

**Program Requirements
For Graduate Medical Education in
Musculoskeletal Oncology**

Common Program Requirements are in Bold
Subspecialty Specific Requirements are Not Bolded

I. Introduction

A. Definition and Scope of Subspecialty

Musculoskeletal oncology is the component of orthopaedic surgery that is focused on the diagnosis and treatment of children and adults with benign and malignant tumors of bone and connective soft tissues. The field also includes the diagnosis, treatment, and palliative care of patients with metastatic carcinoma to the skeleton. Musculoskeletal oncologists work in concert with experts from musculoskeletal radiology, pathology, medical and pediatric oncology, radiotherapy, and surgery to care for patients with sarcomas of bone and soft tissue.

B. Duration and Scope of Education

Postgraduate fellowship education in orthopaedic surgery is a component in the continuum of the educational process, and such education should take place after completion of an accredited residency. Graduate medical education programs in the subspecialties of orthopaedic surgery will be accredited to offer 12 months of education.

II. Institutions

A. **Sponsoring Institution**

One sponsoring institution must assume ultimate responsibility for the program, as described in the Institutional Requirements, and this responsibility extends to fellow assignments at all participating institutions.

1. Postgraduate fellowship programs in the subspecialties of orthopaedic surgery may be accredited in institutions which sponsor accredited residency programs in orthopaedic surgery or which are affiliated with an orthopaedic surgery residency accredited by the Accreditation Council for Graduate Medical Education (ACGME). Requests for exceptions to this policy will be reviewed on a case-by-case basis.

2. When orthopaedic residents and fellows are being educated in the same institution, the residency director and the director of the fellowship must jointly prepare and approve a written agreement specifying the educational relationship between the residency and fellowship programs, the roles of the residency and fellowship directors in determining the educational program of residents and fellows, and the roles of the residents and fellows in patient care.
3. There must be close monitoring of the relationship between residency and fellowship education. It is imperative that orthopaedic fellowship education not interfere with the education of residents. Lines of responsibility for the orthopaedic resident and the fellow must be clearly defined. In addition, the fellow should maintain a close working relationship with orthopaedic residents and other fellows in orthopaedic surgery and in other disciplines.
4. Programs must provide an intellectual environment for acquiring the knowledge, skills, clinical judgment, and attitudes essential to the practice of the subspecialty. This objective can be achieved only when the program director, the supporting faculty and staff, and the administration are fully committed to the educational program and when appropriate resources and facilities are present. Effective graduate education is not achieved when the educational program functions primarily to meet service commitments.

B. Participating Institutions

1. **Assignment to an institution must be based on a clear educational rationale, integral to the program curriculum, with clearly-stated activities and objectives. When multiple participating institutions are used, there should be assurance of the continuity of the educational experience.**
2. **Assignment to a participating institution requires a letter of agreement with the sponsoring institution. Such a letter of agreement should:**
 - a) **identify the faculty who will assume both educational and supervisory responsibilities for fellows;**
 - b) **specify their responsibilities for teaching, supervision, and formal evaluation of fellows, as specified later in this document;**
 - c) **specify the duration and content of the educational experience;**
and
 - d) **state the policies and procedures that will govern fellow**

education during the assignment.

III. Program Personnel and Resources

A. Program Director

- 1. There must be a single program director responsible for the program. The person designated with this authority is accountable for the operation of the program. In the event of a change of either program director or department chair, the program director should promptly notify the executive director of the Residency Review Committee (RRC) through the Web Accreditation Data System of the ACGME.**
- 2. The Program Director, together with the faculty, is responsible for the general administration of the program, and for the establishment and maintenance of a stable educational environment. Adequate lengths of appointment for both the program director and faculty are essential to maintaining such an appropriate continuity of leadership.**
- 3. Qualifications of the program director are as follows:**
 - a) The program director must possess the requisite specialty expertise, as well as documented educational and administrative abilities.**
 - b) The program director must be certified in the specialty by the American Board of Orthopaedic Surgery, or possess qualifications judged to be acceptable by the RRC.**
 - c) The program director must be appointed in good standing and based at the primary teaching site.**
- 4. Responsibilities of the program director are as follows:**
 - a) The program director must oversee and organize the activities of the educational program in all institutions that participate in the program. This includes selecting and supervising the faculty and other program personnel at each participating institution, appointing a local site director, and monitoring appropriate fellow supervision at all participating institutions.**
 - b) The program director is responsible for preparing an accurate statistical and narrative description of the program as requested**

