

MUSICA

## DIRECT RADIOGRAPHY

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Reach for the stars

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Versatile and reliable radiography solution takes  
center stage in brand-new radiology room

### INTERVIEW:

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more from each image



## Direct radiography: the clear advantages



In healthcare, confidence is critical. All along the patient's care continuum, every stakeholder must know they can rely on one another, on the technology, on the diagnosis and on the decisions.

Imaging is a key component of this process, and the diagnosis is in the details. Agfa HealthCare's direct radiography (DR) solutions provide those details. As the imaging expert, we are committed to ensuring that every hospital can experience the benefits of DR: faster speed, improved workflow, increased throughput, enhanced productivity,

greater patient satisfaction, shorter intervals between procedures, the potential for reduced patient radiation dose, and more.

While image quality can never be compromised, each healthcare facility has its own needs in terms of mobility, budget, versatility, space, collaboration and much more. Those diverse needs are met by our comprehensive portfolio of DR solutions that lets every hospital – whether large or small, city-center or rural, high imaging volume or low imaging volume – find the right fit.

Our MUSICA image processing is the standard in the market; along with our entire DR range, it continues to evolve to address the changing needs of today's imaging environment. And our experienced services teams all over the world can support and accompany the healthcare organization, no matter where it is in its digital transformation.

So physicians can make more confident diagnoses, improving clinical decision making and patient care. It's a clear advantage, for everyone.

*Caroline Burm*

*Marketing Communications Manager*

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Small footprint and threefold growth  
in throughput make DX-D 300 ideal  
for major Ukraine clinic

The Agfa HealthCare editorial team would like to thank all those who contributed to this publication.

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Starship Children's Health, New Zealand

# Reach for **the stars**

Agfa HealthCare's DR solutions deliver dose reduction potential to the children of New Zealand.

**INTERVIEW WITH** **DIANA BROWNE**, Team Leader MRT

As the only pediatric hospital in New Zealand, Starship Children's Health is responsible for taking in all tertiary referrals from around the country. Diana Browne, Team Leader MRT, Starship Radiology explains how their new Agfa HealthCare DR solutions, with their balance of dose reduction potential and sharp resolution, are helping address the challenges posed by their smallest and least mobile of patients.



“The DX-D 600 is very easy to use and although there were a few new features, people quickly learned the processes that they need to follow to deliver the workflow.”

**DIANA BROWNE**  
Team Leader MRT

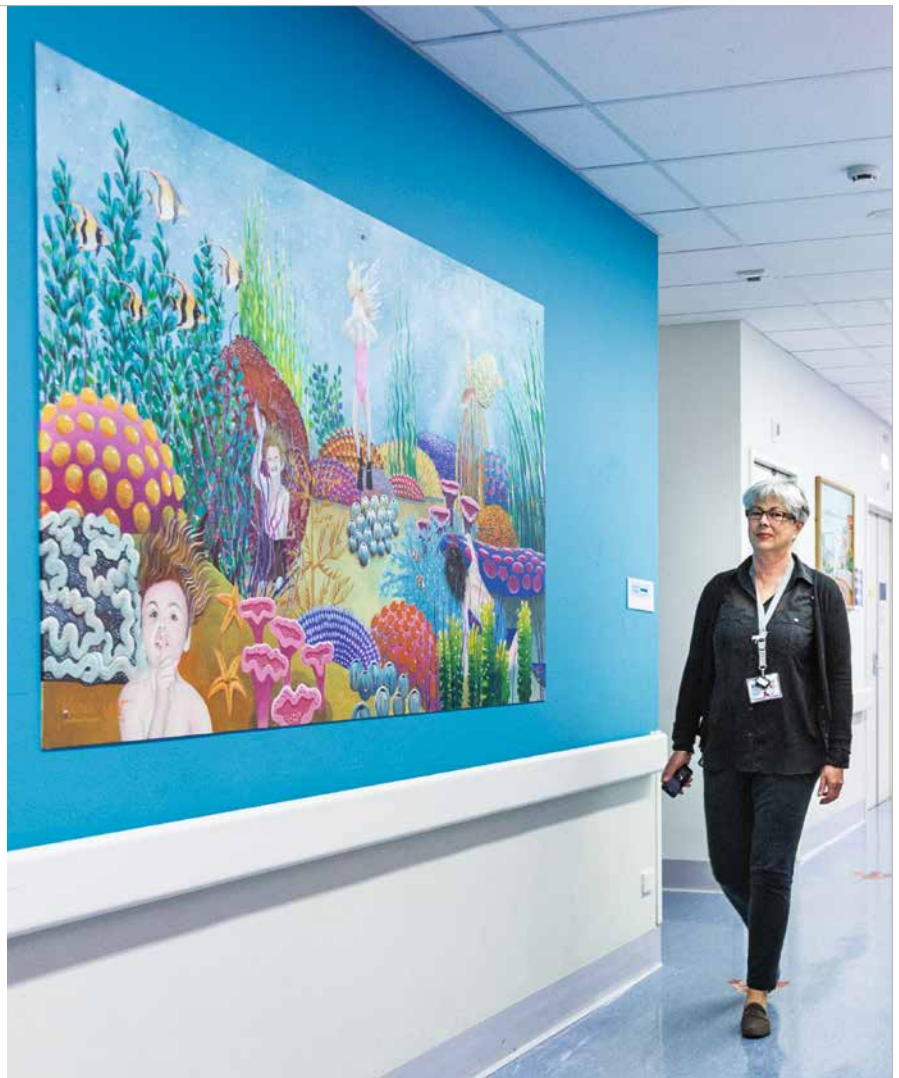


Starship Children's Health in Auckland is a dedicated pediatric healthcare service and major teaching center, providing family centered care to children and young people throughout New Zealand and the South Pacific. "We have a dedicated children's Emergency Department, a big orthopaedic service – we do a lot of spine surgery – and respiratory and oncology departments," explains Diana Browne. "In terms of capabilities, we have three general rooms; a fluoroscopy unit, MRI, CT, ultrasound, and we have nuclear medicine coming shortly."

Starship's first foray into direct digital radiography was its recently installed DX-D 600 room. "Having previously experienced the high quality imaging provided by Agfa HealthCare's DX-G CR solution in our Neonatal Intensive Care Unit (NICU), that, as well as the potential for dose reduction, made the DX-D 600 an obvious choice for our first DR solution.

### Agfa HealthCare is all about image quality

"When we were considering installing our DR room, we did our research," says Diana. "We looked at similar solutions at our district health board and some of the Australian pediatric hospitals with whom we work. However, their solutions from another vendor were posing image quality vs exposure issues that required a 'work-around'.



### DX-D 600

- Two-detector, high-productivity, high-throughput general radiography system
- Three configuration options: from manual, to semi-automatic, to fully-automatic
- Cesium Iodide DR detector technology, giving significant patient dose reduction potential
- Specially-tuned MUSICA, for gold standard image processing, and NX workstation, for smoother workflow
- Can be integrated with Agfa HealthCare's CR systems, bundling the high quality and flexibility strengths of each technology



With Agfa HealthCare's image processing software MUSICA, no such compromises were required. I believe it's because Agfa HealthCare's solutions are focused on the image processing. They are experienced at being at the imaging end rather than the hardware end and have a long history that they can draw on."

### The perfect balance of dose vs resolution

Before making their final purchasing decision, Diana ran trials using the DX-D 100, Agfa HealthCare's mobile unit with portable digital detector. "Initially we did a trial with the DX-D 100 – and the images were excellent, comparable to our needle phosphor CR.

We also found that we could drop the dose a little bit because the resolution is so good." An added benefit was its wireless stitching capabilities.



“It allowed us to have a wireless detector in the table that also allows for stitching in a supine position. With most other vendors, if you want to be able to do long leg stitching or spine stitching you have to have a fixed detector,” says Diana.

### Excellent installation and training support

As with any solutions, there has been a small learning curve and adjustments to working practices. “We have only had the DR room for a couple of months, so we still need to address some challenges – such as the best way to take images of babies while erect – but we will. It will definitely be worth it in the long run.”

