

The Musculoskeletal Oncology Milestone Project

A Joint Initiative of

The Accreditation Council for Graduate Medical Education

and

The American Board of Orthopaedic Surgery



July 2015

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The Milestones are designed only for use in evaluation of the fellow in the context of their participation in ACGME-accredited residency or fellowship programs. The Milestones provide a framework for assessment of the development of the fellow in key dimensions of the elements of physician competency in a specialty or subspecialty. They neither represent the entirety of the dimensions of the six domains of physician competency, nor are they designed to be relevant in any other context.

Musculoskeletal Oncology Milestones

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Milestone Reporting

This document presents milestones designed for programs to use in semi-annual review of fellow performance and reporting to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME competencies organized in a developmental framework from less to more advanced. They are descriptors and targets for fellow performance as a fellow moves from entry into fellowship through graduation. In the initial years of implementation, the Review Committee will examine milestone performance data for each program's fellows as one element in the Next Accreditation System (NAS) to determine whether fellows overall are progressing.

For each period, review and reporting will involve selecting milestone levels that best describe a fellow's current performance and attributes. Milestones are arranged into numbered levels. Tracking from Level 1 to Level 5 is synonymous with moving from novice to expert in the subspecialty.

Selection of a level implies that the fellow substantially demonstrates the milestones in that level, as well as those in lower levels (see the diagram on page v).

Level 1: The fellow demonstrates milestones expected of an incoming fellow.

Level 2: The fellow is advancing and demonstrates additional milestones, but is not yet performing at a mid-fellowship level.

Level 3: The fellow continues to advance and demonstrate additional milestones, consistently including the majority of milestones targeted for fellowship.

Level 4: The fellow has advanced so that he or she now substantially demonstrates the milestones targeted for fellowship. This level is designed as the graduation target.

Level 5: The fellow has advanced beyond performance targets set for fellowship and is demonstrating "aspirational" goals which might describe the performance of someone who has been in practice for several years. It is expected that only a few exceptional fellows will reach this level.

Additional Notes

Level 4 is designed as the graduation *target* and *does not* represent a graduation *requirement*. Making decisions about readiness for graduation is the purview of the fellowship program director. Study of Milestone performance data will be required before the ACGME and its partners will be able to determine whether milestones in the first four levels appropriately represent the developmental framework, and whether Milestone data are of sufficient quality to be used for high-stakes decisions.

Examples are provided with some milestones. Please note that the examples are not the required element or outcome; they are provided as a way to share the intent of the element.

Some milestone descriptions include statements about performing independently. These activities must occur in conformity to the ACGME supervision guidelines, as well as institutional and program policies. For example, a fellow who performs a procedure independently must, at a minimum, be supervised through oversight.

Answers to Frequently Asked Questions about Milestones are available on the Milestones web page:
<http://www.acgme.org/acgmeweb/Portals/0/MilestonesFAQ.pdf>.

The diagram below presents an example set of milestones for one sub-competency in the same format as the ACGME Report Worksheet. For each reporting period, a fellow's performance on the milestones for each sub-competency will be indicated by selecting the level of milestones that best describes that fellow's performance in relation to the milestones.

Benign Bone Tumor — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Obtains history and performs basic physical exam Describes/interprets plain radiographs of lesion Orders appropriate imaging studies to evaluate lesion 	<ul style="list-style-type: none"> Performs an appropriate biopsy Provides non-operative treatment for benign bone tumors Performs non-operative management of surgical complications 	<ul style="list-style-type: none"> Identifies malignant transformation clinically and radiographically Performs basic surgical management of benign bone tumor (e.g., aneurysmal bone cyst [ABC], cyclophosphamide, methotrexate, and fluorouracil [CMF], periosteal chondroma) Provides surgical management of complications Manages disease progression or local recurrence with surgical or non-surgical techniques 	<ul style="list-style-type: none"> Performs complex surgical management of benign bone tumor (e.g., giant cell tumor, osteoblastoma, aggressive ABC) Manages unique complications in skeletally immature patients (e.g., physal closure) 	<ul style="list-style-type: none"> Participates in a clinical trial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Selecting a response box in the middle of a level implies that milestones in that level and in lower levels have been substantially demonstrated.

