

Please refer to the following websites for further information about pediatric imaging:

Alliance for Radiation Safety in Pediatric Imaging

www.imagegently.org

The Society for Pediatric Radiology

www.pedrad.org

U.S. Food and Drug Administration data on pediatric x-ray imaging

www.fda.gov

The aforementioned websites are solely responsible for their content. By providing links to these websites, Ziehm Imaging Inc. neither endorses, nor takes responsibility for, nor gives any guaranty of, the validity of their content. Ziehm has no affiliation with the websites or their content.

Contraindications to the use of X-rays: The exposure of humans to ionizing radiation must always be medically justified. Especially when used on pregnant women, adolescents, children, and pediatric patients, all procedures using ionizing radiation should be used with caution or avoided altogether. However, final decisions lie with the attending clinician.

In clinical practice, the use of SmartDose may reduce patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.

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SmartDose For Pediatrics

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SmartDose for Pediatrics
Best image quality.
Minimized dose.

As part of its commitment to improving patient care, Ziehm Imaging has incorporated SmartDose for Pediatrics in its Ziehm Vision RFD mobile C-arm products. With dose saving pulse technology, Ziehm Imaging is helping to set the benchmark in user-friendly adjustment of dose exposure, benefiting pediatric patients and staff.

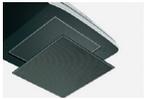
SmartDose for Pediatrics enables technologists to obtain optimal fluoroscopic exam results with minimal radiation by using dose reduction features, such as anatomical program region (APR) modifiers. The innovative features of SmartDose for Pediatrics reduce dose to children of all ages and stages of development, but are particularly valuable in neonate through pre-adolescent populations, which are often more susceptible to radiation effects.

Ziehm Imaging encourages technologists and imaging team members to become familiar with the dose-saving functions of the Ziehm Imaging C-arm, as well as situations in which these functions can be applied most effectively. Knowledge of pulsed fluoroscopy, the exposure rate of equipment, and the appropriate timing for specific dose-saving features can enable physicians and staff to reduce dose significantly.

12 Key Features of Pediatric SmartDose by Ziehm Imaging

At their discretion, technologists and imaging team members can use these 12 key features in any combination to further reduce a patient's dose exposure.

Removable Anti-Scatter Grid



Reduces technique dose for patients with thickness of 6 to less than 12 cm when grid is removed

Organ Program Selection



Automatically optimizes adjustment of pulse rate, pulse width, and image quality by anatomical region

Pediatric/Low Dose Modifier



Minimizes mA and optimizes kV by using the imaging system to enhance images and lower dose to the patient

Pulse Technology



Eliminates unwanted dose with short pulse widths and variable pulse rates

Pulse Rate Reduction



Decreases pulse rate to reduce the dose rate for lower accumulated dose

Laser Positioning Device



Laser cross hairs for accurate placement of C-arm without radiation

Virtual Collimation



Provides exposure-free, positioning of the collimators without radiation

PreMag



Provides exposure-free pre-magnification for a captured image

Object Detected Dose Control



Automatically analyzes the area of interest to minimize dose and optimize image

Fluoroscopic Image Store



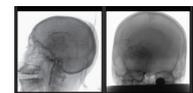
Captures and stores a single fluoroscopic image for review without continued radiation

Cine Loop Store



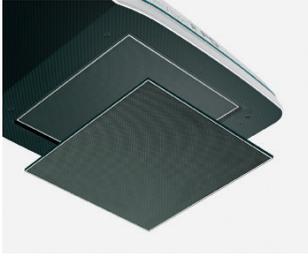
Automatically captures and stores cine loops for replay

Last Image Hold (LIH)



Automatically displays final image after completion of fluoroscopic event

01 / Removable Anti-Scatter Grid



By opening the two latches, an operator can remove the grid. This eliminates the need for radiation to penetrate the grid, reducing the technique dose required.

Recommended use: Patient thickness of 6 to less than 12 cm (neonates, newborns, infants, aged birth < 1 year).

02 / Organ Program Selection



Selecting an anatomical program region (APR) specific to each patient provides automated system adjustment of the

radiation dose profile, kV, mA, pulse width, pulses per second (p/s), and specified dose. Image filtration is automatically set to optimize noise reduction, improving image quality. For an additional reduction, the pediatric/low dose modifier can be selected. Further, the pulse rate (p/s) can be manually reduced, decreasing dose even more.

Recommended use: Essential to lowering dose and maintaining image quality in all exams. The pulse rate (p/s) can be manually reduced, further decreasing dose.

03 / Pediatric/Low Dose Modifier



Activating the pediatric/low dose modifier in combination with the organ program selection (see above) minimizes mA and optimizes kV while potentially modifying the specific techniques of the APRs, such

as the kV/mA curves. This optimization enhances the image at the lower pediatric dose levels.