And no challenge is too big when there is knowledgeable support at hand. “We have had excellent support from Agfa HealthCare throughout the installation and training,” says Diana.

“The DX-D 600 is very easy to use and although there were a few new features, people quickly learned the processes that they need to follow to deliver the workflow.”

### The change to workflow has been stand-out

As to the future, Starship is hoping to get another DR room before the end of the year to build on the already visible improvements in workflow that the DX-D 600 has delivered. “One area that workflow improvements have been particularly stand-out is during clinics,” says Diana. “When we have a busy fracture clinic we can have 70 to 80 patients and their families in the waiting room. Being able to X-ray them, see the image immediately and send them on their way, makes for a much better patient flow. It may seem a small thing but it makes a huge difference.

“Things are going a lot more smoothly with one digital room. Two digital rooms will be fabulous!” ■

### Did you know...

Opened in November 1991, Starship was New Zealand’s first hospital built exclusively for children and young people.

With a name chosen to appeal to its young visitors, and to reflect the main building’s design, the building’s central atrium has a rainforest theme with a playground.

Each of its five levels is painted a different color that has a symbolic meaning:

- Aqua for the Pacific Ocean;
- Orange for land;
- Blue for sky;
- Yellow for sunshine; and
- Pink for health.



St. Elisabeth's Hospital, Wittlich, Germany

# DX-D Retrofit delivers excellent imaging and an enhanced patient experience

Wireless detector seamlessly integrates in clinical processes and supports the radiology assistants in managing their time and tasks.

INTERVIEW WITH **DR. DIRK LOMMEL**, Radiologie Wittlich



“DX-D Retrofit opens up a whole new world in radiology. The image quality is more brilliant. This helps enormously and results in a confident diagnosis.”

**DR. DIRK LOMMEL**  
Radiologie Wittlich

“This lets us enhance the patient's experience, because when staff is more relaxed and has more time for the patient, it creates a better atmosphere.”

**CHRISTA MARTINI**

Chief Radiology Assistant, Radiologie Wittlich

More and more small and medium-sized hospitals are handing over the running of their radiology departments to independent radiology services. Radiologie Wittlich handles the radiology departments of the St. Elisabeth's Hospital in Wittlich, the Cusanus Hospital in Bernkastel-Kues, and the Maria Hilf Hospital in Daun. “We perform around 50,000 X-rays each year for inpatients and outpatients at St. Elisabeth's Hospital alone,” explains Dr. Dirk Lommel.

In 2006, when re-equipping the practice, Dr. Lommel and his three colleagues at Radiologie Wittlich first considered implementing DR technology. “But we needed a solution for both intensive care and pediatric intensive care. So at that point we opted for Agfa HealthCare's CR solutions. We knew, though, that in our next investment phase we would switch to DR.”

### Easy to install and get to grips with

The requirements for the DR system were clear: it had to be easy to integrate in the existing X-ray facility and offer very high image quality.

Satisfied with their experience with Agfa HealthCare's CR solutions, the practice selected the DX-D Retrofit with the wireless cesium iodide flat panel detector in cassette format, which offered impressive functionality and good value for money.

Implemented in September 2012, the DX-D Retrofit links to the IT network by WLAN and digitizes the existing Bucky table and wall stand with state-of-the-art DR technology. “The installation went very smoothly and we were able to integrate the system quickly and without problems,” says Practice Manager and Chief IT Administrator Michael Lüpke.

### Fast and flexible imaging, reliable diagnostics

The new solution has made a big impact for the radiology assistants, who find it straightforward to use, especially as it has the same user interface as the CR system.

They were also amazed by its speed, comments Chief Radiology Assistant Christa Martini. “Reading a CR imaging



### DX-D Retrofit

- Excellent image quality
- Improved patient experience
- Quick and easy to install
- Connection to RIS/PACS

plate takes around two minutes. The DR detector takes seconds. We also save the time spent going back and forth to the digitizer.”

The time savings make an especially noticeable impact during on-call hours, says Dr. Lommel. “Weekends, we handle as many as 150 examinations. The duty staff member has to take care of the RIS administration, job processing and activity input alone. With the DX-D Retrofit detector system, the radiology assistants can manage their time more effectively.”

“This also lets us enhance the patient's experience, because when staff is more relaxed and has more time for the patient, it creates a better atmosphere,” concludes Christa Martini. ■



### Did you know...

- The hospital in Wittlich offers a very wide range of services. All specialisms are covered, from gynecology, internal medicine, and gastroenterology to vascular, visceral, and thoracic surgery.
- Radiologie Wittlich operates three practices in different regions: St. Elisabeth's Hospital, the Cusanus Hospital in Bernkastel-Kues, and the Maria Hilf Hospital in Daun.

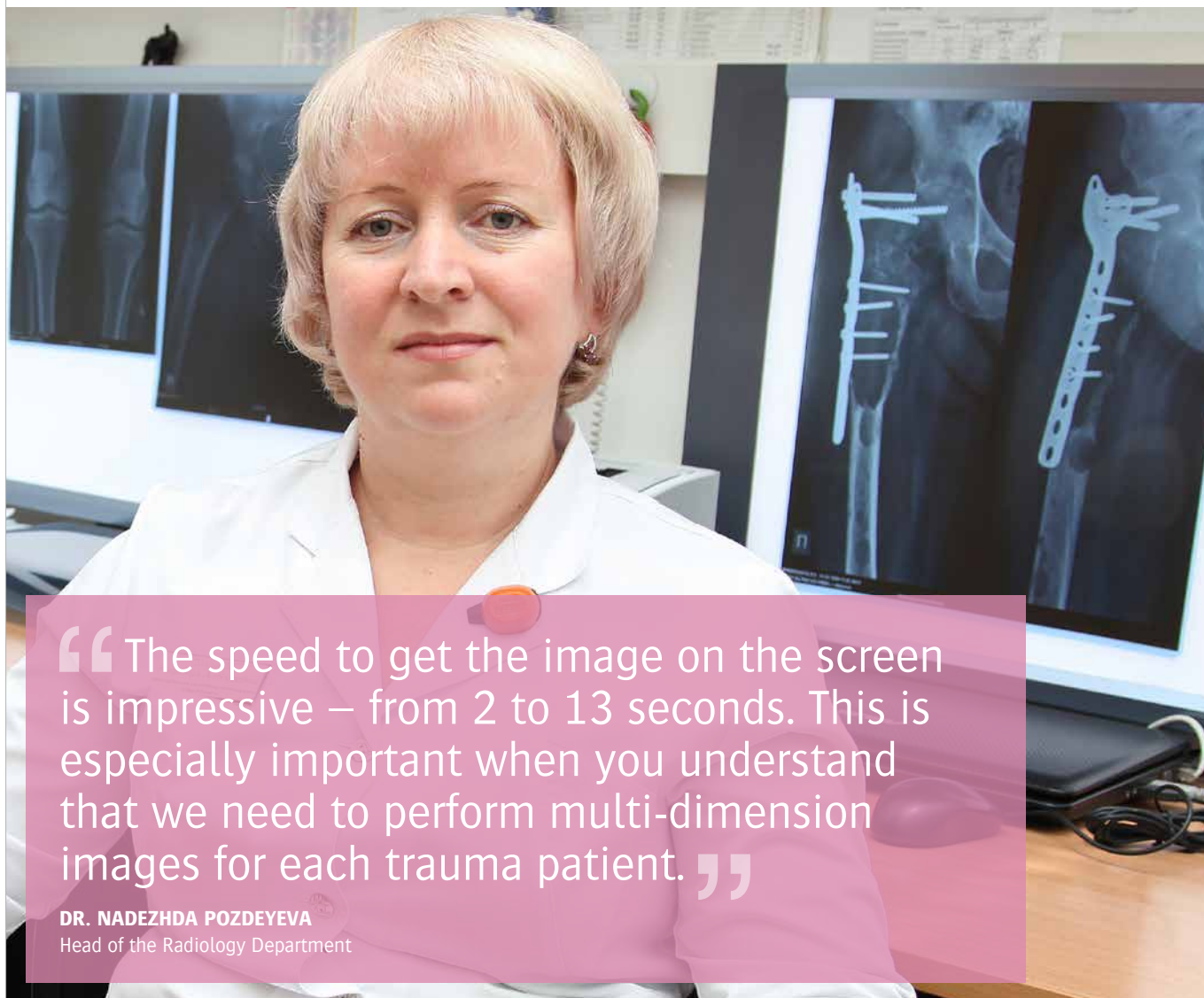
Institute of Traumatology and Orthopaedics, Irkutsk, Russia

# Digitally transforming a historic Siberian trauma hospital

Irkutsk Institute of Traumatology and Orthopaedics improves diagnosis, patient care and workflow with broad range of digital solutions.

