

Zexira i9 is a new multipurpose fluoroscopy system with a small footprint which supports a wide range of examinations



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There is currently great interest in the phenomenon known as digital transformation (DX), which refers to the radical changes in society resulting from the widespread adoption of digital technologies. The field of radiology, which has a history extending back more than 100 years, is no exception to this trend. The Zexira i9 digital RF system is the direct result of Canon Medical Systems Corporation's efforts to develop an ideal RF system based on the latest digital technology.

The Zexira i9 system that entered service at Tokyo Women's Medical University Yachiyo Medical Center in August 2021 supports advanced acute care in the southern Tokatsu region of Chiba, Japan, which includes Yachiyo City, Ichikawa City, and Funabashi City. The medical center offers a wide range of examinations and procedures employing their Zexira i9, including gastrointestinal angiography as well as drainage and fistulography in the fields of gastroenterology and surgery, myelography and nerve root blocks in the field of orthopedics, bowel repositioning and voiding cystourethrography in the fields of pediatrics and pediatric surgery, and ureteral catheterization in the field of urology. We conducted interviews with Dr. Kei Imanishi (a physician in the Department of Gastrointestinal Surgery) and Mr. Michio Nakayama (Chief, Radiologic Technologist, Imaging Exam Room, Department of Medical Technology) and asked them to share their clinical experience with the Zexira i9 installed at their medical center.



Figure 1: From left: Yuri Yoshino (Radiologic Technologist), Michio Nakayama (Chief, Radiologic Technologist, Imaging Exam Room, Department of Medical Technology), Kei Imanishi (Physician), Yuriko Demura (Radiologic Technologist), and Nobuyuki Kawai (Chief Radiologic Technologist)

Zexira i9 revolutionizes the fluoroscopy environment, improving the safety of procedures performed in a wide examination space.

As for their reasons for selecting Zexira i9, Mr. Nakayama explains, "Examinations using X-ray fluoroscopy are expanding from pediatrics to orthopedics as well as to urology. Considering the wide range of clinical applications beyond a C-arm used exclusively for endoscopy, we decided that we needed a system offering outstanding convenience, comfort, and safety in all fluoroscopic procedures. We selected Zexira i9 because of its compact size, excellent fluoroscopic image quality, and advanced functions such as i-fluoro."

The previous system had a large main unit and was therefore installed parallel to the control room, which severely limited the amount of free space in the examination room, interfering with the positioning of other equipment and hindering the easy movement of medical staff. Mr. Nakayama explains, "The available space was so small that patients on beds had to be brought in through the front room, which severely disrupted our workflow. In addition, the working area around the patient table was extremely limited, with only a small area for the surgeon to stand and a cramped workspace for performing puncture procedures. It was a really tight squeeze for other medical staff as well."

Because Zexira i9 is designed so it can be placed against the wall with a total footprint depth as small as 173 cm, it was possible to install the system perpendicular to the control room, freeing up a large area in front of the system. This arrangement also resulted in much more open space for bringing in patients on beds or stretchers. Mr. Nakayama commented, "With Zexira i9, the examination room looks a lot more spacious. It's really improved the workflow efficiency of the operators and other medical staff."



Figure 2: Multipurpose X-ray fluoroscopy room with Zexira i9

i-fluoro The field of view (FOV) can be moved without repositioning the patient table or the imaging system.

Zexira i9 is provided with the new i-fluoro function. With i-fluoro, the FOV in magnified display can be moved without the need to physically reposition the patient table or the imaging system (X-ray tube assembly and FPD). Within an initially set 43 cm range, the magnified FOV can be displayed and freely moved to any desired position. The FOV can be moved more safely because there is no need to reposition the patient table or the imaging system during procedures such as needle puncture or drainage. Mr. Nakayama states, "Repositioning the imaging system or the patient table in order to move the field of view during an invasive procedure is risky, and it's also stressful to the surgeon. In addition, the vibration caused by mechanical movement of the table may cause the patient to feel anxious or frightened. The ability to move the FOV without physically repositioning the patient table or the imaging system is a major benefit in actual clinical use."

