work has now been escalated on the shorter acquisition due to very promising results to date.

The Dragon 2 Study is expected to finish recruiting patients for the other components of the study in the calendar year. We will update as work progresses.

FAST Portal – A new look with better performance

Resonance Health’s FAST portal has undergone a visual and architectural overhaul.

The user interface has been redesigned for consistency with the corporate brand, the FerriSmart web portal, and updated marketing materials.

Under the hood, the FAST portal has had its infrastructure converted to a more modern architecture that provides better stability, reduced potential downtime, streamlining troubleshooting and future upgrades, and improved page load speed optimisation for customers. Efficiency for radiology is of the highest priority for Resonance, so regular deployment of improvements is anticipated.



NEW LOOK - FAST portal logo and landing page.



NEW LOOK - Job processing screen as viewed by a regular user.

Please contact Resonance Health Support directly at support@resonancehealth.com if you require assistance.

Diabetic Retinopathy (DR) Grading Tool for use in Pakistan, Lebanon, and Bangladesh

Resonance Health has recently licensed an artificial intelligence software tool named DR Grader. The grading tool is a fully automated DR software system that uses images of the eyes and clinical risk factors to provide a reading accuracy of over 92%.

Resonance is currently conducting detailed market research and is in ongoing discussions with key opinion leaders to accelerate initial uptake.

Conference Recap - EHA

Resonance Health ended the quarter with a trip to the 23rd European Hematology Association (EHA) Congress in Stockholm, Sweden last week.

In attendance was Chief Scientific Officer, Professor Tim St Pierre, and Research Consultant, Susanna Katay-Davies who took the opportunity to meet with several pharmaceutical companies and key opinion leaders in the haemoglobinopathies and iron related disorders fields to discuss further collaboration opportunities.

The EHA congress also provided a strategic meeting place to connect with several influential attendees and discuss future FerriSmart® opportunities.

If you would like to use FerriScan® in your future clinical trial studies, please contact Resonance Health at info@resonancehealth.com to discuss your requirements.

A Sneak Peek at the New FerriScan Phantom Box design

Hopefully my new design will make me easy for radiology to find when a scanner verification is needed!