Selecting a response box on the line in between levels indicates that milestones in lower levels have been substantially demonstrated as well as some milestones in the higher level(s).

Metastatic Bone Lesion — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Recommends appropriate biopsy, including biopsy alternatives and appropriate techniques (e.g., understands role of open biopsy vs. needle biopsy) • Capable of performing prophylactic fixation based on diagnosis and risk (e.g., able to perform prophylactic intramedullary stabilization of femur, prophylactic bipolar hemiarthroplasty of the hip) • Capable of performing internal fixation on impending or actual pathologic fractures (e.g., able to perform intramedullary stabilization of pathologic femoral or humeral fracture, bipolar hip hemiarthroplasty for pathologic femoral neck fracture) • Capable of performing alternative surgical approaches to the destructive bone lesion (e.g., understands approaches to the hip for prosthetic reconstruction; understands approaches for resection of proximal humerus, distal femur, and proximal tibia) • Capable of surgical treatment of infection or wound breakdown 	<ul style="list-style-type: none"> • Performs surgical treatment on more complex periarticular metastatic bone lesions/pathologic fractures (e.g., femoral neck lesions with calcar involvement or additional diaphyseal lesions requiring long stem implant) 	<ul style="list-style-type: none"> • Performs resection and endoprosthesis reconstruction of periarticular lesions with substantial bone destruction • Performs evaluation of a patient with solitary bone metastasis and proceeds with appropriate surgical treatment 	<ul style="list-style-type: none"> • Discusses prognosis and end-of-life care with patients and family • Capable of planning and performing a periacetabular reconstruction • Surgically treats complex complications (e.g., hardware failure, periprosthetic fracture/infection, progression of disease) • Coordinates multidisciplinary care of patient (e.g., medical/pediatric oncology, radiation oncology) 	<ul style="list-style-type: none"> • Capable of performing surgical treatment of metastatic spine disease • Participates in clinical trials for medical and surgical treatment of metastatic bone disease
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Malignant Bone Lesion (Primary) – Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Obtains thorough history and performs basic and tumor-specific physical exam Orders and interprets findings on basic imaging studies Provides basic peri-operative management (e.g., intravenous [IV] antibiotics, deep venous thrombosis [VTE] prophylaxis, pain control) Manages non-surgical complications (e.g., VTE, pneumonia, neutropenia) Attends multidisciplinary treatment conference 	<ul style="list-style-type: none"> Manages treatment-related complications (e.g., neutropenia, infection/sepsis, radiation changes) Orders and interprets findings on complex imaging studies of local lesion and staging studies Performs an intra-operative needle or open biopsy Completes pre-operative planning (e.g., transfusion requirements, positioning, intra-operative imaging) Completes pre-operative planning for resection and reconstruction (e.g., implant selection, templating, level of resection) Performs as a first assistant on resection of malignant bone tumor Performs non-operative management of surgical complications Orders appropriate post-operative rehabilitation protocol 	<ul style="list-style-type: none"> Manages post-operative complications (e.g., infection, nonunion, fracture, wound breakdown) Manages situation of a poorly performed biopsy/unplanned resection Manages disease progression with or without surgery Performs basic oncologic amputations (e.g., below the knee amputation [BKA], above the knee amputation [AKA]) 	<ul style="list-style-type: none"> Discusses prognosis and end-of-life care with patients and family Coordinates multidisciplinary care of patient (e.g., medical/pediatric oncology, radiation oncology) Coordinates a multidisciplinary surgical team for tumor resection/reconstruction (e.g., plastic surgery, vascular surgery, general surgery, neurological surgery, urology) Capable of performing complex oncologic amputations (e.g., forequarter, hindquarter) Performs segmental resection and reconstruction of an appendicular primary bone tumor Manages intra-operative complications (e.g., bleeding, fracture, organ damage-bladder/bowel/lung/nerve/dura) Manages complex wounds with primary closure or local flaps Anticipates and treats unique complications in skeletally immature patients (e.g., limb