



# Imagine Now & Next

## Bridging the gap to the future of medical imaging

Mobile C-arm fluoroscopy systems are a widely known and well-established technology and have been successfully used for 20 years all over the world for surgical and therapeutic procedures. In recent years, fluoroscopy systems based on flat panel detectors (FPDs) have rapidly overtaken the traditional image intensifier (II) technology that was once predominant in the market and today, the majority of imaging departments in the UK use FPD-based systems.

### Size matters

The reason for this change in market dominance is the many advantages that FPD-based systems hold over traditional II platforms. For instance, IIs are large and cumbersome, and are difficult to store – due to the size of the II housing – making them impractical for departments with limited space. It is also more difficult to position them around the patient and in the operating room. In contrast, FPDs are thinner and lighter, with a more compact footprint, providing improved manoeuvrability during procedures, allowing greater access to the patient and making travel in and out of the operating room a less stressful experience.

### Quality counts

Typical II platforms also generate inferior image quality in comparison to the latest FPDs,<sup>1,2</sup> which do not exhibit the same geometric and S-distortion and inconsistent brightness levels that are seen with the traditional II technology. As a result, FPDs can use lower X-ray doses to achieve a sufficient image quality which, of course, is in the patient's best interests.<sup>1,2</sup> FPDs also have a high 16 bit dynamic range versus the IIs 12 bits, and have a higher detective quantum efficiency (DQE) and contrast, and a higher spatial resolution of 3.4 lp/mm compared to 1.7 lp/mm for II at full field.<sup>3</sup> This means they do not show the saturation or flare often observed with IIs, allowing all anatomical details – of both low and high absorption – to be seen on the same image without the need to adjust gain. Some FPDs are even capable of providing up to a 50 % larger field of view than II devices, giving better patient coverage.<sup>3,4</sup> Higher image quality and a lower dose for the patient are top priorities for any healthcare provider, especially when working with individuals who often require frequent or repeat examinations in the course of their treatment. These many strengths make FPDs the best choice for a wide range of clinical applications including radiography, urology, pain management, trauma, orthopaedic, vascular and general dynamic imaging.

## Crunching the numbers

The main perceived advantage of traditional II platforms is the lower purchase cost. However, in the long term, the financial burden of these systems may often be higher, as these systems require ever-increasing maintenance. System performance also fades rapidly,<sup>4,5</sup> since IIs exhibit drift and a degradation in sensitivity over time. These factors result in a lower useable lifespan compared to modern FPD systems – meaning that IIs need to be replaced more frequently, further increasing the total cost of ownership.<sup>2,4,5</sup> On the other hand, converting to FPDs is a worthwhile investment in the future, as they have a shorter image chain with fewer parts and lower maintenance requirements in the long run.<sup>2,3</sup>

## A stepping stone to the future

Despite the many proven benefits of FPD-based systems, uptake has not been universal, and this has largely been due to the financial barrier associated with the initial purchasing costs of these devices. The newly released FDX Visionary-CS Lite Mobile C-arm fluoroscopy solution (CS Lite) has been designed specifically to address this challenge, making FPD technology accessible to a wider range of facilities. The CS Lite fluoroscopy solution is a simpler and more focused version of the original FDX Visionary-CS Mobile C-arm fluoroscopy solution, and has been developed to help customers make the transition over to FPD systems and their benefits. The CS Lite fluoroscopy solution is a single compact and powerful mobile fluoroscopy system with high image resolution that can provide fluoroscopic imaging in a wide range of surgical and clinical applications.

The latest addition to the FDX Visionary system family is priced competitively – rivalling IIs for affordability – easily fitting within the budget of many imaging departments and medical institutions. There is now no reason not to take the leap and invest in the latest FPD technology to improve your workflow and enhance patient care.

For more information about our X-ray solutions, please visit: <https://www.fujifilm.com/de/en/healthcare/x-ray>

## References

1. Richter *et al.* 2018. **New advances in intra-operative imaging in trauma.** *EFORT Open Rev.* 3. doi: 10.1302/2058-5241.3.170055
2. Lee JL *et al.* 2021. Flat Panel Detector c-Arms Are Associated with Dramatically Reduced Radiation Exposure During Ureteroscopy and Produce Superior Images. *J Endourol* 35(6):789-794. doi: 10.1089/end.2020.0974. Epub 2021 Mar 24
3. **Siemens Medical Solutions. 2013. Dynamic Flat-Panel Detectors in Fluoroscopy, Technology and Clinical Advantages. [Whitepaper] USA**
4. Loft R. 2019. Flat Panel Detector Vs. Image Intensifier: What to Consider in a C-arm. Cassling. Accessed 13<sup>th</sup> January 2023. Available online at: <https://www.cassling.com/blog/flat-panel-detector-vs-image-intensifier-what-to-consider-in-a-c-arm>
5. Sharrock C. 2018. Flat panel detector c-arms vs. Image intensifier c-arms. Block Imaging. Accessed 13<sup>th</sup> January 2023. Available online at: <https://info.blockimaging.com/flat-panel-detector-c-arms-vs.-image-intensifier-c-arms>