by the RRC, as well as updating annually both program and fellow records through the ACGME's Accreditation Data System.

- c) **The program director must ensure the implementation of fair policies, grievance procedures, and due process, as established by the sponsoring institution and in compliance with the Institutional Requirements.**
- d) **The program director must seek the prior approval of the RRC for any changes in the program that may significantly alter the educational experience of the fellows. Such changes, for example, include:**
 - (1) **the addition or deletion of a participating institution;**
 - (2) **a change in the format of the educational program;**
 - (3) **a change in the approved fellow complement for those specialties that approve fellow complement.**

On review of a proposal for any such major change in a program, the RRC may determine that a site visit is necessary.

B. Faculty

- 1. **At each participating institution, there must be a sufficient number of faculty with documented qualifications to instruct and supervise adequately all fellows in the program.**
- 2. **The faculty, furthermore, must devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities. They must demonstrate a strong interest in the education of fellows, and must support the goals and objectives of the educational program of which they are a member.**
- 3. **Qualifications of the physician faculty are as follows:**
 - a) **The physician faculty must possess the requisite specialty expertise and competence in clinical care and teaching abilities, as well as documented educational and administrative abilities and experience in their field.**

- b) **The physician faculty must be certified in the specialty by the American Board of Orthopaedic Surgery, or possess qualifications judged to be acceptable by the RRC.**
 - c) **The physician faculty must be appointed in good standing to the staff of an institution participating in the program.**
- 4. The responsibility for establishing and maintaining an environment of inquiry and scholarship rests with the faculty, and an active research component must be included in each program. *Scholarship* is defined as the following:**
- a) **the scholarship of *discovery*, as evidenced by peer-reviewed funding or by publication of original research in a peer-reviewed journal;**
 - b) **the scholarship of dissemination, as evidenced by review articles or chapters in textbooks;**
 - c) **the scholarship of application, as evidenced by the publication or presentation of, for example, case reports or clinical series at local, regional, or national professional and scientific society meetings.**

Complementary to the above scholarship is the regular participation of the teaching staff in clinical discussions, rounds, journal clubs, and research conferences in a manner that promotes a spirit of inquiry and scholarship (e.g., the offering of guidance and technical support for fellows involved in research such as research design and statistical analysis); and the provision of support for fellows' participation, as appropriate, in scholarly activities.

- 5. Qualifications of the nonphysician faculty are as follows:**
- a) **Nonphysician faculty must be appropriately qualified in their field.**
 - b) **Nonphysician faculty must possess appropriate institutional appointments.**

C. Other Program Personnel

Additional necessary professional, technical, and clerical personnel must be

provided to support the program.

D. Resources

The program must ensure that adequate resources (e.g., sufficient laboratory space and equipment, computer and statistical consultation services) are available.