**INTERVIEW WITH NADEZHDA POZDEYEVA**, Head of the Radiology Department

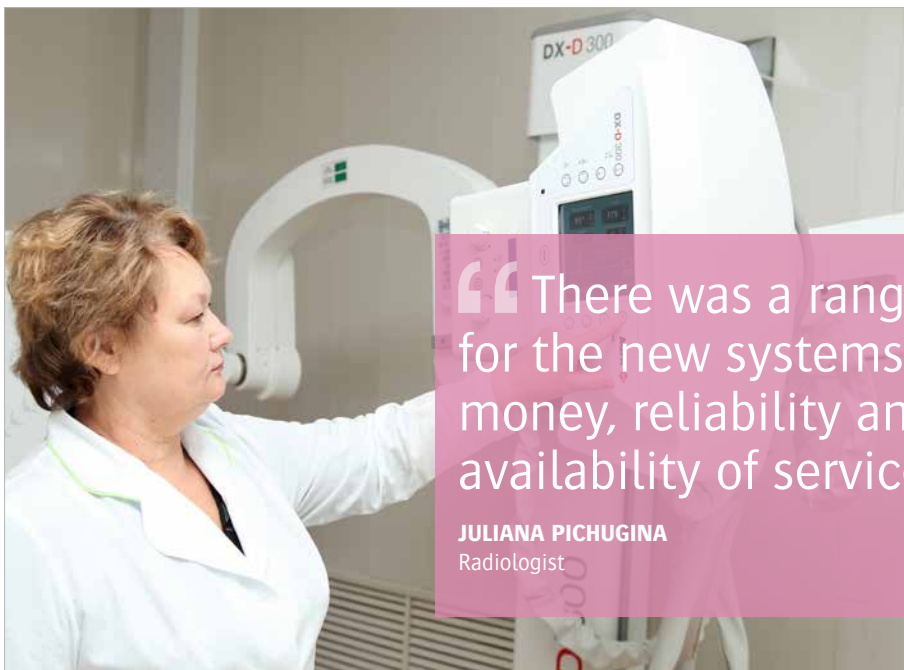
The cold and remote region of Siberia carries with it its own health challenges, many of which are addressed by the Irkutsk Institute of Traumatology and Orthopaedics. “The main challenges faced by our hospital are injuries and both congenital and acquired musculoskeletal abnormalities,” explains Nadezhda Pozdeyeva, Head of the Radiology Department. Over the past few years, the hospital has been transforming its radiology department by implementing a full series of Agfa HealthCare digital solutions. The goals of the project are to obtain more informative images, reduce radiation exposure to patients and staff, and improve the quality of diagnoses.



“The speed to get the image on the screen is impressive – from 2 to 13 seconds. This is especially important when you understand that we need to perform multi-dimension images for each trauma patient.”

**DR. NADEZHDA POZDEYEVA**  
Head of the Radiology Department





“There was a range of requirements for the new systems: the best value for money, reliability and functionality, and availability of service and support.”

**JULIANA PICHUGINA**  
Radiologist

“Our region is experiencing some pretty disheartening trends towards increases in injuries and musculoskeletal problems,” continues Dr. Pozdeyeva. “It’s directly related to the life here: car accidents, workplace injuries and illnesses, and even icy footpaths all play a role in increasing the number of injuries we see.” At the same time, fewer young people are being attracted to the medical profession, she says.

The Russian Ministry of Health has also published requirements regarding the implementation of digital technology. All these factors contributed to a growing

awareness within the Institute for the need to find solutions to improve the efficiency and effectiveness of the radiology department, by implementing advanced and modern digital imaging technologies.

#### **Value for money, reliability, functionality, service & support**

The Institute considered a number of manufacturers, attending various conferences on radiology and imaging. “We had no experience of working with digital systems, but we were very willing to learn,” explains radiologist Juliana Pichugina. “There was a range of requirements for the new systems:

the best value for money, reliability and functionality, and availability of service and support.”

The hospital chose to acquire several direct (DR) and computed (CR) radiography solutions: the DX-D 300, DX-D 100 and DX-D 400, which is combined with a DX-G CR digitizer, for greater versatility.

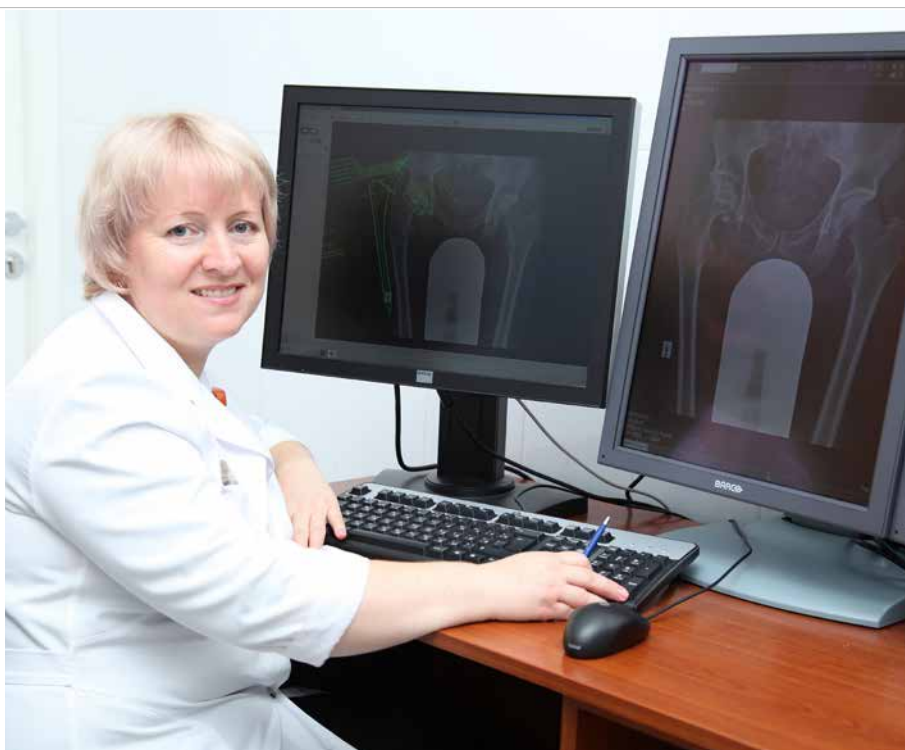
#### **A family of DR solutions to meet wide-ranging needs**

The DX-D 100 is a mobile DR system that can be operated with one finger, yet provides high-quality images.



“Our experience cooperating with Agfa HealthCare can be characterized by: information availability, reliability and responsibility.”

R. NADEZHDA POZDEYEVA



“We use it in the trauma operating room, in order to check during operations that bone fragments match and to precisely position fixing and holding mechanisms. It also transmits the images directly to the desktops of physicians for diagnosis and archiving, via the Wi-Fi router we installed in the operating room.”

The hospital uses the DX-D 300 multi-functional, fixed U-shaped DR system with the full leg full spine (FLFS) option to provide digital images of the lower limbs

and spine. “This is especially convenient for planning surgery procedures using the IMPAX Orthopaedic Tools,” explains Dr. Pozdeyeva. “The DX-D 300 offers us a rich functionality, and we can use it with a gurney, which allows us to examine bedridden patients.”

