

Guidelines for Musculoskeletal Imaging Fellowship

Introduction

In an effort to aid musculoskeletal (MSK) imaging fellowship programs in structuring a more comprehensive educational experience for their trainees, the current authors, members of the Fellowship Subcommittee of the Society of Academic Bone Radiologists (SABR) 2011, have developed this document. In addition, fellowship candidates seeking training programs may benefit from using this document when applying to and choosing a suitable program.

These guidelines are suggested only for those programs not accredited by the Accreditation Council for Graduate Medical Education (ACGME). The ACGME accredited programs have to follow the guidelines and rules set forth by the Council. Emphasis is also put on the wording and flexibility of this document so that programs can easily adjust their current modus operandi to these guidelines. This document does not intend to serve as rules and regulations for the programs, but rather is intended to provide recommendations for structuring a comprehensive fellowship experience.

This document is based in large part on the ACGME Requirements for Fellowship in Pediatric Radiology effective as of July 2010 and available on ACGME website. The current authors acknowledge that many elements and text segments have been directly adopted from this ACGME document.

General Definition of MSK Imaging Fellowship

1. A fellowship program in a subspecialty of diagnostic radiology is an educational experience of at least one year designed to develop advanced knowledge and skills in a specific clinical area.
2. The program should provide education in MSK multimodality imaging of patients and include learning the unique knowledge, techniques, communications and interpersonal skills to meet the needs of the patients and the referring physicians. At the completion of the fellowship, the fellow can be expected to apply his or her knowledge to appropriately image the common and rare, acute and chronic MSK diseases in a professional environment which is directed to the special needs of those served.
3. The program should provide fellows with an organized, comprehensive and supervised educational experience in MSK imaging. Didactics regarding indications and limitations of appropriate imaging techniques should be incorporated and can include plain radiography, computed tomography, magnetic resonance imaging, interventional techniques, sonography and any other imaging modality customarily included within the specialty. The program should further provide educational experience for the fellows in

various MSK subjects, such as (but not limited to): normal anatomy and variants, trauma/sports medicine, bone/soft tissue tumor and tumor-like conditions, spine imaging, arthropathy, infection, congenital anomalies and dysplasias, metabolic and hematologic disorders, and joint replacement.

Institutions

Sponsoring institutions

One sponsoring institution should assume ultimate responsibility for the program, and this responsibility extends to fellow assignments at all participating sites, if applicable. The sponsoring institution and the program should ensure that the program director has sufficient protected time and financial support for his or her educational and administrative responsibilities to the program.

Participating Sites

Regular communication between the program and participating sites is recommended. The following can be discussed during such periodic communication sessions:

- Identify the faculty who will assume both educational and supervisory responsibilities for fellows;
- Review their responsibilities for teaching, supervision, and formal evaluation of fellows (will be specified later in this document); and,
- Specify the duration and content of the educational experience.

It is our recommendation to have a MSK imaging fellowship program in institutions that sponsor a residency education program in diagnostic radiology accredited by the ACGME or are integrated by formal agreement into such programs. Close cooperation between the fellowship and residency program directors is recommended.

Alternatively the program can be offered in a free standing independent or private institution. An MSK Imaging fellowship program is considered free standing when it is not administratively linked to an accredited core residency program in diagnostic radiology.

Program Personal and Resources:

Program Director

There should be a single program director with authority and accountability for the operation of the program. The program director should spend at least 80% of his/her professional time in MSK imaging, and devote sufficient time to fulfill all responsibilities inherent in meeting the educational goals of the program.

It is understandable that the program director should have a requisite specialty expertise, a current radiology certification by the American Board of Radiology (ABR), a current medical licensure and appropriate medical staff appointment, and post-residency experience in the subspecialty area, including fellowship training and/or five years of practice experience in MSK imaging.

The program director should evaluate the fellows at least quarterly, and provide feedback at a periodic formal meeting with the fellow; select and supervise the fellows and work to comply with departmental and institutional guidelines concerning fellowship issues; work with the faculty to organize, continuously evaluate and improve the fellowship educational program; ensure that goals and objectives of specific rotations are distributed to the trainees and faculty. He or she should promote and regularly sponsor subspecialty conferences, interactive case based conferences, lectures, seminars and research activities.

Faculty

There should be a sufficient number of faculty with documented qualifications to instruct and supervise all fellows. The faculty should devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities and demonstrate a strong interest in the education of fellows. The physician faculty must have current ABR certification, medical licensure and appropriate medical staff appointment. The MSK imaging faculty should include, in addition to the program director, a minimum of one other full-time MSK radiologist. A ratio of at least 1 to 1.5 MSK radiologists for every fellow is recommended to provide adequate opportunity for teaching and supervision. The faculty should regularly participate in clinical discussions, journal clubs, clinical multi-disciplinary conferences, and research conferences.

