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EIBIR supports diagnostic imaging clinical studies SPECIFIC and MIPA

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EuroSafe Imaging Stars: University Hospital of Pisa

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Radiation protection: ESR turns focus on transposition of Euratom directive

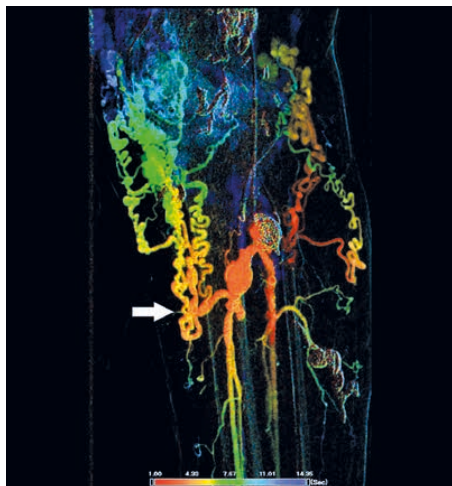
BY INGA STEVENS

# X-ray vendors put renewed emphasis on dose reduction, flexibility and cost-effectiveness

Aside from their never-ending quest to lower radiation dose, manufacturers of x-ray systems constantly strive for product innovations to increase flexibility, enhance workflow, and reduce cost. Technical advances continue to be made within this modality and attendees at ECR 2017 can witness them first hand in the technical exhibition.



Left: Supine view of abdomen before application of SimGrid. Right: supine view after SimGrid. (Provided by Samsung)



Parametric imaging assists with the visualisation of haemodynamic properties in interventional procedures. Time-density curve parameters are calculated for each pixel of a 2D-digital subtraction angiography image, and each pixel is colour-coded, based on the respective calculated values. (Provided by Toshiba)

**Toshiba Medical** is highlighting Ultimix-i at this week's congress. The multipurpose flat panel detector system is designed to enhance clinical versatility by facilitating routine gastrointestinal, urology, orthopaedic, and angiography examinations. The company is also introducing the Infinix-i Sky+ system, which reportedly delivers 3D imaging with 210° of anatomical coverage on both sides of the patient and a high-speed 3D rotation of 80° per second. The device also incorporates an extensive set of automated and user-selectable

DoseRite dose management tools designed to minimise exposure to patients and clinicians.

"Offering interventional radiology labs an imaging system that provides clinicians flexibility to perform a wide array of procedures, the ceiling mounted system features a unique double-sliding C-arm that allows it to be positioned faster, and in more ways, to help clinicians increase their coverage, speed and patient access," said René Degros, senior manager of the x-ray business unit at Toshiba Medical.

**Carestream** is showcasing the development of its DRX-Revolution Nano Mobile x-ray system at ECR 2017. Although not yet available for commercial sale, the product has fully integrated digital radiography workflow in a compact, lightweight design with low cost of ownership and features Carbon Nanotube technology that contributes to its smaller size and weight, according to the vendor.

Also on display is the second-generation Carestream DRX-Evolu-

tion Plus platform that can be configured with one or more wireless DRX Plus detectors. The platform reportedly features an innovative wall stand, an extended tube column for greater flexibility in high-ceiling rooms, a new high performance generator, and an optional table for larger patients.

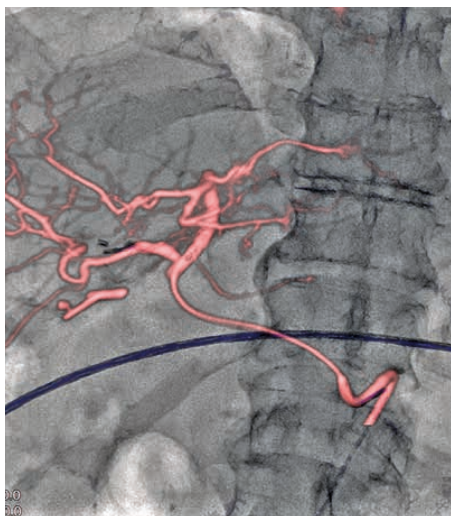
**Samsung** is demonstrating the GM85 premium mobile digital radiography system, which is said to have exceptional mobility and enhanced user convenience and high image quality. The unit has a narrow width of 555mm and a weight of 340kg, allowing easy access around tight spaces, while a collapsible column gives users clear visibility when moving the system and broadens access to smaller spaces, plus an adaptive soft-driving control and front-bumper sensor also helps make navigation safer, the company pointed out.

MX7, the newest version of the MobileDaRT Evolution series, is being showcased by **Shimadzu** at ECR 2017. The digital mobile x-ray system, equipped with a flat panel detector is especially suitable to examine patients during hospital rounds and for medical applications requiring a high level of urgency, such as emergency rooms and neonatal intensive care units, according to the vendor. The MX7 series offers a wide range of flat panel detector types to match individual clinical requirements, such as physical size, sensitivity and data transmission, particularly the 2.5kg, 14 x 17-inch device (SL-DR 21417S), it adds.

The scatter correction software used in the product reportedly enables more efficient work due to the elimination of grid misalignments, resulting in an image with reduced scatter and increased contrast, while the Smart seCURE integrated power management function allows users to select the best system for their clinical needs.

Another vendor with major announcements in the field is **Philips**, which is developing an augmented reality surgical navigation technology that is designed to help with image-guided open and minimally invasive spine surgery. The

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*Real-time volume navigation 3D roadmap with the Infinix-i system links movements of the C-arm and table position with the 3D fused volume and fluoroscopic display. Regardless of changes in the table position, source-image-distance, field-of-view, and C-arm angulation, the 3D overlay remains consistently aligned with the fluoroscopic image provided, according to Toshiba.*

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technology can boost the capabilities of the firm's low-dose x-ray system, using high-resolution optical cameras mounted on the flat panel x-ray detector to image the surface of the patient. It then combines the external camera view and the internal 3D view of the patient acquired by the x-ray system to construct a 3D augmented-reality view of the patient's external and internal ana-

tomy. Results from the first pre-clinical study have been promising.