For heavier patients, the universal DX-D 400 system has an elevating table that can be lowered to 50 cm above the floor, reducing the strain on the medical staff. “The speed to get the image on

the screen is impressive – from 2 to 13 seconds. This is especially important when you understand that we need to perform multi-dimension images for each trauma patient,” Dr. Pozdeyeva highlights.

The exam-independent, gold-standard MUSICA image processing software provides very high quality images, automatically analyzing the characteristics of each image and optimizing processing. “And using needle detectors for certain examinations also provides significant radiation dose reduction for the patients,” Dr. Pozdeyeva adds.

### Image management suite and specialized tools for orthopaedics

The hospital also implemented the IMPAX SE suite with IMPAX Orthopaedic Tools, which is used to apply digital templates and to complete measurements in preparation for orthopaedic surgery. The SE suite is ideal for taking small enterprises from analog to digital. It offers a modular design that enables the manipulation, management and centralization of medical imaging data. A complete solution from the moment it is implemented, it requires no additional upgrades, making it a very cost-effective solution.

### A ‘historic’ installation

The implementation team faced a further unusual challenge:



## Agfa HealthCare's solutions

### DR and CR solutions

- DX-D 100: mobile direct digital X-ray unit
- DX-D 300: floor-mounted DR with fully motorized U-arm
- DX-D 400: scalable, floor-mounted DR solution with elevating table option
- DX-G: CR solution uniting superb image quality, potential dose reduction and a drop-and-go buffer-based workflow

### The SE Suite

- A portfolio of data management software, created specifically to address the needs of smaller imaging environments, such as private practices; small imaging centers; orthopaedic, chiropractic and veterinary centers; and imaging clinics

### IMPAX Orthopaedic Tools

- Digital pre-operative planning and templating tools for orthopaedic surgeons



“The hospital building is a historic monument of the city of Irkutsk,” explains Dr. Pozdeyeva. “On the one hand, this meant we needed to preserve the building’s appearance as much as possible. But on the other hand, the engineering was extremely outdated. So before the installation, we carried out a complete check of the sub-floors, electric networks heating and water supply systems. These were then aligned with the requirements for the equipment installation. In a new building, of course,

these modern requirements would be built in, so there would be no delay or additional costs.”

In addition, the implementation team had to ensure that the hospital and its patients were not impacted during the installations. By installing the DX-G digitizer for temporary use, the hospital could already carry out the necessary studies in digital format, using the wards’ X-ray machines. And despite these challenges,

the team implemented all of the solutions in accordance with the delivery schedule.

“Together, these solutions have significantly enhanced our ability to diagnose, to plan operations and to transmit and store data in the network,” concludes Dr. Pozdeyeva. “Furthermore, our experience cooperating with Agfa HealthCare can be characterized by: information availability, reliability and responsibility.” ■



## Agfa HealthCare's contribution

- Close cooperation with hospital administration, physicians and technical service, as well as city authorities, to ensure that the stringent preparations were properly carried out
- Delivery and installation of all equipment and solutions in accordance with the delivery schedule
- Creative solutions to challenges such as the use of the DX-G during implementation to allow the hospital’s regular work to go on
- An active role in the preparation of the rooms, acting in a coordinated way during equipment delivery and installation



Signature Healthcare Brockton, Massachusetts, USA

## From small acorns big trees grow

Susan Boulanger, Director of Imaging Services at Signature Healthcare Brockton, Massachusetts, explains how replacements to its 25+ year old technology have been heavily influenced by its trial of Agfa HealthCare's DX-D 100 mobile solution.

**INTERVIEW WITH SUSAN BOULANGER**, Director of Imaging Services

As the oldest and largest in-patient hospital within its area, Signature Healthcare Brockton Hospital serves a diverse community of needs. The hospital is home to a transitional residency program, and has a full imaging department. Twenty-one surrounding communities are also served by Signature Medical Group, the largest multi-specialty and multi-provider physician practise group in the area with 11 sites, including mirrored services in CT, MRI, ultrasound, radiology and mammography.



“Some of our existing equipment is more than 25 years old, and while it has been the workhorse of the department, we decided the equipment needed to be upgraded and replaced,” explains Susan Boulanger. “At the same time, we also wanted to be able to put some additional tools into the hands of the people making time-sensitive clinical decisions. I was eager to add digital mobile solutions so that if you were in the Emergency Room doing a trauma exam or in the operating room suites, the image could come up on the screen instantly to enable the team to work quickly on that patient without having to wait. They could get a general view of what was happening even prior to the radiologist doing a final interpretation.”

### The radiologists' choice

Boulanger decided the most effective way to source the right solution was to undertake a series of trials. “We looked at three different models and did demos over a three- to four-month period. I then pulled 10 images from each mobile demo machine and showed them to different radiologists, asking them to judge on image quality

“The bone work was just stunning and the DX-D 100 has made a significant impact on our ability to care for critically ill patients. It allows physicians to make minor or even major changes immediately because the images are available instantly.”

**SUSAN BOULANGER**

Director of Imaging Services at Signature Healthcare Brockton

alone.” The outcome was not what she had expected. “When we looked at image quality specifically, all of the radiologists picked the Agfa HealthCare images.”

### **MUSICA image quality was just stunning**

While Boulanger was surprised: “I thought there would be more similarities between vendors,” the real difference was made by Agfa HealthCare’s image processing MUSICA. “The bone work was just stunning,” says Boulanger, “and the DX-D 100 has made a significant impact on our ability to care for critically ill patients. It allows physicians to make minor or even major changes immediately because the images are available instantly.”

### **Trials highlighted the excellence in image quality**

The DX-D 100’s reputation was further enhanced when a power failure during a snow storm last winter resulted in it being used to support the rooms in the main radiology department for about 30 minutes. “For a brief period we were acquiring images only on the DX-D 30C, the DX-D 100’s portable detector, and the team thought these images were actually better than images taken on some of the other vendors’ permanently installed digital equipment. The images aren’t just superior for a mobile solution, but for a fixed room solution too, so when our most recent off-site location opened up we purchased a fixed Agfa HealthCare room – the DX-D 600, with Full Leg Full Spine capabilities.

### **Full Leg Full Spine an invaluable resource**

“Although we don’t have a high volume use for the FLFS – maybe a few times a week – when the need is there it is invaluable. The patient simply stands for a few seconds while you capture full, accurate images that don’t require multiple exposure stitching, so there is less room for error. It’s a really great piece of technology.”

### **DX-D 600 delivers better patient comfort**

Another major benefit of the DX-D 600 solution is the luxury of spending more time with the patient. “The technologist no longer has to step out. They can do all of their work in the vicinity of the patient; worklists, protocols, and so on, so it allows more interaction and increases the speed of performing the exam because of the immediacy of the images.”

“Before we had the DX-D 600, typically, by the time the radiologist was reading



the image, the physicians would be waiting to decide how to care for the patient. Now they are able to see that image within 20 seconds. Having the DX-D 600, with its two detectors, also decreases the amount we have to move patients around as we are able to image from the same equipment.”

### **Flexibility helps even out workflow**

The flexibility the DX-D 600 offers also pays dividends. “Our radiologists are often shared between several different locations and the need to maximize workflow effectiveness, share information and read images from any location is critical to our success. With excellent quality images available to any radiologist at any location, we can manage workload more effectively and even out any peaks and troughs.”

### **Proactive and timely service support**

Boulanger admits the initial decision to go with a new vendor for such essential solutions posed important questions. “One area of consideration was no existing install base here for Agfa HealthCare. I was concerned about how much service support there would be and how that would work but they have been fabulous. They respond, they are timely; they stop in just to do routine checks. The service support and the working relationship with the service team are wonderful.”