Other program personal

The institution and the program should jointly ensure the availability of all necessary professional, technical, and clerical personnel for the effective administration of the program. A program coordinator should devote sufficient time to support the administration and educational conduct of the program.

Resources

The institution and the program should jointly ensure the availability of adequate resources for fellow education, as defined in the specialty program recommendations. The program should have appropriate facilities and space for the education of the fellows. There should be adequate study space, conference space and access to computers. I omitted this sentence entirely as it is subject to controversy. I think it was Mike Mulligan who noted on the paper print out that it is poorly worded and I agree.

Medical Information Resources

Fellows should have ready access to specialty-specific and other appropriate reference material in print or electronic format. Electronic medical literature database with research capabilities should be available.

Fellow Appointments

Eligibility Criteria

Prerequisite training for entry into an MSK imaging fellowship program should include the satisfactory completion of a diagnostic radiology residency program accredited by the ACGME or the Royal College of Physicians and Surgeons of Canada, or other radiology training judged to be acceptable to the program director.

Number of Fellows

The program's educational resources should be adequate to support the number of fellows appointed to the program. The presence of other learners (including, but not limited to residents from other specialties, subspecialty fellows, PhD students, and nurse practitioners) in the program should not interfere with the appointed fellows' education. The fellows should not dilute or detract from the educational opportunities available to residents in the core diagnostic radiology residency program, if applicable. Lines of responsibilities of the diagnostic radiology residents and the subspecialty fellow should be clearly defined. It is recommended that the training program has close interaction with a diagnostic radiology residency, if available. It is strongly encouraged that fellows should have shared experience with residents in orthopedics and with fellows in the MSK-related subspecialties (i.e., sports medicine, orthopedic oncology, rheumatology, etc.). The subspecialty program in MSK imaging should not have an adverse impact, such as by dilution of the available clinical material, on the education of the diagnostic radiology residents in the same institution.

Educational Program

It is our recommendation that the program integrates the following ACGME competencies into their educational curriculum:

A) Patient care

Fellows should be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. They:

- should have the opportunity to provide consultation with referring physicians or services;
- must follow standards of care for practicing in a safe environment, attempt to reduce errors, and improve patient outcomes;
- should have the opportunity to perform and interpret all exams and/or invasive procedures under close, graded responsibility and supervision.
- should assume direct and progressive responsibility in MSK imaging as they advance through training. This training should culminate in sufficiently independent responsibility for clinical decision making such that the program is assured that the graduating fellow has achieved the ability to execute sound clinical judgment.

B) Medical Knowledge

Fellows should demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social behavioral sciences, as well as the application of this knowledge to patient care. They:

- should demonstrate a level of expertise in the knowledge of those areas appropriate for a radiologist specialist.
- should develop skills in preparing and presenting educational material for medical students, graduate medical staff, and allied health personnel.
- should utilize appropriate imaging as it is applied to the clinical question.

C) Practice-based Learning and Improvement

Fellows are expected to develop skills and habits to be able to systematically analyze practice by using quality improvement methods, and implement changes with the goal of practice improvement. They

- should be able to locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems.

D) Interpersonal and Communication Skills

Fellows should demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients and health professionals. Fellows:

- should communicate effectively with patients, colleagues, referring physicians, and other members of the health care team concerning imaging and procedure appropriateness, informed consent, safety issues, and the results of imaging tests or procedures.
- should show competence in oral communication judged through direct observation.
- should show competence in written communication judged on the basis of the quality and timeliness of dictated reports.

The program should include learning techniques that improve understanding of cultural, economic and intellectual/educational differences. Fellows should help plan and present conferences. Fellows should be encouraged to attend available departmental or interdepartmental conferences dedicated to MSK imaging.

E) Professionalism

Fellows should demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Fellows should demonstrate:

- compassion, integrity, and respect for others;
- responsiveness to patient needs;
- respect for patient privacy and autonomy;

- accountability to patients, society and the profession; sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;
- compliance with institutional and departmental policies (HIPAA, the Joint Commission, patient safety, infection control, etc).

