Ten Tips for Better Radiographs

By G. Patrick Thomas, Jr., DC, DACBR

1. Make sure your developer is fresh

Exhausted developer is one of the most common problems I encounter in private offices. Developer solution is what makes the exposed areas of x-ray film dark, and when it is weak leads to light films. Causes for exhausted developer include improper replenishment, exposure to air, and improper dilution. Fresh developer is light yellow and clear, while oxidized and exhausted developer is brown to nearly black. If your films are consistently light, check your developer first.

2. Use high-quality film

Quality radiographic film is expensive. For that expense, you spare yourself the troubles of lesser-quality film, such as fog, inconsistent speed, scratches and other artifacts. It has been my experience that these cheaper films often lead to more retakes, leading to increased patient exposure, increased film usage, increased and chemistry expenses. Cheap film may not be all that much more inexpensive than high-quality film.

3. Use rare earth screens

Rare earth screens are faster than their calcium tungstate predecessors. That increased speed and efficiency leads to reduced patient exposure. An added benefit is a consequence of reduced exposure times; you will significantly reduce your number of retakes due to patient motion.

4. Collimate

Beam restricting devices, such as collimators, are designed to reduce patient exposure, and improve image quality. By restricting the size of the exposure field, collimators reduce the amount of scattered radiation produced.

5. Use filters

Filters are used to compensate for anatomy that varies in thickness. For example, the upper thorax is much thinner than the lower thorax. The mAs needed to produce a diagnostic image of the lower thoracic spine is much greater than that needed for the upper thoracic spine. To make a high-quality AP radiograph of the entire thoracic spine, the mAs must be set high enough to properly expose the lower thoracic vertebrae, and a compensating filter should be used over the thinner upper thoracic region. Several companies offer such filter systems.

6. Use gonad shielding

Unless their use would obscure the anatomy of interest, gonad shields should be used for all patients of reproductive age. That means pre-menopausal females, and males up to 70 years of age.

7. Proper documentation

Each and every radiograph must have at least three pieces of information permanently affixed:

a. The patient's name or other form of identification
b. The date of the examination
c. The facility that performed the examination

Furthermore, you should keep a technical record of each radiographic examination performed, including patient name, date, view, SID, patient measurement, kVp, and mAs. This information has several uses:

a. It provides the details of the examination should it need to be repeated, preventing you from making the same mistake twice.
b. This information can be used to calculate patient exposure.
c. It also serves as additional evidence that the examination was actually performed.

8. Be consistent with technique

There are many variables that we select when performing radiography. Any combination of improper settings, or a singular miscalculation can lead to a "bad film". Occasionally, one can determine the fault by looking at the finished radiograph, but frequently we are left with only questions. By limiting the number of things we adjust during each examination, we can be more efficient at fixing problems.

For example, if we used a different source-image distance each time we did neutral lateral cervical view, it would be difficult to narrow down the cause of the resulting exposure problems. On common practice is to use different kVp's for the same view on different patients-usually higher power settings for thicker patients. While a more energetic beam does penetrate thicker tissue better than a weaker beam, it also affects the contrast of the finished film.

9. Maintain your equipment

Radiography equipment needs occasional attention, as well as routine maintenance to perform as intended. Modern x-ray machines are remarkably

trouble free considering their complexity. In my experience they either work fine, or not at all. Older units seem to be more prone to changes in calibration with time and may need more care in this regard.

Film processors, on the other hand, can be finicky and temperamental. When new they perform as expected, but with time and wear begin to show their true personalities. Warped rollers, bent guide shoes and broken pumps all come with age and cause a fair share of problems. Some of these arise from normal wear and tear, while others come from years of neglect and abuse. Regular cleanings and inspections, as well as preventative maintenance will contribute to a less turbulent relationship with your processor.

10. Repeat if necessary

Anything worth doing is worth doing properly. If the information you stand to gain from exposing your patients to ionizing radiation is important to you, then make sure that you gather the information you want. Don't hesitate to repeat an examination if needed.

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