### **Installing Agfa HealthCare solutions for image quality alone makes sense**

As a result, the relationship looks set to be a long and fruitful one. “We did the mobile units, then we did a fully

automatic room, then we did a semi-automatic room. We have a five-year plan – and as we open off-sites and move things around, there is definitely a plan to continue to upgrade and replace equipment. Agfa HealthCare has become a vendor of choice for us; they have worked well with us, the installation process has been easy to manage and, just based on the image quality alone, installing more Agfa HealthCare solutions makes sense.” ■



### **DX-D 100**

- Efficient mobile bedside imaging for improved patient comfort
- DX-D 30C wireless detector for enhanced flexibility and improved infection control
- Instant high-quality image capture
- Immediate image validation, transfer and access (HIS/RIS/PACS integration)
- Specially-tuned MUSICA, for gold-standard image processing, and NX workstation, for smoother workflow
- Dose reduction potential
- Indicated for pediatric and neonatal
- Easy handling of a broad range of general X-ray exams

Poviat District Hospital, Ilawa, Poland

# Versatile and reliable radiography solution takes center stage in brand-new radiology room

DX-D 400 supports National Health Fund requirements and aligns with Public Procurement Law.

**INTERVIEW WITH DR. ROBERT ZBYSŁAW**, Head of Radiology Department

The 500-bed Poviat District Hospital is located in the town of Ilawa, in the northeastern part of Poland. Like other countries with government-funded healthcare systems, Poland's hospitals are challenged with tight budgets and a need to streamline management processes. For the Poviat District Hospital, the DX-D 400 scalable radiography solution addresses these varied needs, and it's also the keystone in its brand-new radiology room.



“ We know, from our experience, that Agfa HealthCare is a stable and experienced partner. ”

**DR. ROBERT ZBYSŁAW**  
Head of Radiology Department



“Other solutions might cost less, but they don’t offer this level of seamless integration.”

DR. ROBERT ZBYSŁAW



### DX-D 400

- Flexible and affordable solution
- Floor-mounted, easy to install, takes up little space
- Adaptable configurations, available in two versions, so it can be tailored to users’ specific needs
- Provides growth path to DR



### Agfa HealthCare’s contribution

- Supports all phases of implementation projects, from initial consultation to long-term service contracts
- In-depth knowledge of hospital imaging and information management needs
- Local support backed by global organization

The new radiology room is part of a hospital-wide renovation, which includes new rooms for developing departments, like radiology. For Dr. Robert Zbysław, Head of the Radiology Department, the versatility of the DX-D 400 in this new setting is very important. “The setup in the new exam room allows us to perform all kinds of X-ray exams. Because the DX-D 400 is mounted on the floor, we did not need to incur the construction costs required with a ceiling-suspension system,”

he says. “And we can perform as many kinds of exams with the floor-mounted DX-D 400 as we could with a ceiling suspension-type system.”

### DX-D 400 enables highest levels of integration

The ability to integrate different solutions, seamlessly, is essential as the hospital also uses a CR solution from Agfa HealthCare. “Now we have a single vendor partner for our CR





and DR solutions. This makes our job easier because we don't have to talk to multiple partners, or organize different service visits," explains Dr. Zbysław. "Other solutions might cost less, but they don't offer this level of seamless integration."

The Polish healthcare system is managed through the National Health Fund (NFZ). A focus for the NFZ is to make healthcare delivery more efficient throughout the country. The implementation of the DX-D 400 provides the Poviát District Hospital with a gradual growth path to DR, while at the same time safeguarding previous investments in analog systems.

The hospital looked for a flexible, user-friendly solution with a sound price-to-functionality ratio. The NX workstation of the DX-D 400 also contributed to the decision, as the hospital had used Agfa HealthCare's CR for the past two years, so staff are familiar with the NX interface. "The DX-D 400 and the shift to digitalization are in line with the requirements of the NFZ, and also the Public Procurement Law, which governs all hospital purchases," says Dr. Zbysław.



The hospital's long-term relationship with Agfa HealthCare adds value too. The Poviát District Hospital has used Agfa HealthCare's analog solutions for 10 years, and CR solutions for two years. "We know, from our experience, that Agfa HealthCare is a stable and experienced partner," concludes Dr. Zbysław. ■

“ We know, from our experience, that Agfa HealthCare is a stable and experienced partner. ”

DR. ROBERT ZBYSŁAW





# Technology Corner

PIET VUYLSTEKE, PhD, Senior Researcher

JAN LEEUWS, Business Unit Manager Digital Radiography

## Next generation MUSICA: more from each image

The introduction of MUSICA image processing software was a true technological breakthrough, offering automated, exam-independent digital image processing using contrast enhancement founded on multiscale mathematics. Now our next generation MUSICA\*, with its own technology advances including Fractional Multiscale Processing, takes us and our customers another big step forward.



High level of detail in spine, mediastinum & below diaphragm

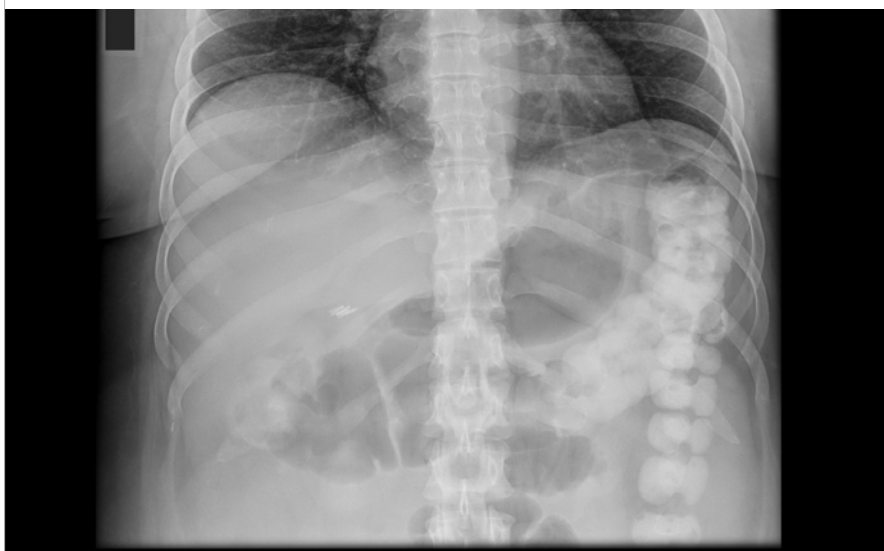
Next generation MUSICA will soon be available for all of our CR and DR systems. Jan Leeuws and Piet Vuylsteke from Agfa HealthCare sat down to explain the technology behind it, and what it means for radiologists and other clinicians.

### Consistently high image quality across all exams

“We developed the new version of MUSICA based on our commitment to enhancing imaging quality and in close collaboration with our customers. This launch keeps us in the forefront of technology, and allows us to continue meeting the evolving imaging needs of the healthcare sector, resulting from factors such as the ever-increasing success of our digital imaging systems,” explains Piet Vuylsteke, PhD, Senior Researcher. It’s important to understand that the next generation MUSICA still offers all the benefits of previous generations, say the interviewees. “MUSICA is fully automatic, very easy to use and install, and gets maximum information from a clinical image, independent of the patient’s body size (adult, child or infant; slim up to obese) or of the exam type,” comments Jan Leeuws, Business Unit Manager Digital Radiography. “There is no need to configure the image processing parameters for each exam, and the technologist doesn’t need to apply specific settings for each exam type and exposure technique. That hasn’t changed.”

Neither has our MULTIscale Image Contrast Amplification (MUSICA) mathematical principle. Developed in the 1990s, it has proven since then to be the most successful image processing technology for digital X-rays.

“Our challenge is to take the best and make it even better! One of our key design goals was to let the users obtain consistently high image quality across all exams and all patients at all hospitals, while applying a minimal radiation dose.”



