

Key Ingredients of a Breast Imaging Fellowship—A Recipe for Success

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Abstract

Objective: In 2013, the ACR and Society of Breast Imaging created a curriculum to standardize the knowledge of graduates from breast imaging fellowships. Despite this, however, there remains a need to provide guidance to programs as to how to structure and organize the fellowship. In this article, we review key elements of a breast imaging fellowship to ensure that programs graduate radiologists that are well prepared to practice safely and independently. Such a program would provide a developmental framework using the Dreyfus model of skill acquisition. The training should be comprised of multiple and varied opportunities that promote active learning with appropriate supervision but progressive independence.

Summary: A successful fellowship program in breast imaging should embrace developmental milestones to ensure mastery of both basic and complex skills. Organized rotations, regular feedback, structured and self-directed learning activities, and participation in local, regional, and national meetings and organizations contribute to well-rounded graduates.

Key Words: Breast imaging fellowship, breast imaging, mammography, milestones

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INTRODUCTION

Similar to other medical specialties, fellowship training in breast imaging is predominantly apprenticeship style, with trainees learning “on the job.” In 2013, the ACR and Society of Breast Imaging created a curriculum for breast imaging fellowship to standardize knowledge of graduates [1]. As a non-ACGME program, these fellowships do not report to an accredited body and lack formal direction for how to structure and organize the fellowships. In this article, we review essential components to building a high-quality breast imaging fellowship program using elements from the ACGME model [2] (Table 1).

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SETTING THE STAGE FOR SUCCESS

Despite the ACGME and Mammography Quality Standards Act and Program requirements for diagnostic radiology residents to have 12 weeks in breast imaging, to interpret 240 mammograms in a 6-month period within their last 2 years of training, and to read at least 300 total mammograms during residency [2-4], breast imaging fellows begin their fellowship training with markedly different levels of experience in breast imaging. Attempts to guide and standardize residency training are under way, including a recent model provided by a group at the University of Virginia with milestone-based graduated rotation responsibilities [5] and an entrustable professional activities-breast imaging model that is being developed by a multi-institutional group of breast imaging radiology educators via an RSNA Educational Scholar Grant. However, differences in training remain and must be accounted for when designing the fellowship experience.

To address these inequities, it can be helpful to structure the fellowship into four-stages of developing expertise, which in practice corresponds to four quarters of the fellowship year. This approach parallels the educational milestones put forth by the Next Accreditation

Table 1. Key elements of a high-quality breast imaging fellowship

Key Elements
1. Structured program corresponding to stages of skill acquisition
2. Well-defined expectations and high-quality feedback
3. Well-rounded clinical rotation schedule
4. Exposure to mammography quality control
5. Participation in multidisciplinary conferences, and radiology-pathology correlation conferences, and journal clubs
6. Opportunity to complete a scholarly project
7. Interactive educational tools
8. Engagement in local and national radiology, and specifically breast imaging, organizations

System implemented for all ACGME-accredited programs [6]. The milestones are based on the Dreyfus five-stage model of skill acquisition, which begins at the novice level; progresses through advanced beginner, competency, and proficiency levels; and culminates at the expert level (Table 2) [7]. However, unlike residents, who are exposed gradually to imaging modalities and procedures based on milestone proficiency levels, fellows are exposed to all areas of breast imaging immediately. These fellowship stages, therefore, reflect an evolving expectation for how fellows should interact with the content rather than a curricular guide. We use this model to evaluate fellow progress (Appendix A), but more work should be done at the national level to further define breast imaging milestones.

Given that fellows have completed 4 years of residency, the fellowship begins at the advanced beginner level. This model can be adapted for shorter fellowships or for fellows who progress at different rates.

The First Quarter (Dreyfus Advanced Beginner Stage)

Given that many fellows are new to their respective programs, the first quarter should begin by introducing fellows to members of the team, systems within the breast imaging division, and the basics of how to interpret and report all types of breast imaging examinations. During this period, fellows learn how images are acquired while working with the mammography, ultrasound, and MRI technologists.

The Second Quarter (Dreyfus Competency Stage)

Once fellows are acclimated to their new institution, environment, and processes, they are ready to begin

applying what they have learned in a more consistent fashion. Fellows begin solidifying their foundation in breast imaging and gain competency in basic diagnostic cases and procedures during the second quarter.

The Third Quarter (Dreyfus Proficiency Stage)

The third quarter begins the period of “supervised independence.” The fellows have now learned rules and strategies to perform basic breast imaging and can begin to tackle more challenging cases, thinking critically about how they would manage the cases before seeking faculty input. This stage can result in anxiety for fellows, as they begin to take ownership of their cases and become aware of how much material they still need to learn. It is important for faculty to support their trainees through this period of growth.

The Fourth Quarter (Dreyfus Expert Stage)

This final quarter is an opportunity for fellows to function as mini-attending physicians, but with the continued oversight and support of the faculty. They can now approach and manage more complicated cases intuitively, providing reasonable justifications for their decision making. Completion of this stage allows graduates to practice independently and safely.

SETTING EXPECTATIONS AND PROVIDING FEEDBACK

One of the most important elements of a high-quality fellowship program is setting expectations early and providing constructive feedback at regular intervals throughout the year.

At our institutions, the fellowship director meets with incoming fellows on their first day of clinical service to review the schedule, clinical expectations, conference responsibilities, academic and educational requirements, and online educational resources. By discussing expectations early, program directors are engaging fellows to participate actively in their learning.

Feedback sessions should then occur at consistent intervals, at least quarterly, throughout the fellowship in a private setting [8]. The first session should be held close to the beginning of the fellowship year to ensure that there is a smooth transition into the program. During this time, the fellow can provide information on his or her previous clinical experience, including perceived strengths and weaknesses and desired goals for the program. During subsequent meetings, constructive feedback should be given by the program

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