

AbstractID: 1656 Title: Investigation of self-developing film for collimation assessment in digital mammography

Digital mammography introduces some new quality control challenges for the medical physicist. Conventional film and wet processing, traditionally used for collimation assessment, may not be available at the location where mammography is performed. We investigated two self-developing films as alternatives to conventional film for collimation assessment. Gafchromic XR Type T dosimetry media (ISP Technologies Inc.) and Polaroid Type 57 instant film (Polaroid Corporation) were evaluated in this investigation. X-ray sensitometry was performed to determine the air kerma necessary to achieve sufficient optical density for collimation assessment. Samples were positioned at key locations in the mammographic exposure field to allow measurement of radiation field boundaries. A 30 kVp Mo/Mo mammography spectrum was used for all measurements. The Gafchromic XR Type T film required 1.03 Gy incident air kerma to produce an optical density of 0.39, which provided sufficient contrast against the film's 0.35 OD base plus fog. For the Polaroid Type 57 film, an air kerma of 0.89 mGy produced a reflected optical density of 1.05 with a background optical density of 1.81. Collimation assessment was performed on a Lorad Selenia full-field digital mammography unit using both conventional mammographic film and Polaroid film. Results were consistent to within 2 mm including repositioning error. We conclude that Gafchromic XR Type T self-developing dosimetry media and Polaroid Type 57 instant film are suitable for use in collimation assessment. Because of its higher sensitivity, the Polaroid Type 57 film is the more practical choice.