Better visualization of subtle details in the abdomen

“ Subtle bone details often tend to fade in the vicinity of implant edges, but with the next generation MUSICA, these details are well preserved and easily visible. I compare it to being able to hear a pianissimo passage after an explosion. ”

**PIET VUYLSTEKE**

Business Unit Manager Digital Radiography

### In the forefront of technology

To address this challenge, we have made some fundamental changes to the system's substructure. "In order to nicely render the most difficult zones of an image, such as the abrupt transitions from low to high density areas, we have applied a new mathematical algorithm, called Fractional Multiscale Processing (FMP). With this algorithm, the image processing filters are further decomposed to elementary fractions, which are processed separately. As a result, we can represent the grayscale differences in a more natural way, without artifacts," explains Piet Vuylsteke. FMP also eliminates the need for window level adjustment to enhance visibility of details.

Several additional improvements have been made in the mechanisms that adapt the contrast, noise and grayscale of the images. In general, the images are more homogeneous and pleasant to look at for the radiologist, as well as being enhanced and represented in a very consistent way. Another advantage of the next generation MUSICA is that it is even easier to install.

### The diagnosis is in the details

With its larger dynamic range, the new version of MUSICA offers enhanced detail of images and consistency of visualization, especially for images with large differences in signal strength. Image processing is robust and the image is always optimal, independent of the exposure technique. "Subtle bone details often tend to fade in the vicinity of implant edges, but with the next generation MUSICA, these details are well preserved and easily visible. I compare it to being able to hear a pianissimo passage after an explosion," says Piet Vuylsteke.

For example, in skeletal imaging, no artificial shadows show up next to long bones or metal implants, making subtle details of the interfaces more visible. Trabecular structure is presented with improved sharpness, and there is appropriate transparency in overlapping structures such as the carpal bones. In chest X-rays, details from the bones, the mediastinum and the lower part of the lung behind the diaphragm are revealed with better clarity, without impairing the lung visualization.

Jan Leeuws comments: "With MUSICA, we get more details out of an image, and in a more comfortable way. This supports the radiologist to make a confident diagnosis in a shorter time frame, improving the overall workflow of the department."

### Adapted to users' real needs

To make sure that the image processing was optimally adapted to the needs of the users, the development team collaborated with regional and leading university hospitals worldwide, including different specialties such as pediatrics, chest, etc.

When developing the new software version, it was critical to be 100% sure that the intelligence built into the system renders images with optimal diagnostic information. "When we showed the radiologists the new version of MUSICA, they often got used to the new image presentation very quickly!" says Piet Vuylsteke. "Once you appreciate that level of detail, they said, 'there's no going back'." ■

\*Works in progress



Sharper trabecular, carpal and cortical bone  
Balanced presentation of soft tissue and all bone structures

### Better viewing of difficult areas

- High level of detail in the mediastinum
- Sharp trabecular, carpal and cortical bone
- Balanced presentation of both soft tissue and overlapping bone structures
- Clear visualization of subtle details in the abdomen
- True representation of implants with clear bone interfaces
- No need for window level adjustment, resulting in very comfortable & fast reading

Emergency Center, Belgrade, Serbia

# “Innovation and education” the way forward for hospitals in Serbia

Busy emergency center in Belgrade implements direct digital technology for improved delivery of patient care.

INTERVIEW WITH DR. ZLATIBOR LONČAR, Surgeon and Director of the Emergency Center



“The DX-D 100 is easy to use, provides the images quickly, has a much higher image quality than our previous system, offers a more efficient workflow and is independent from the electricity network.”

**DR. ZLATIBOR LONČAR**

Surgeon and Director of the Emergency Center



“An important goal for us is to upgrade our technology. Other goals are to incorporate new methods and processes.”

DR. ZLATIBOR LONČAR



The Clinical Center of Serbia is the largest hospital in the country, with 33 different clinics. Its emergency center has two clinics of its own and 300 beds, including 170 for intensive care, making it the busiest emergency center in all of Serbia. Image quality, ease of use, and the ability to perform mobile imaging at patients' bedsides were the key considerations in choosing the DX-D 100 DR solution to address the many imaging challenges in this demanding environment.

Before implementing the DX-D 100, emergency patients had to be taken to another floor of the center for imaging. The center opted for a new DR imaging

solution to support the emergency center in providing the best care to its patients, including those restricted to hospital beds. “We use the DX-D 100 for our most challenging patients,” says Dr. Zlatibor Lončar, Surgeon and Director of the Emergency Center. “With it, we can perform examinations without having to move patients around.”

For Dr. Lončar, implementing new technologies and improving education are key points in taking Serbia's hospitals into the future. “We need to implement a new generation of equipment for all of our hospitals, and to further educate staff,” he says.

## Did you know...

Belgrade, the capital of Serbia, has a population of about 1.6 million residents. It's the country's center of education, culture, science and economy, and is one of the largest cities in Southeastern Europe. Belgrade is also the center for Serbia's film industry, and hosts the annual FEST film festival, launched in 1971.

## New focus points for healthcare in Serbia

The Serbian Government is exploring ways to bring the country's healthcare infrastructure more in line with other European countries. Focus points in this initiative include strengthening the healthcare system, ensuring equal access for all citizens, and streamlining the delivery of healthcare with improved processes and technologies.

"An important goal for us is to upgrade our technology. Other goals are to incorporate new methods and processes," says Dr. Lončar. "In surgery, for example, we want to introduce more sophisticated ways to perform surgery for oncology patients."

On the education side, Serbia has two radiology societies, and both offer programs for continuing education. For Dr. Lončar and his colleagues,

international radiology congresses and the internet are also important sources of information on new developments in healthcare and image and information management.

## Meeting complex patient needs with easy-to-use mobile solution

When it comes to new technology, these sources, in addition to a comprehensive tender process, inform purchase decisions. "We chose the DX-D 100 through a tender process, and made our decision on quality and price," says Dr. Lončar. "As we saw from the tender, mobility and workflow with the DX-D 100 are excellent. This solution addresses our needs in our central intensive care where we have the most complicated patients."

Thanks to its ergonomic design, the DX-D 100 is easily moved and operated by a single person, for improved quality and efficiency of bedside imaging. It can be used with several DR detectors, delivering instant previews and leading-edge resolution for a broad range of general radiography X-ray studies.

## DX-D 100 delivers speed, image quality and more efficient workflow

The DX-D 100 comes with Agfa HealthCare's gold standard MUSICA image processing software, which

has been specially adapted and tuned to further enhance the excellent DR image quality.

"The DX-D 100 is easy to use, provides the images quickly, has a much higher image quality than our previous system, offers a more efficient workflow and is independent from the electricity network," says Dr. Lončar. For the emergency center, the implementation of the DX-D 100 marks another step forward in improving patient care. Continuing to build out with digital technologies will remain a focus, concludes Dr. Lončar. "We are currently looking at new modalities and a radiology network, as well as a new digital mobile X-ray solution for our operating rooms, where we currently have analog X-ray equipment." ■

## Agfa HealthCare's contribution

- Develops robust products that can handle customers' demands
- Offers solutions that support the transition to digital at every step of the way
- Local expertise and support backed by the assurance of a large global organization





“We chose the DX-D 100 through a tender process, and we made our decision on quality and price.”

