

Q.A. Collectible

*Sponsored by CRCPD's Committee on Quality Assurance
In Diagnostic X-Ray (H-7)*

Processor Cross-Over Procedure

The cross-over procedure is an important part of a processor quality control program. This procedure is performed for processor evaluation when a facility is switching to a new box of quality control film. The purpose of the cross-over procedure is to adjust the operating levels on the control chart for differences between the emulsion batches of film. These differences in film may be changes in speed, contrast, or base + fog (B+F). Therefore, to account for the variability between emulsions and to more precisely monitor the chemical activity of the processor, adjustments to the established action limits may be necessary.

The cross-over procedure is detailed in the 1999 *Mammography Quality Control Manual* published by the American College of Radiology. The following points need to be remembered:

- The processor must be stable and in control (within the ≤ 0.10 control limits for speed and contrast).
- All the films required for the cross-over should be exposed and processed on the same day, alternating between the two emulsion batches. You can distinguish between the two film emulsion batches by cutting off the corners of the old batch films.
- The average of the steps (speed, contrast, and B+F) must be determined for the five films from the existing box of QC film and the five films from the new box.
- The operating levels on the control chart for speed, contrast, and B+F should be adjusted by the difference in average values between the old box and new box of film.
- The complete emulsion number of the new box of film should be recorded on the control chart.
- A notation should be made in the remark section of the control chart that a cross-over was performed.

There are common misconceptions associated with the cross-over procedure. The following explanations should help identify and resolve some of these issues:

- Cross-over procedure is necessary to make adjustments for slight differences in the sensitometric characteristics between different batches of film, not changes in processing.

- Cross-over should be performed all on the same day and at the same time of day processor QC is normally performed.
- The chemicals in the processor should be seasoned.
- The processing must be stable and in control.
- The test should be conducted before there are only five sheets of the old emulsion batch of QC control film.
- It is important that the facility QC personnel understand why cross-over is conducted and accept responsibility for the accurate maintenance of the QC program. In addition, if the differences between the two film emulsion batches are significant (in excess of the facility's own QC action limits), it should be brought to the film manufacturer's attention. ¹

¹ Gray, J.E., Winkler, N.T., Stears, J., and Frank, E.D. 1982. Quality Control in Diagnostic Imaging. University Park Press. Baltimore

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