1. A sufficient number of new and follow-up patients must be available to ensure adequate inpatient and outpatient experience for each fellow without adversely diluting the educational experience of the orthopaedic surgery residents or the educational experience of residents in other specialties.
2. There should be broad support from other clinical specialties, including diagnostic and therapeutic radiology, pediatrics, nuclear medicine, pathology, psychiatry, surgery and its subspecialties, and medical oncology. Support of oncologic nursing, rehabilitation, nutrition, dietetic counseling, and social services, as well as physical and occupational rehabilitation is desirable.
3. Modern facilities to accomplish the overall educational program must be available and functioning. These include inpatient ambulatory care and laboratory resources. Specifically, there should be advanced pathology services, including electron microscopy and immunopathology; resources for nuclear medical imaging, magnetic resonance imaging, musculoskeletal angiography, computed tomography, and sufficient facilities for qualitative correlative studies.
4. The fellow must have day-to-day access to pathologists and to radiologists with recognized expertise in musculoskeletal pathology and radiology.
5. On-site radiation and medical oncology facilities and a modern diagnostic radiologic service are necessary.
6. It is desirable that there be other clinical subspecialties of orthopaedic surgery and general surgery to which the orthopaedic oncology fellow may relate formally, as well as special facilities for musculoskeletal pathology.
7. There must be a minimum of 300 new patients per fellow of benign and malignant bone and soft-tissue tumors with an appropriate mix of primary and metastatic lesions to afford the fellow adequate educational experience in musculoskeletal oncology. This experience must include the care of both inpatients and outpatients.
8. Fellows must have ready access to a major medical library, either at the institution where the fellows are located or through arrangement with convenient

nearby institutions.

9. Library resources must include current and past orthopaedic periodicals and reference books which are readily accessible to all orthopaedic fellows in the program.
10. Library services should include the electronic retrieval of information from medical databases.
11. There must be access at each institution participating in the program to an on-site library or to a collection of appropriate texts and journals. On-site libraries and/or collections of texts and journals must be readily available during nights and weekends.

IV. Fellow Appointments

A. Eligibility Criteria

The program director must comply with the criteria for fellow eligibility as specified in the Institutional Requirements.

B. Number of Fellows

The RRC will approve the number of fellows based upon established written criteria that include the adequacy of resources for fellow education (e.g., the quality and volume of patients and related clinical material available for education), faculty-fellow ratio, institutional funding, and the quality of faculty teaching.

C. Fellow Transfers

To determine the appropriate level of education for fellows who are transferring from another program, the program director must receive written verification of previous educational experiences and a statement regarding the performance evaluation of the transferring fellow prior to their acceptance into the program.

A program director is required to provide verification of education for fellows who may leave the program prior to completion of their education.

D. Appointment of Other Students

The appointment of fellows from other programs, residents or students must not dilute or detract from the educational opportunities available to regularly appointed fellows.

V. Program Curriculum

A. Program Design

1. Format

The program design and sequencing of educational experiences will be approved by the RRC as part of the review process.

2. Goals and Objectives

The program must possess a written statement that outlines its educational goals with respect to the knowledge, skills, and other attributes of fellows for each major assignment and for each level of the program. This statement must be distributed to fellows and faculty, and must be reviewed with fellows prior to their assignments.

B. Subspecialty Curriculum

The program must possess a well-organized and effective curriculum, both didactic and clinical. The curriculum must also provide fellows with direct experience in progressive responsibility for patient management. The program must provide training to develop clinical competence in the overall field of musculoskeletal oncology. Examples of knowledge and skill that are desirable include, but are not limited to, the following:

- The natural history of musculoskeletal neoplasia.
- A knowledge and understanding of musculoskeletal surgical pathology and diagnostic radiology.
- The management of treatment protocols.
- A knowledge of the indications for and limitations of surgery, radiation therapy, and chemotherapy in the treatment of musculoskeletal neoplasms.
- A knowledge of the methodology and techniques to perform creditable clinical and/or basic research in musculoskeletal oncology, to include epidemiology and statistics and design of clinical trials.
- The acquisition of teaching skills in musculoskeletal pathology and

oncology.

