

PAUSE AND PULSE - Contrast Enemas in Children – Tips for ALARA

PREPARATION PRIOR TO EXAMINATION:

- Clinical indication, appropriateness of study, questions to be answered, unusual anatomy or prior surgery, and type of study to be performed should be clarified as much as possible.
- Ensure that the technologist/trainee understands the planned procedure, requirements for appropriate immobilization (manual, wrapping or device), equipment and contrast needed (barium, water soluble agent or air). Close mentoring of technologist and physician trainees is essential throughout the study.

PATIENT PREPARATION:

- Explain procedure, risks and required immobilization to patient &/or parents,
 - a cooperative and helpful patient &/or parent can greatly shorten study and exposure.
- Supine overhead scout view usually obtained unless the child has a recent abdominal radiograph with decubitus or upright views as needed to evaluate for obstruction or free air.

PLACEMENT OF CATHETER: crucial for a short, efficient and successful procedure. There are many different catheter choices, including the appropriate size straight or acorn tip catheter or a Foley catheter generally with the balloon uninflated unless absolutely necessary. In infants particularly, it is helpful to make an external plug about 1-2 inches above the catheter tip by winding soft material tape around the catheter to a thickness of about 1/2inch. A thin anal occluder can be placed over the tip of the catheter proximal to the plug to help provide a tight and safe external anal seal. The external plug system has the additional advantage of controlling the internal location of the catheter tip preventing undesirable high placement of the catheter or balloon. Once the catheter is placed in the rectum, it is taped in place and the buttocks firmly taped together to prevent inadvertent loss of the catheter and aid with retention of the contrast.

FLUOROSCOPIC SYSTEM: Equipment should be regularly checked and maintained. Grid-controlled pulsed fluoroscopic unit with adjustable frame speeds and last image hold and capture capability highly desirable. Use the lowest pulse rate whenever possible. Remove antiscatter grid especially in smaller children. Ensure that fluoroscopic protective lead barriers on the tower unit are in place and place upper and lower lead shields under the patient as appropriate. Match tube output (kVp and mAs) to the size of the child. Make sure the timer is reset.

COLLIMATE / NO MAGNIFICATION: Bring the image intensifier tower as close as possible to the patient. Preset the collimators to the likely field of view and position the unit over the anatomic location of interest prior to beginning fluoroscopy. Adjust

collimation throughout the study to include the area of interest only excluding the gonads wherever possible. Image at lowest magnification; magnify only specific images if needed.

STEP LIGHTLY: Step lightly on the fluoroscopy pedal. Hand or foot controls, intermittent visualization only as needed. Depending on clinical indication may start looking at rectum in the lateral view and then most of the remainder of the study with the child supine or obliques as needed. Useful in children to follow the head of the contrast column saving screen images along the way. Keep fluoroscopy away from the pelvis and gonads as much as possible once the rectosigmoid has been imaged. PAUSE fluoroscopy whenever feasible and use screen images for exam planning and problem solving during the study.

IMAGES: Most images obtained during the study can be screen saves without any additional radiation. If more detail is needed some images can be camera spots with no need for cine or cassette film images. Images obtained depend on the clinical concern but will usually include frontal (possibly also lateral) rectum, rectosigmoid junction, splenic and hepatic flexures, cecum and terminal ileum. Postevacuation view/s can often be obtained as a fluoroscopic save or camera spot versus an overhead radiograph if needed.

FLUOROSCOPY TIME: Check fluoroscopic time used, permanent time/dose documentation as per the policy of hospital/ department

SUMMARY:

- **PAUSE** to properly plan and prepare for study
- **A**ctivate dose saving features of equipment
- **N**o exposures unless necessary
- **D**epress last image hold and last image grab instead
- **PULSE** at lowest possible rate

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