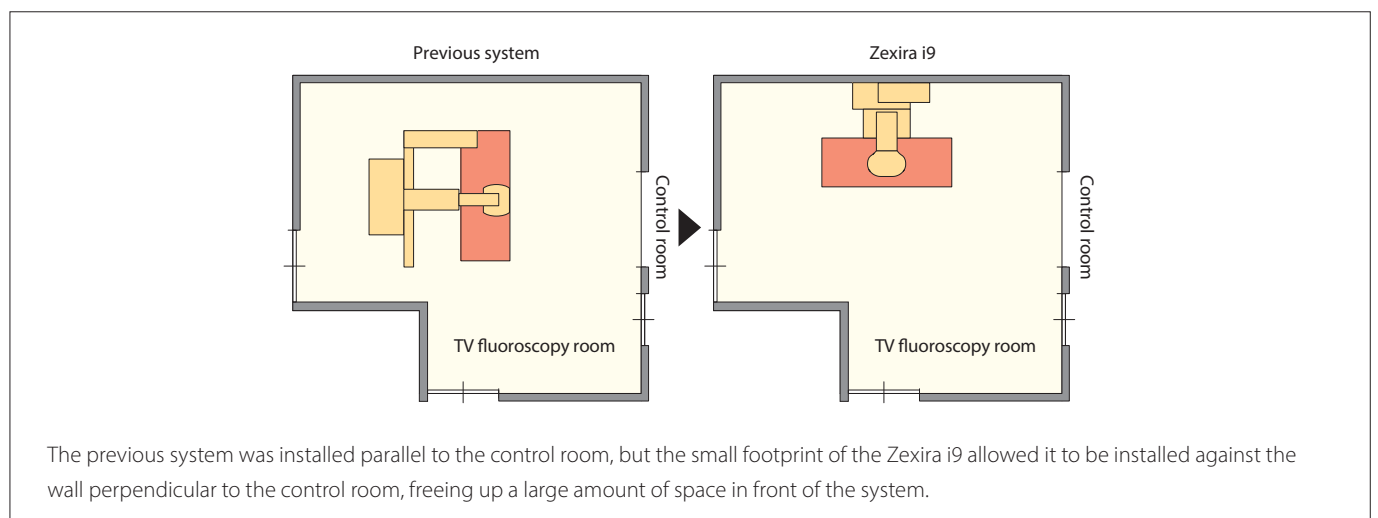


Figure 3: Change in the system layout in the multipurpose X-ray fluoroscopy room

Flexible examinations performed with i-fluoro

The FPD can be moved over a wide range up to 9 cm from the end of the table when the multipurpose patient table is installed in Zexira i9, providing an extensive radiography range of 205 cm in the head-to-foot direction. By using i-fluoro in combination to move the FOV, fluoroscopy can be performed over a wide range, including areas near the end of the table. This greatly increases the amount of freedom in

positioning, reducing the burden on both the operator and the patient during procedures. Mr. Nakayama also states, "Urological contrast examinations are often performed with the patient in the lithotomy position. Because the field of view can easily be moved to the end of the table in Zexira i9, we can perform fluoroscopy with much less effort. It minimizes the need to reposition the patient. This also helps to reduce patient stress and discomfort."

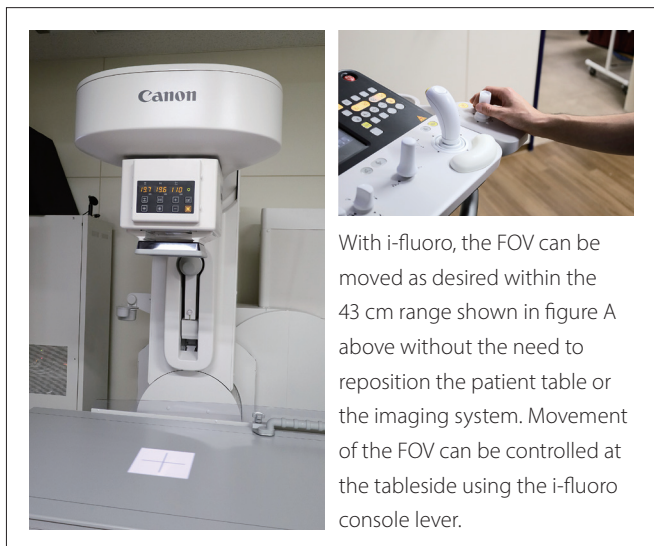


Figure 4: Moving the FOV with i-fluoro in Zexira i9



Figure 5: The FOV can be moved to a position 9 cm from the end of the table.