1. Didactic Components

- a) The academic component must emphasize a scholarly approach to clinical problem solving, self-directed study, teaching, development of analytic skills and surgical judgment, and research.
- b) The educational program must be based on a core curriculum that ensures appropriate instruction in the basic concepts of oncogenesis and molecular oncology, adult and pediatric oncology, immunology, and radiation oncology.
- c) There should be a weekly multi-disciplinary tumor conference involving pathologists and radiologists, as well as radiation, medical, and pediatric oncologists.
- d) Fellows and faculty must participate in a journal club which reviews current literature in medical, pediatric, and radiation oncology on at least a monthly basis.

2. Clinical Components

- a) The technical component should ensure the ability of the fellow to perform skillfully the procedures required for practice of the subspecialty.
- b) The program must offer supervised training in operative and other technical skills integral to musculoskeletal oncology. Instruction and experience must be sufficient for the fellow to understand the indications, risks, and limitations of the commonly-performed procedures in the subspecialty.
- c) Fellows must have the opportunity to provide consultation with faculty supervision, and should have clearly-defined educational responsibilities for residents, medical students, and allied health personnel. These teaching experiences should correlate basic biomedical knowledge with the clinical aspects of the subspecialty.
- d) Clinical experience must include opportunities to observe and to manage patients with a wide variety of clinical orthopaedic oncologic problems on both an inpatient and outpatient basis.

- e) The fellow must be given an opportunity to assume continuing responsibility for both acutely- and chronically-ill patients in order to learn the natural history of musculoskeletal neoplasia as well as the effectiveness of therapeutic programs. Fellow education must provide sufficient opportunity for independent clinical decision- making so that the program director and faculty are assured that the graduating fellow has achieved the ability to make sound clinical decisions.

C. Fellows Scholarly Activities

Each program must provide an opportunity for fellows to participate in research or other scholarly activities, and fellows must participate actively in such scholarly activities.

1. Fellows must participate in basic and/or clinical hypothesis-based research.
2. Fellows must learn to design, implement, and interpret research studies under supervision by qualified faculty.
3. The program must provide time and facilities for research activities by fellows.

VI. Fellow Duty Hours and the Working Environment

Providing fellows with a sound didactic and clinical education must be carefully planned and balanced with concerns for patient safety and fellow well-being. Each program must ensure that the learning objectives of the program are not compromised by excessive reliance on fellows to fulfill service obligations. Didactic and clinical education must have priority in the allotment of fellows' time and energy. Duty hour assignments must recognize that faculty and fellows collectively have responsibility for the safety and welfare of patients.

A. Supervision of Fellows

1. **All patient care must be supervised by qualified faculty. The program director must ensure, direct, and document adequate supervision of fellows at all times. Fellows must be provided with rapid, reliable systems for communicating with supervising faculty.**
2. **Faculty schedules must be structured to provide fellows with continuous supervision and consultation.**
3. **Faculty and fellows must be educated to recognize the signs of fatigue, and adopt and apply policies to prevent and counteract its potential**

negative effects.

B. Duty Hours

- 1. Duty hours 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.**
- 2. Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities.**
- 3. Fellows must be provided with 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call. *One day* is defined as 1 continuous 24-hour period free from all clinical, educational, and administrative duties.**
- 4. 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.**

C. On-call Activities

The objective of on-call activities is to provide fellows with continuity of patient care experiences throughout a 24-hour period. *In-house call* is defined as those duty hours beyond the normal work day, when fellows are required to be immediately available in the assigned institution.

- 1. In-house call must occur no more frequently than every third night, averaged over a 4-week period.**
- 2. Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Fellows may remain on duty for up to 6 additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medical and surgical care.**
- 3. No new patients may be accepted after 24 hours of continuous duty.**
- 4. *At-home call* (or *pager call*) is defined as a call taken from outside the assigned institution.**

- a) **The frequency of at-home call is not subject to the every-third-night limitation. At-home call, however, 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 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a 4-week period.**
- b) **When fellows are called into the hospital from home, the hours fellows spend in-house are counted toward the 80-hour limit.**
- c) **The program director and the faculty must monitor the demands of at-home call in their programs, and make scheduling adjustments as necessary to mitigate excessive service demands and/or fatigue.**