On the **Agfa** booth, visitors can learn about Musica's Fractional Multiscale Processing technology for difficult bedside chest exams. Delivering acceptable image quality from bedside imaging can often be challenging for a technologist due to equipment and exposure limitations as well as patient pathology, according to a statement from the vendor.

"With the advent of mobile digital radiography systems, combined with an aging population, there has been a continual increase in the percentage of bedside (portable) chest radiographs carried out in hospitals. In some cases, up to 50% of in-hospital digital radiography procedures are now bedside chest exams," it noted. "Anti-scatter grids are normally recommended for use with chest radiography in order to improve image quality. Using grids can result in improved contrast detail by reducing the amount of scatter radiation reaching the detector. This is particularly true for medium to large-sized patients."

Meanwhile, **GE Healthcare** is continuing to develop its digital mobile x-ray system, the Optima XR240amx1 with FlashPad HD digital detectors. The product offers x-ray imaging support for carefully controlled neonatal environments like the Giraffe Carestation incubator, and its small tube design allows for easy positioning above the Carestation's canopy so the detector can slide directly into its base, GE explained.

Last but not least, **Siemens Healthineers** is promoting the Multitron Rax, a twin robotic x-ray scanner that is designed to combine high asset utilisation, new clinical insights, and less patient positioning and fewer transfers. Both robotic arms are ceiling-mounted and freely moveable around the room and the patient, and they allow projections from all angles, automated with robotic precision and alignment of tube and detector, the company pointed out.

Technical Exhibition  
Opening Hours  
Sunday, March 5 10:00-14:00

BY STEPHEN HOLLOWAY

## Where next for digital x-ray?

Digital, flat panel detector (FPD) radiography x-ray is today so dominant for new installations in European hospitals that it is challenging to find film-based x-ray on the ECR exhibition floor. However, with a vast array of apparently similar systems on offer, it has also become harder to detect where the market is headed. Here's my view on the key themes in digital x-ray to keep an eye out for.

	Driver	Outlook 2017-2020
<b>Mobile FPD DR</b>	Growing portfolio of value systems; large addressable market of legacy analogue systems	+++
<b>Interventional X-ray</b>	Replacement market; driven by dose safety and increase in minimally invasive procedures	+
<b>Flat Panel Detector DR</b>	Intensifying competition and declining panel pricing; still sizeable European installed base of analogue and CR for replacement	++

Source: Signify Research 2017

Comparison of main growth drivers for key DR x-ray markets in Europe.

### Mobile DR pushes into value segment

The rapid penetration of mobile DR x-ray systems is predicted to continue. Mobile DR has seen significant growth as the benefits and return on investment for providers in terms of efficiency and radiographer time are evident. Add to this steadily declining FPD pricing and a large installed base across Europe of ageing analogue mobile x-ray systems creates a strong driver for growth.

To capitalise on this, vendors are releasing a variety of new systems focusing on value, combining

previously high-end features such as touchscreens or untethered wireless panels, with lower-priced gadolinium oxide (GdOx) FPD within smaller, more mobile packages. These systems are then priced to compete against digital 'retrofit kits' that can convert analogue systems to DR, and a number allow optional upgrade to more expensive Caesium Iodide (CsI) FPDs at a later stage.

### Advanced dose monitoring for interventional x-ray

The interventional x-ray market has been buoyed by growing accep-

tance of interventional procedures and minimally invasive surgery in Europe. However, with increased use comes greater radiation dose scrutiny. The market is therefore already following the trend observed in CT, using new technology to more accurately monitor dose and optimise the balance between radiation dose and system performance for common procedures.

Traditionally dose calculation has been a rudimentary measure, but over time has become more tailored to each unique patient and procedure. New systems now

commonly include smarter dose tracking based on the exam being performed, patient attributes and automatic scan programme adjustment. Many of these features are also part of wider dose monitoring platforms for integrated use across different modalities, enabling seamless tracking of patient dose between departments.

Greater awareness of radiation dose added focus on clinician safety too, with many dose monitoring platforms focusing on physicians and clinical staff conducting procedures. In addition, vendors are increasingly offering clinical staff training to help raise awareness and drive best practice. While there are still significant improvements to be made in universal benchmarking of dose for the growing uses of interventional x-ray, recent dose advances look set to be a major driver of legacy interventional system upgrade in the next five years.

### FPD prices continue to tumble with competition

A quick tour of the exhibition floor will also highlight the continued proliferation of FPD vendors, especially from Asia. Price erosion of radiography detectors has ranged from 5-15% year-on-year in Europe for the past decade, making FPD more affordable and available. The quality and variety of models

available has also skyrocketed, with both GdOx and CsI detectors now available, wired and wireless, in a multitude of sizes. Many also now have improved battery life, support automatic exposure detection and have become increasingly robust to reduce the chance of damage.

Looking forward, as volumes of FPD installs steadily increase, price erosion will continue with intensified competition between the growing number of suppliers. OEM supply chains for major modality suppliers will also evolve with new market entrants and changes to upstream supply (such as the recent Varian Imaging division spin off to form Varex Imaging Corporation and market entry of LG Electronics). However, with FPD well established for DR, healthcare providers will be keenly scrutinising image quality and cost to ensure new DR systems are passing on the benefits of FPD market expansion.

Stephen Holloway is principal analyst and company director at Signify Research ([www.signifyresearch.net](http://www.signifyresearch.net)), a health tech, market-intelligence firm based in Cranfield, UK.