F) System-based Practice

Fellows should demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

- Fellows are expected to work in interprofessional teams to enhance patient safety and improve patient care quality; to participate in identifying system errors and implementing potential systems solutions.
4. The MSK imaging fellowship program should provide adequate exposure to the various imaging and interventional techniques such as radiography, CT, MRI, ultrasound, nuclear scintigraphy/PET, diagnostic and therapeutic aspiration and injections, percutaneous biopsy, and bone mineral density. In addition, the program should ensure adequate exposure to MSK topics such as normal anatomy and variants, trauma/sports medicine, bone/soft tissue tumor and tumor-like conditions, spine imaging, arthropathy, infection, congenital anomalies and dysplasias, metabolic and hematologic disorders, and joint replacement.
- - At the discretion of the program director, each fellow may elect to take a set amount of time (e.g. one month) of training in an elective radiology subspecialty area.
 - Fellows should participate on a regular basis in scheduled conferences. Conferences should provide for progressive fellow participation. Scheduled presentations by fellows should be encouraged. These conferences may include: intradepartmental conferences, departmental grand rounds, interdisciplinary conference, peer review case conference and/or morbidity and mortality conference
 - Fellows should be encouraged to attend and participate in local conferences and at least one national meeting or post graduate course in MSK imaging while in training. Participation in local or national subspecialty societies should be encouraged. Reasonable expenses should be reimbursed.
 - Fellows should attend didactic conferences directed to the level of the fellow that provides formal review of the topics in the specialty curriculum.

Fellows' Scholarly Activities

The program should provide instruction in the fundamentals of experimental design, performance, and interpretation of results.

All fellows should engage in a scholarly project. This project may take the form of laboratory research, clinical research, analysis of disease processes, imaging techniques, resident or fellow education or practice management issues. The results of such projects should be submitted for publication or presented at local, regional, national or international meetings.

Evaluation

Fellow Evaluation

Faculty should evaluate fellow performance in a timely manner. We suggest that the program provide objective assessments of competence in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems based practice (i.e. ACGME competencies). The program should use multiple evaluators, when possible (e.g., faculty, peers, patients, self, and other professional staff).

There should be at least a quarterly review of fellows' performance which should include:

- Review of faculty's evaluations of the fellow,
- Review of the procedure log, when applicable,
- Review of compliance with institutional and departmental policies (HIPAA, the Joint Commission, patient safety, infection control, etc),
- Review of procedural competencies or other simulation learning.

The evaluations of fellow performance should be accessible for review by the fellow, in accordance with institutional policy.

The program director may provide a summative evaluation for each fellow upon completion of the program. This evaluation may become part of the fellow's permanent record maintained by the institution, and should be accessible for review by the fellow in accordance with institutional policy. This evaluation should document the fellow's performance during their education, and verify that the fellow has demonstrated sufficient competence to enter practice without direct supervision.

Faculty Evaluation

At least annually, the program should evaluate faculty performance as it relates to the educational program. These evaluations should include a review of the faculty's clinical teaching abilities, commitment to the educational program, clinical knowledge, professionalism, and scholarly activities. These evaluations should include a written confidential evaluation by the fellows. Faculty should receive annual feedback from these evaluations.

Program Evaluation and Improvement

The program should systematically evaluate the fellowship experience at least annually. The program should monitor and track each of the following areas:

- Fellow performance, and
- Faculty development.
- If deficiencies are found, the program should suggest initiatives to improve performance in fellow performance and faculty development. These initiatives should be reviewed by the teaching faculty.

Fellows Duty Hours

Duty hours in the Learning and Working Environment

The program must be committed to and be responsible for promoting patient safety and fellow well-being and to providing a supportive educational environment. Duty hour assignments must recognize that faculty and fellows collectively have responsibility for the safety and welfare of patients. The responsibility or independence given to fellows should depend on their knowledge, skills, and experience.

The program must ensure that qualified faculty provides appropriate supervision of fellows in patient care activities. Duty Hours (as defined in the ACGME Glossary) are defined as all clinical and academic activities related to the program; i.e., patient care (both inpatient and outpatient), administrative duties relative to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled activities, such as conferences. Duty hours do not include reading and preparation time spent away from the duty site.

Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities. Fellows must be provided with one day in seven free from all educational and clinical responsibilities, averaged over a four-week period, inclusive of call. Adequate time for rest and personal activities must be provided. This should consist of a 10-hour time period provided between all daily duty periods and after in-house call.

On-call Activities

In-house call must occur no more frequently than every-third-night, averaged over a four-week period. Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Fellows may remain on duty for up to six additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medical and surgical care. During this time, fellows may complete call activities and participate in read-out sessions with faculty of the previous night's cases.

No new patients may be accepted after 24 hours of continuous duty. A new patient is defined as reading a new study or participating in an interventional procedure on a patient for whom the fellow has not previously provided care.

At-home call (or pager call)

The frequency of at-home call is not subject to the every third-night, or 24+6-hour limitation. However at-home call must not be so frequent as to preclude rest and reasonable personal time for each fellow. Fellows taking at-home call must be provided with one day in seven completely free from all educational and clinical responsibilities, averaged over a four-week period.

When fellows are called into the hospital from home, the hours fellows spend in-house are counted toward the 80-hour limit.

Moonlighting

Internal moonlighting must be considered part of the 80-hour weekly limit on duty hours. Moonlighting must not interfere with the ability of the fellow to achieve the goals and objectives of the educational program.

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