D. Moonlighting

- 1. **Because graduate medical education is a full-time endeavor, the program director must ensure that moonlighting does not interfere with the ability of the fellow to achieve the goals and objectives of the educational program.**
- 2. **The program director must comply with the sponsoring institution's written policies and procedures regarding moonlighting, in compliance with the ACGME Institutional Requirements.**
- 3. **Any hours a fellow works for compensation at the sponsoring institution or any of the sponsor's primary clinical sites must be considered part of the 80-hour weekly limit on duty hours. This refers to the practice of *internal moonlighting*.**

E. Oversight

- 1. **Each program must have written policies and procedures consistent with the Institutional and Program Requirements for fellow duty hours and the working environment. These policies must be distributed to the fellows and the faculty. Duty hours must be monitored with a frequency sufficient to ensure an appropriate balance between education and service.**
- 2. **Back-up support systems must be provided when patient care responsibilities are unusually difficult or prolonged, or if unexpected**

circumstances create fellow fatigue sufficient to jeopardize patient care.

F. Duty Hours Exceptions

An RRC may grant exceptions for up to 10% of the 80-hour limit to individual programs based on a sound educational rationale. Prior permission of the institution's GMEC, however, is required.

VII. Evaluation

A. Fellow

1. Formative Evaluation

The faculty must evaluate in a timely manner the fellows whom they supervise. In addition, the program must demonstrate that it has an effective mechanism for assessing fellow performance throughout the program, and for utilizing the results to improve fellow performance.

- a) Assessment should include the use of methods that produce an accurate assessment of fellows' competence in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.**
- b) Assessment should include the regular and timely performance feedback to fellows that includes at least semiannual written evaluations. Such evaluations are to be communicated to each fellow in a timely manner, and maintained in a record that is accessible to each fellow.**
- c) Assessment should include the use of assessment results, including evaluation by faculty, patients, peers, self, and other professional staff, to achieve progressive improvements in fellows' competence and performance.**

2. Final Evaluation

The program director must provide a final evaluation for each fellow who completes the program. This evaluation must include a review of the fellow's performance during the final period of education, and should verify that the fellow has demonstrated sufficient professional ability to practice competently and independently. The final evaluation must be

part of the fellow's permanent record maintained by the institution.

B. Faculty

The performance of the faculty must be evaluated by the program no less frequently than at the midpoint of the accreditation cycle, and again prior to the next site visit. The evaluations should include a review of their teaching abilities, commitment to the educational program, clinical knowledge, and scholarly activities. This evaluation must include annual written confidential evaluations by fellows.

C. Program

The educational effectiveness of a program must be evaluated at least annually in a systematic manner.

1. Representative program personnel (i.e., at least the program director, representative faculty, and one fellow) must be organized to review program goals and objectives, and the effectiveness with which they are achieved. This group must conduct a formal documented meeting at least annually for this purpose. In the evaluation process, the group must take into consideration written comments from the faculty, the most recent report of the GMEC of the sponsoring institution, and the fellows' confidential written evaluations. If deficiencies are found, the group should prepare an explicit plan of action, which should be approved by the faculty and documented in the minutes of the meeting.
2. The program should use fellow performance and outcome assessment in its evaluation of the educational effectiveness of the program. Performance of program graduates on the certification examination should be used as one measure of evaluating program effectiveness.
3. The program should maintain a process for using assessment results together with other program evaluation results to improve the program.

VIII. Experimentation and Innovation

Since responsible innovation and experimentation are essential to improving professional education, experimental projects along sound educational principles are encouraged. Requests for experimentation or innovative projects that may deviate from the program requirements must be approved in advance by the RRC, and must include the educational rationale and method of evaluation. The sponsoring institution and program are jointly responsible for the quality of education offered to fellows for

the duration of such a project.

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