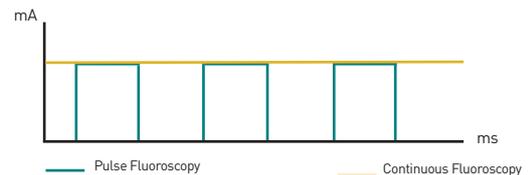
Recommended use: All pediatric patient exams where lowering clinical dose while maintaining image quality is essential. Pulse technology in combination with the pediatric/low dose modifier enables pulse rate control, further reducing accumulated dose.

04 / Pulse Technology



The pulse technology feature eliminates unwanted dose by using short pulse widths and variable pulse rates. This approach directly reduces the accumulated dose to patients.

Ziehm C-arms use pulse technology. Pulse technology in combination with the pediatric/low dose modifier will reduce the dose rate.



05 / Pulse Rate Reduction



The initial value of the exposure rate for the pediatric/low dose modifier is 25 p/s. The operator may override

the exposure rate by lowering the frame rates to 1, 2, 4, 8 or 12.5 p/s. In the bone extremities organ program, with the AUTO button activated, the pulse rate is reduced automatically if there is no motion in the image, resulting in a lower exposure rate. The lower the exposure rate, the lower the applied dose. However, frame rates lower than 8 p/s should be used with care since these rates may introduce motion artifacts.

Recommended use: All pediatric patient exams where lower clinical dose and clear images are essential. However, operators should consider that frame rates lower than 8 p/s may introduce motion artifacts. Since children have faster heart and respiration rates than adults, higher pulse rates may be

07 / Virtual Collimation

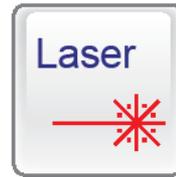


After capture of an initial exposure, the operator may adjust the position of the

collimators without additional radiation. Representative lines of the collimator blades are projected on the stored image on the screen, enabling precise alignment and eliminating the need to take an additional exposure. The collimators then limit the exposure to the region of interest.

Recommended use: Where additional exposure to patient is unnecessary and an operator would like to precisely limit the field of radiation exposure beyond the region of interest. Improves image quality and reduces exposure to patient.

06 / Laser Positioning Device



The laser positioning device is aligned to the central radiation beam at the crossing point, assisting an operator in aligning the beam to the center of the anatomical region of interest without initiating radiation.

Recommended use: When positioning the C-arm before initial radiation is activated. Eliminates unneeded exposure to localized anatomical regions.

08 / PreMag



An operator can adjust the magnification of an image on the screen to the

selected size without additional radiation. By pressing the magnify button several times, an operator can return to the original image without initiating additional radiation. If the premag is set at a smaller field of view (FOV) and an operator reinitiates radiation, the system automatically sets the FOV to the selected image's magnification size.

Recommended use: Whenever a physician determines the need to magnify smaller anatomical regions of a patient.

09 / Object Detected Dose Control (ODDC)



Object Detected Dose Control provides automatic adjustment of imaging parameters

and dose, resulting in dose-related savings. ODDC uses 256 measurement cells to continuously analyze the image. In the bone extremities organ program, motion detection automatically detects patient and system movement and will adjust the pulse rate accordingly. Object Detection will detect the position of the anatomy in the field of view and adjust the system settings accordingly. This allows for optimum imaging with suboptimum placement, even to the point of anatomy at the extreme edges of the image receptor.

Recommended use: Automatic with the pediatric/low dose modifier.

10 / Fluoroscopic Image Store



An operator may save a single fluoroscopic image from a live fluoroscopic sequence or the last image hold. The displayed static image on the monitor enables an operator to review the image without continued fluoroscopic radiation, which may be effective for pediatric dose saving. The image then can be stored to a Picture Archiving Communication System (PACS), USB or DVD.

Recommended use: Anytime the physician requires an image stored from a live fluoroscopic sequence or from Last Image Hold. This feature is available in all modes of the SmartDose for Pediatrics.

11 / Cine Loop Store

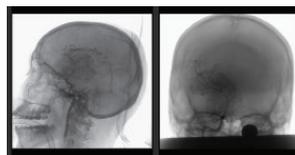


Select the cine fluoroscopy to automatically store cine loops for replay. Storage of a single fluoroscopic image from a live fluoroscopic sequence can be beneficial by enabling an

operator to study a displayed static image. This may assist an operator in reducing the fluoroscopic time and dose to a patient.

Recommended use: Most effective when used during exams where motion recording is indicated using the pediatric/low dose modifier, such as injections of contrast materials not requiring image subtraction.

12 / Last Image Hold (LIH)



Last image hold (LIH) is an automated feature and displays the final image upon completion of an irradiation event. This feature enables the operator to study a displayed static image after release of the exposure switch.

Recommended use: Always active and automatic at the end of all radiation terminations. Note: LIH may not always provide an acceptable image depending on how long the operator depresses the x-ray activation switch. Very short presses of the x-ray switch may lead to poor image quality.