



MUSICA makes the difference

At busy Logan Hospital, MUSICA and the DR 600 are keeping the imaging workflow smooth and efficient, while meeting the quality and dose reduction needs for patients and staff

Case study Logan Hospital
Meadowbrook, Queensland, Australia

AGFA 

Case Study

INTERVIEWEE:

MICHAEL NEEP, TEAM LEADER RADIOGRAPHER

A large catchment – nearly 1 million people – with a broad socio-economic range means the 2000 staff members at Logan Hospital, in Meadowbrook, Queensland, Australia, deal with a very busy service and some challenging patient cases. The emergency department of this public, non-tertiary hospital is one of the largest and busiest in the state of Queensland, with over 80,000 patients admitted each year.

In this demanding environment, time is of the essence when caring for patients – but quality, as always, comes first. For radiology, digital imaging plays a major role in achieving both. Throughout its digital imaging journey, Agfa has been a solution provider for Logan Hospital. And at the heart of Agfa's imaging solutions, explains Michael Neep, Team Leader Radiographer at Logan Hospital, is the MUSICA image processing software.

IMAGE PROCESSING SOFTWARE MATTERS: "WHAT AGFA IS OFFERING WITH MUSICA IS UNIQUE"

"I think that other vendors and even many healthcare professionals don't understand just how important image processing software is," Michael starts.

"What Agfa is offering with MUSICA is unique. Agfa produces exceptional image quality, and much of that is due to the MUSICA image processing. But the approach Agfa has taken does more: it speeds up pre- and post-processing, which is very important in a busy imaging environment. And it supports consistency of images, which is key for referrers and other doctors. Plus, it enables us to work on optimizing dose, so that we can really determine the lowest dose possible for our patients."

A NOTICEABLE DIFFERENCE: "I FIND THE AGFA IMAGE QUALITY IS EXCEPTIONAL"

Logan Hospital has two complete imaging environments: in the radiology department itself, and in the emergency department. 32 imaging staff members, out of the 43 FTE departmental staff, work across the two imaging environments as a single team. Generally, 10 staff members are working each day between the general radiography and emergency X-ray departments.

The hospital began its digital journey before Michael arrived in 2014. Both the emergency department and the radiology department had installed Computed Radiography (CR) systems – one of which was from Agfa. "This made it possible to compare performance in a real, clinical environment," Michael comments. "It was immediately noticeable, to begin with, that the images made with the Agfa CR didn't require any post-processing – all due to MUSICA. With the other vendor, the images often had to be manipulated post-processing. It was quite a stark contrast."



“The fact that we don’t need to adjust the images has a lot of advantages: image quality, workflow, efficiency... we save a lot of time. And we are also getting a consistent appearance to our images, which is important for referrers and clinicians.”

Michael Neep, Team Leader Radiographer

Based on this experience and comparison, when Logan Hospital expanded its emergency department, it again chose Agfa to implement Direct Radiography (DR). “Both of our DR rooms in the radiology department are Agfa, and two of our three DR rooms in the emergency department are Agfa. Both departments also have Agfa mobile DR units,” explains Michael. “I’m using systems from some of the largest vendors in Australia, and when I compare them, I find the Agfa image quality is exceptional.”

KEEPING A BUSY ENVIRONMENT RUNNING SMOOTHLY: “WITH MUSICA, WE SAVE A LOT OF TIME”

In both busy departments, MUSICA’s workflow advantages help radiographers and radiologists keep patient throughput smooth and fast. “The fact that we don’t need to adjust the images has a lot of advantages: not just for image quality, but also in workflow and efficiency. If we don’t have to fiddle with the image quality, we save a lot of time. And we are also getting a consistent appearance to our images, which is important for referrers and clinicians. When different people have to adjust each image to their own taste, you don’t have that consistency.”

And the efficiency advantages start from Day 1. “When the equipment is set up, all the thumbnails and body parts are linked with the correct algorithm, whether chest, pediatric, etc. With most vendors, you’ll need to tweak it from time to time, adjusting

algorithms to try to improve the image quality. We’ve never had to do that with MUSICA, because the image is optimal once the algorithms have been initially set.”

“WE WERE ABLE TO REDUCE DOSE IN THE KNEE PHANTOM BY 37%”

Patient radiation dose is important for everyone involved in a patient’s care, and for Michael, especially with his interest in pediatric imaging, it’s never far from his mind. While Logan Hospital doesn’t have specific, quantitative dose goals, it does follow the ALARA principle – As Low As Reasonably Achievable. By automatically optimizing images, MUSICA, specially adapted for DR imaging, helps the radiologists see greater detail, even using a lower dose.

But Michael wanted to take this further. “Agfa says their DR should enable a 30% dose decrease, which is already a lot. But I was not satisfied that we couldn’t go even lower,” says Michael. “Hospitals rarely carry out dose optimization studies when they get new technology; they ‘tweak’ exposure to a point where they are happy with the image quality and lower dose. Instead, I wanted to go back to the beginning. So my colleagues and I are carrying out an evaluation to see how we can optimize dose with our current MUSICA third generation software. Our goal is to find a standard methodology that we can use going forward – body part by body part. It is a long process, using phantoms, but so far for one, rather randomly selected body part (the knee), we were able to reduce dose by 37%.”

DOSE REDUCTION POTENTIAL REPORTED BY LOGAN HOSPITAL:

37%
dose reduction

in the knee
phantom



67%
dose reduction

for chest
images, without
using a grid





Third generation MUSICA, for better viewing of difficult areas

- Balanced presentation of both soft tissue and overlapping bone structures
- Visualization of subtle details in the abdomen
- True representation of orthopedic implants with clear bone interfaces
- High level of detail in the mediastinum
- Sharp trabecular patterns and excellent detail in the bony cortex

“MUSICA enables us to work on optimizing dose, so that we can really determine the lowest dose possible for our patients.”