USE CASE

- ✓ Use case in the Department of Gastrointestinal Surgery
- ✓ Usefulness of i-fluoro for various puncture procedures in the field of gastroenterology



Dr. Kei Imanishi
Department of Gastrointestinal Surgery

In the Department of Gastrointestinal Surgery, Zexira i9 is used for upper gastrointestinal contrast examinations and for other contrast examinations such as barium enemas, as well as for fluoroscopic confirmation after intestinal tube placement. It is also used for puncture procedures such as central venous (CV) line and CV access port placement. We interviewed Dr. Kei Imanishi of the Department of Gastrointestinal Surgery and asked him to describe the changes he has observed since the introduction of Zexira i9.

- Current status of procedures performed under X-ray fluoroscopy guidance

Dr. Imanishi:

Due to the risks associated with incorrect insertion, puncture procedures for intra-abdominal cysts are always performed under X-ray fluoroscopy guidance, unless the lesion is located very close to the skin. It's really helpful to be able to clearly observe the tip of the needle or catheter over a wide view field in real time.

- Changes he has noted since the introduction of Zexira i9

Dr. Imanishi:

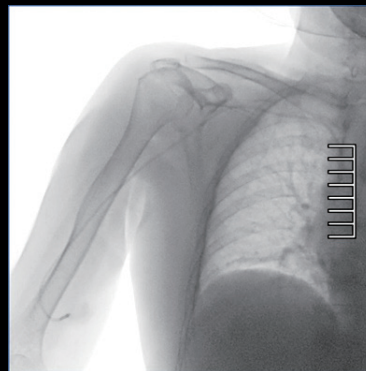
Because there's a lot more free space in the examination room, it's much easier to position and use ultrasound systems and physiological monitoring equipment. More than anything else, i-fluoro gives us greater freedom in positioning during procedures, allowing us to perform procedures more easily and with greater accuracy. Also, the superior image quality of

Zexira i9 helps to ensure that puncture procedures are performed more safely. The movements of the arm and table are extremely smooth, and the intuitive system operation also contributes to improved accuracy.

- Clinical usefulness of i-fluoro

Dr. Imanishi:

For example, the ability to freely move the FOV with i-fluoro is particularly useful during fluoroscopic PICC placement for CV catheterization because the patient's arm needs to be placed close to the edge of the table. Another advantage is that patients undergoing carotid artery catheterization procedures don't need to be repositioned or placed in uncomfortable positions.



By employing specialized image processing techniques developed for cardiovascular procedures, the entire length of the catheter extending from high-absorption areas to low-absorption areas (which would previously have been very difficult to visualize) can be clearly observed.

Figure 6: Fluoroscopic image immediately before removal of a CV access port.

Operating console that makes it easier to perform procedures

Fluoroscopic operations such as i-fluoro can be performed at the console in the examination room. The console can also be used to control the image display system, including pulsed fluoroscopy and dose mode switching, resulting in smoother operation and less radiation exposure. Mr. Nakayama notes, "System operation can be performed easily and intuitively at the console while observing the physician performing the procedure in the examination room. Console operability is really important because we need to ensure the lowest dose and highest image quality during all phases of the procedure."

Looking forward to the future of digital RF systems

In the future, Tokyo Women's Medical University Yachiyo Medical Center expects to further expand the range of clinical applications of Zexira i9 because it is an extremely flexible fluoroscopy system that can support a wide variety of examinations and procedures. Mr. Nakayama comments, "Zexira i9 expands what we can do far beyond the limits of conventional fluoroscopy systems. I look forward to having more opportunities for users like us to share our know-how with each other in the future." The new wave of X-ray fluoroscopy brought about by Zexira i9 is steadily growing.

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* The contents of this report include the personal opinions of the interviewees based on their clinical experience and knowledge.

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