DR. ZLATIBOR LONČAR



### Solution: DX-D 100

- Mobile DR solution offering instant imaging excellence for immediate validation wherever needed, from the ICU to the wards
- Handles a broad range of general radiography X-ray studies
- Short exposure time means images are available immediately, and can be validated straight away after exposure
- Higher productivity and image quality translates into lower cost per exam





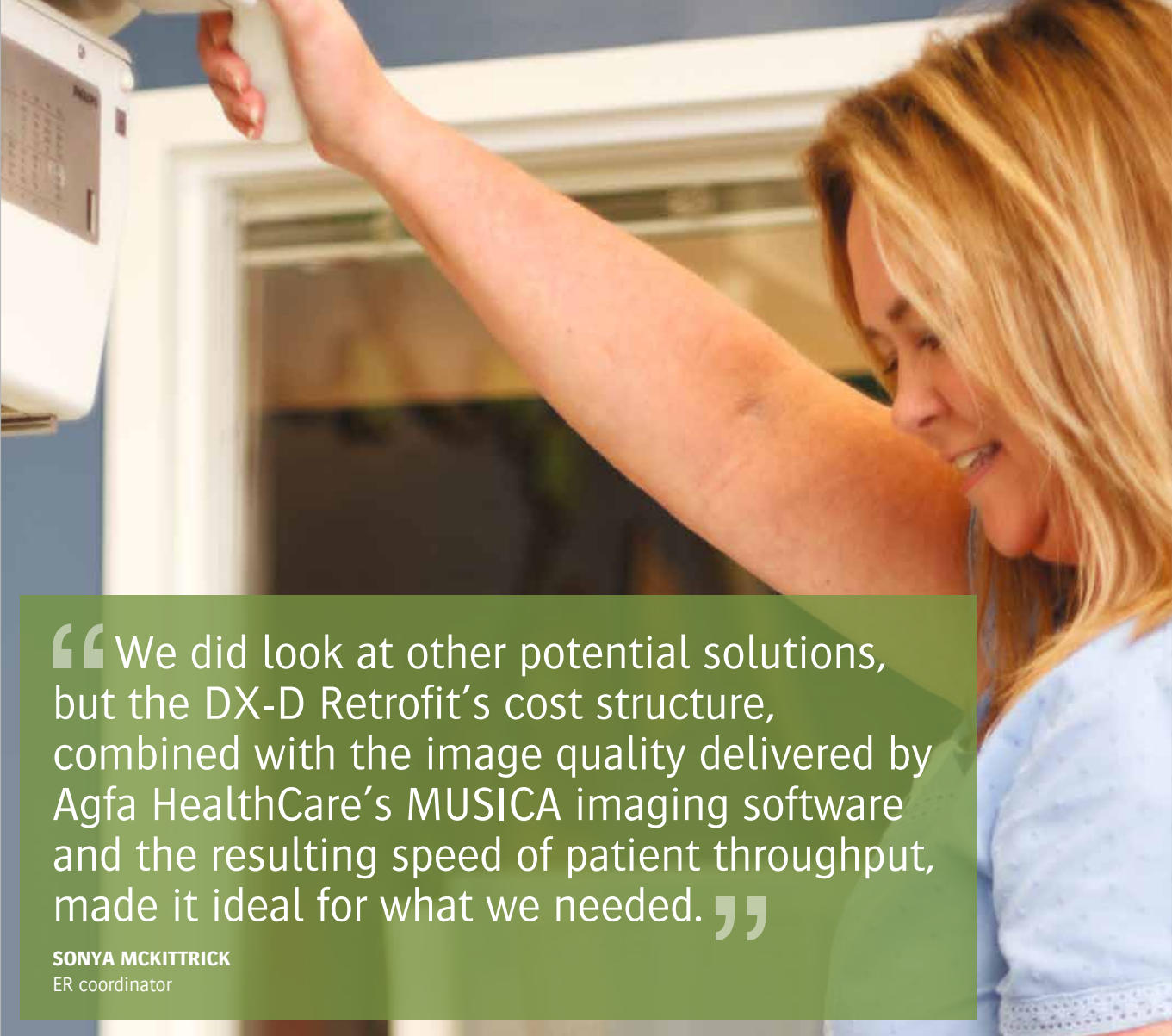
Greenville Health System, Greenville, South Carolina

## Focused on a digital future

Sonya McKittrick, Greenville Health System's ER coordinator, explains how DX-D Retrofit is helping deliver time savings and a high level of image quality and speed that makes it popular with users.

**INTERVIEW WITH SONYA MCKITTRICK,** ER coordinator

As Greenville's only 24-hour Level 1 Trauma Center, Greenville Health System, based in Greenville, South Carolina, has recently upgraded its offering into "a highly integrated delivery system committed to transforming the delivery of health care and improving the health of its community". A key part of that commitment is, wherever possible, to harness the power of new technologies and solutions that will help deliver on that promise. The DX-D Retrofit's non-invasive, connection-only solution is part of that drive; delivering time savings and a high level of image quality and speed that makes it popular with users.



“ We did look at other potential solutions, but the DX-D Retrofit's cost structure, combined with the image quality delivered by Agfa HealthCare's MUSICA imaging software and the resulting speed of patient throughput, made it ideal for what we needed. ”

**SONYA MCKITTRICK**  
ER coordinator



“Thanks to the medical school’s innovative approach, and the support of Agfa HealthCare in providing its IMPAX solution to the school, all students will be proficient in their use of PACS by the time they reach their third year of study.”

**DR. WILLIAM HINES**

Clinical Assistant Professor of Radiology

### Cost-effective, fast, high quality images

For smaller organizations, particularly, the desire to go digital is one that has to be carefully balanced against clear and quantifiable cost benefits. As Sonya McKittrick, the ER coordinator explains, “One of the biggest issues for us when considering a new DR solution for one of our emergency rooms was that it needed to be demonstrably cost-effective. We did look at other potential solutions, but the DX-D Retrofit’s cost structure, combined with the image quality delivered by Agfa HealthCare’s MUSICA imaging software and the resulting speed of patient throughput, made it ideal for what we needed.”

### Fast installation and easy to use

Ease of use was another key factor: “We have had a long relationship with Agfa HealthCare, so we were already familiar with using Agfa HealthCare’s IMPAX and CR systems. With the DX-D Retrofit, we required hardly any training at all. The solution was installed in less than a day and we were up and running virtually immediately.”

### Delivers detail missing from other solutions

Greenville HealthCare System’s pediatric radiologist was a particular champion of the image quality provided by the DX-D Retrofit, as Sonya explains. “We do a good many skeletal surveys on children, particularly when there is a suspicion of abuse. With the DX-D Retrofit you can see small details and minute fractures that you might be unable to see on our other CR and DR solutions,” says Sonya. And, having had a taste of an

effective DR solution, Sonya’s aim for the future is clear: “I hope by the time that I retire – in about three years’ time – that we will be fully DR! It really is a huge improvement.”

### Agfa HealthCare supports medical school launch

And improvement is something that has become a watchword at Greenville, with the launch three years ago of its own independently accredited medical school – the University of South Carolina School of Medicine Greenville; an initiative supported by Agfa HealthCare. As Dr. William Hines, Clinical Assistant Professor of Radiology and a retired interventional radiologist with over 40 years’ experience explains, “We recognized that in traditional medical schools, even after four years of study, many students lack the skills necessary to quickly adapt to post-graduate residency programs. We wanted to create a learning

environment where there would be early clinical exposure coupled with training in the use of the electronic medical record, and with PACS.

“South Carolina ranks 43rd out of 50 states in the number of primary care physicians per capita; a key reason for that has been the state’s lack of capacity to educate students. Thanks to the medical school’s innovative approach, and the support of Agfa HealthCare in providing its IMPAX solution to the school, all students will be proficient in their use of PACS by the time they reach their third year of study.

“With this improvement in education, we hope to make a fundamental change to both the provision of care and our graduates’ understanding of the social and environmental issues that impact health and health care; after all, disease doesn’t begin in the emergency room.” ■