Michael Neep

“UP TO 67% DOSE REDUCTION FOR CHEST IMAGES”

Michael Neep and his colleagues carried out a trial on gridless chest imaging, using both second generation and third generation MUSICA. “We collected 50 cases and performed chest X-rays with grids and MUSICA second generation image processing. Then we removed the grid and reduced the exposures, using both third generation MUSICA Chest+ and second generation MUSICA. We were able to achieve up to 67% dose reduction with gridless chest imaging compared to the image with grid – and in a blind imaging test, radiologists actually preferred the image quality of the non-grid images made with MUSICA. The main differences between the MUSICA Chest+ and the second generation MUSICA images are the contrast and brightness, so the quality of both was excellent: it is really a question of preference. Some other vendors charge for gridless chest dose reduction software, but it is already included in second generation and third generation MUSICA.”



AGFA'S CONTRIBUTION

Agfa has been with Logan Hospital throughout its digital journey, offering a full range of fixed and mobile solutions that support the busy hospital's challenging patient healthcare and workflow needs. The company has worked directly with Logan Hospital to adapt its solutions for its different imaging needs. Using the DR solutions with MUSICA image processing, the hospital can provide high-quality medical images that support confident diagnosis. At the same time, the solutions help the hospital to achieve its ALARA patient radiation dose goals.

AGFA'S SOLUTION

DR 600:

- The fully automated, ceiling-suspended DR 600 with ZeroForce technology offers precision and comfort for patient and staff.
- This complete and integrated solution provides high-quality images while maximizing versatility, making it ideal for a very busy environment like the emergency department of Logan Hospital.
- The solution can be switched between automated and manual mode, for flexibility that helps support patient safety.

MUSICA image processing:

All Agfa DR and CR solutions come with the 'gold-standard' MUSICA image processing.

- MUSICA gets all of the parameters it needs directly from the input image itself, automatically analyzes the characteristics of each image, and then optimizes the processing parameters, reducing the need for manual adjustment both before and after the image is taken.
- It provides consistent, high image quality and greater detail, helping avoid retakes.
- MUSICA is very easy to use and gets maximum information from an image, independent of whether the patient is thick or thin, or of the exam type.
- The high image quality enables potential dose reduction.

GRIDLESS CHEST IMAGING: “IT’S PRACTICALLY MAGIC”

One MUSICA difference that particularly struck Michael was the ability to perform gridless chest imaging. Anti-scatter grids are normally recommended for use with chest radiography to improve image quality. Grids can provide improved contrast detail by reducing the amount of scatter radiation reaching the detector. But in an environment such as the Intensive Care Unit, where mobile radiography plays a key role, they can be too difficult and time-consuming to position.

“Radiology has been using grids for about 100 years, and now MUSICA has come along and suddenly we can remove the grid. With gridless chest X-rays, for example, we are getting comparable image quality to X-rays using grids. The physics is the same in terms of X-ray and scatter; it’s the MUSICA software that makes the difference. The technology is so advanced, I sometimes joke it is easier to explain as ‘magic’. We’ve tried it with other vendors and haven’t been able to get the same results.”[see box on page 5]

“Agfa produces exceptional image quality, and much of that is due to the MUSICA image processing.”

Michael Neep

DR 600: “AGFA GAVE US A FLEXIBILITY THAT MATCHES THE NEEDS OF OUR DIFFERENT IMAGING ENVIRONMENTS”

The relationship between Logan Hospital and Agfa continues to grow. In 2017, the hospital installed the first DR 600 in Australia. “There were a few teething problems. For example, the ZeroForce technology, which makes it possible to move the tube head without effort, works really well and reduces strain and resistance. But when trying to do precision work, the sensitive ZeroForce would kick in, making fine movements difficult. Agfa found us a solution that enables us to switch off the ZeroForce with a just a double-tap,” describes Michael.

The hospital wanted to repeat the advantages of the DR 600 in the emergency department, but there was one serious concern. “In a trauma environment, we don’t always want to use an automated system, because there is a safety risk, for example, a patient being wheeled in could be hit by the moving machinery. Again, Agfa took those concerns on board and implemented a manual functionality on the DR 600. As a result, we made the decision to order the second DR 600 room for the emergency department.

Now, the DR 600 in our radiology department is used about 80% of the time in fully automatic mode, and 20% in manual mode. In the emergency department, it’s the other way around: 80% manual and 20% automatic. Agfa and the DR 600 were able to offer us flexibility that matches the different imaging environments with the same very high image quality and smooth workflow.”

WHO IS MICHAEL NEEP?

In his 18 years in medical imaging, Michael has worked with plenty of imaging modalities from a range of vendors. Today, he is a Radiographer Team Leader for general and emergency X-ray at Logan hospital. He also teaches, carries out research studies and evaluations, has authored multiple papers and is currently undertaking his Ph.D.





For more information on Agfa, please visit our website on www.agfa.com ■

Agfa, the Agfa rhombus and MUSICA are trademarks of Agfa-Gevaert NV, Belgium or its affiliates. All rights reserved. All information contained herein is intended for guidance purposes only, and characteristics of the products and services described in this publication can be changed at any time without notice. Products and services may not be available for your local area. Please contact your local sales representative for availability information. Agfa-Gevaert NV diligently strives to provide as accurate information as possible, but shall not be responsible for any typographical error.

© 2018 Agfa NV
All rights reserved
Published by Agfa NV
Septestraat 27 - 2640 Mortsel
Belgium

201807

AGFA 