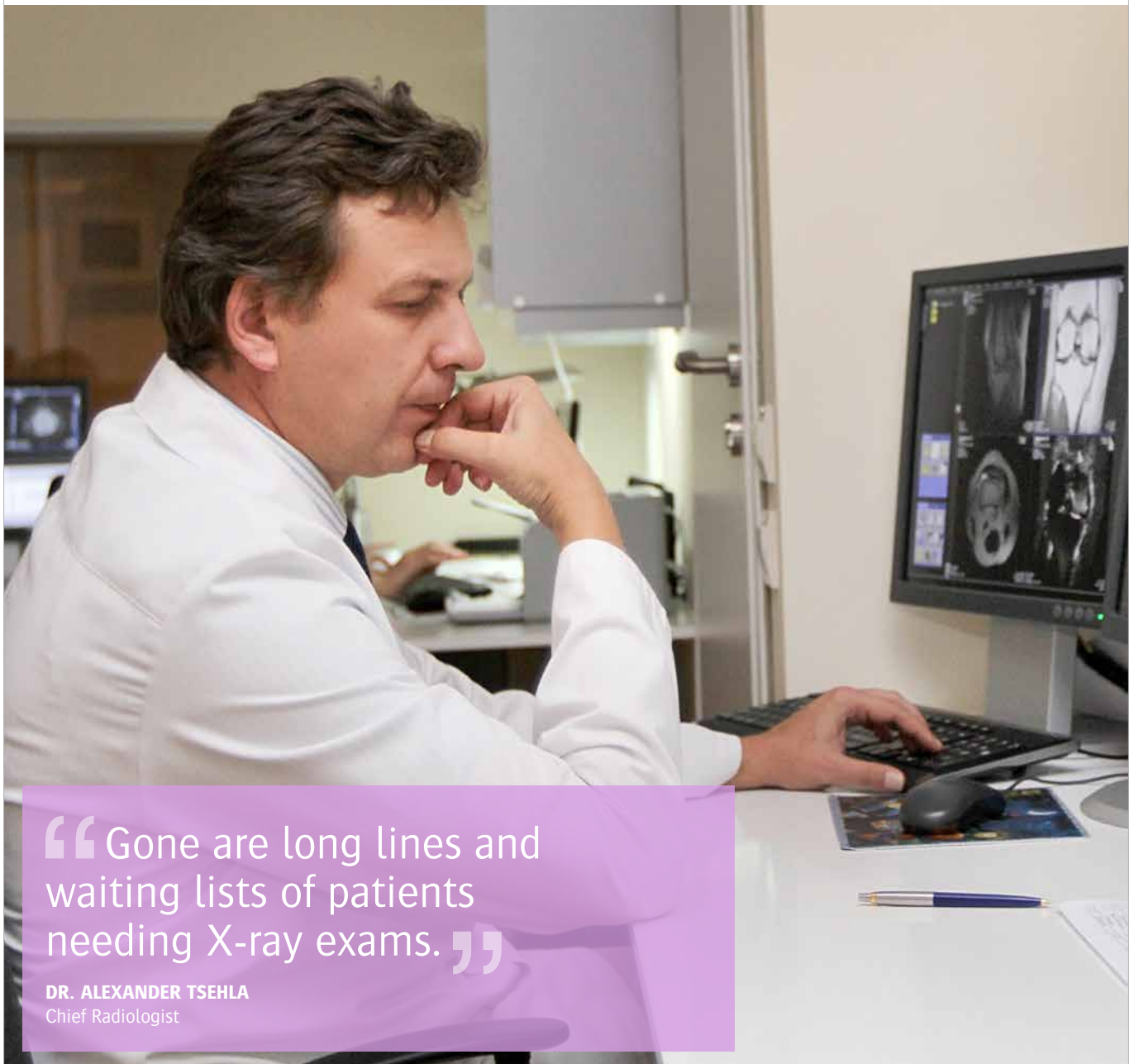


Genesis Clinic, Simferopol, Crimea Ukraine

# Small footprint and threefold growth in throughput make DX-D 300 ideal for major Ukraine clinic

Excellent diagnostic quality and improved delivery of care promote radiology department's image among referring physicians throughout Crimea region.

INTERVIEW WITH **DR. ALEXANDER TSEHLA**, Chief Radiologist



“Gone are long lines and waiting lists of patients needing X-ray exams.”

**DR. ALEXANDER TSEHLA**  
Chief Radiologist



## DX-D 300 floor-mounted DR solution:

- Handles a broad range of general and specialty X-ray studies
- Flexible and affordable, combining a single detector with fully motorized positioning
- U-arm allows lateral cross-table exams on rolling tables and wheelchairs
- Cesium Iodide DR detector technology offers potential for dose reduction
- MUSICA image processing offers outstanding contrast detail and consistently excellent image quality



**Established in 1995, Genesis Clinic is today among the region's leading multi-profile healthcare facilities. The facility itself is compact with limited space resulting in X-ray rooms too small for conventional imaging units. A key requirement in selecting a new DR solution was a small footprint with state-of-the-art features.**

The clinic is located in Simferopol, a popular beachfront resort in the autonomous Crimea Republic on the Black Sea's northern coast. The challenge for the clinic – to keep its medical services rates modest so the majority of people can afford them, while pursuing its philosophy of providing medical treatments of supreme quality – is huge. Genesis Clinic has been very successful in balancing these challenges.

### Correct diagnosis upfront fosters efficient service and improved healing

All procedures are performed from two X-ray exam rooms. In order to improve patient throughput and image quality characteristics of the radiology exam room, the Genesis Clinic's owners purchased Agfa HealthCare's DX-D 300 direct radiography solution in September 2012. Dr. Tsehla explains that he personally chose the solution and persuaded the clinic's management to purchase it. He thoroughly considered a variety of applications, and opted for the DX-D 300 for several reasons.

"In addition to compact size and high-quality results, we needed a system with the potential to lower X-ray dose, and I believe only manufacturers like Agfa HealthCare with a long history in the market offer such solutions," says Dr. Tsehla. "According to my evaluation, the radiation dose for a chest exam performed on the DX-D 300 is much lower compared to the previous X-ray system we had."

"DX-D 300 matches image quality with sophisticated automation in many stages of the diagnostic process, which significantly simplifies the technologists' work," underlines Dr. Tsehla. He says it takes no longer than three to five days for a new technologist to master the DX-D 300.

### Motorized U-arm and fast image display contributes to threefold exam increase

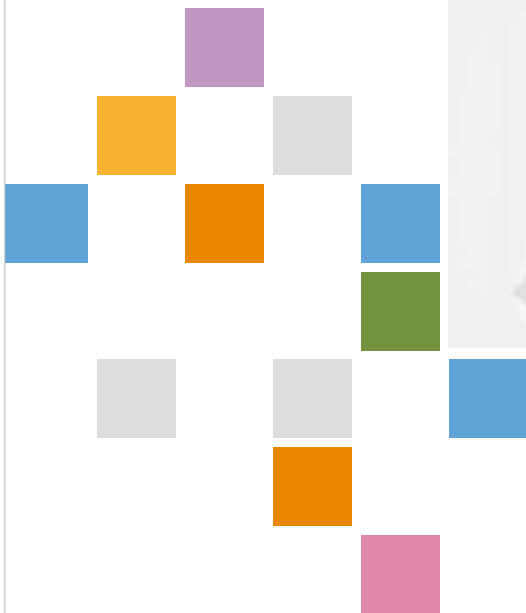
The DX-D 300's speed in capturing and displaying X-ray images has allowed the

radiology department to increase the number of exams threefold compared to a year ago, adds Dr. Tsehla. Gone are long lines and waiting lists of patients needing X-ray exams, he says. Also, the NX workstation, equipped with MUSICA image processing software, easily creates DICOM images, which allow doctors to store a specific patient's images on an individual database and refer to this resource later if required. Another advantage of Agfa HealthCare's DX-D 300 is its highly flexible U-arm that greatly assists in patient positioning. The fully-motorized arm easily pivots to accommodate a number of configurations, making it more comfortable for patients with complicated cases, such as wheelchair-based orthopaedic studies. The need to lift a patient from wheelchair to X-ray table is eliminated. ■



### Did you know ...

- Dr. Tsehla regularly speaks at Ukrainian radiology conferences. He's also Head of the Radiology Association of Crimea and author of 19 scientific papers.
- More than 60,000 patients come to Genesis Clinic annually to obtain a diagnosis and effective treatment of their illness. About 4,000 require surgery.
- Genesis Clinic consistently rates among the top 10 hospitals according to The Ukrainian National Rating of Healthcare Facilities.



# MUSICA

## The diagnosis is in the details.

Addressing the radiology department's need for high-quality, high-productivity image capture systems, we offer a rich portfolio of DR solutions empowered by MUSICA image processing software, from mobile to affordable and fully automated, high-performance DR rooms.

Insight. **Delivered.**

Learn about Agfa HealthCare at  
[www.agfahealthcare.com](http://www.agfahealthcare.com)