length discrepancy) 	<ul style="list-style-type: none"> Capable of performing resection and reconstruction of a primary malignant bone tumor in the axial skeleton Design and implement basic science or translational protocols/investigations on diagnosis and/or treatment of malignant bone tumors Participates in a clinical trial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Malignant Soft Tissue Tumor — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Obtains thorough history and performs basic and tumor-specific physical exam Orders and interprets findings on imaging studies (ultrasound, magnetic resonance imaging [MRI]) Provides basic peri-operative management (e.g., IV antibiotics, VTE prophylaxis, pain control) Manages non-surgical complications (e.g., VTE, pneumonia, neutropenia) Attends multidisciplinary treatment conference 	<ul style="list-style-type: none"> Manages treatment-related complications (e.g., neutropenia, infection/sepsis, radiation changes) Completes pre-operative planning for transfusion requirements, positioning Performs an intra-operative needle or open biopsy Performs as first assistant on resection of soft tissue sarcoma Performs non-operative management of surgical complications Orders appropriate post-operative rehabilitation protocol 	<ul style="list-style-type: none"> Manages patient with a poorly performed biopsy Manages patient with a prior unplanned excision of a soft tissue sarcoma Performs basic oncologic amputations (e.g., BKA, AKA) Manages post-operative complications (e.g., infection, wound breakdown) Manages disease progression with or without surgery 	<ul style="list-style-type: none"> Discusses prognosis and end-of-life care with patients and family Coordinates multidisciplinary care of patient (e.g., medical/pediatric oncology, radiation oncology) Coordinates a multidisciplinary surgical team for tumor resection/reconstruction (e.g., plastic surgery, vascular surgery, general surgery, urology) Performs resection of an appendicular soft tissue sarcoma Capable of performing complex oncologic amputations (forequarter, hindquarter) Manages intra-operative complications (bleeding, organ damage-bladder/bowel/lung/nerve) Manages complex wounds or soft tissue defects with primary closure or local flaps 	<ul style="list-style-type: none"> Capable of performing resection of an axial/retroperitoneal soft tissue sarcoma Designs and executes basic science and translational studies/investigations for patients with soft tissue sarcoma Participates in a clinical trial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Benign Bone Tumor — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Obtains history and performs basic physical exam • Describes/interprets plain radiographs of lesion • Orders appropriate imaging studies to evaluate lesion 	<ul style="list-style-type: none"> • Performs an appropriate biopsy • Provides non-operative treatment for benign bone tumors • Performs non-operative management of surgical complications 	<ul style="list-style-type: none"> • Identifies malignant transformation clinically and radiographically • Performs basic surgical management of benign bone tumor (e.g., aneurysmal bone cyst [ABC], cyclophosphamide, methotrexate, and fluorouracil [CMF], periosteal chondroma) • Provides surgical management of complications • Manages disease progression or local recurrence with surgical or non-surgical techniques 	<ul style="list-style-type: none"> • Performs complex surgical management of benign bone tumor (e.g., giant cell tumor, osteoblastoma, aggressive ABC) • Manages unique complications in skeletally immature patients (e.g., physeal closure) 	<ul style="list-style-type: none"> • Participates in a clinical trial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Benign Soft Tissue Tumor — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Obtains history and performs basic physical exam • Describes and interprets imaging studies of lesion • Orders appropriate imaging studies to evaluate lesion 	<ul style="list-style-type: none"> • Perform an appropriate biopsy • Provides non-operative treatment for benign soft tissue tumors 	<ul style="list-style-type: none"> • Performs appropriate management of patients with complex vascular lesions • Provides basic surgical treatment of benign soft tissue tumors (excision) 	<ul style="list-style-type: none"> • Performs complex surgical treatment of aggressive benign soft tissue tumors (e.g., pigmented villonodular synovitis [PVNS], desmoid) • Manages complications related to surgical treatment of benign soft tissue tumors • Provides management of locally recurrent benign soft tissue tumors 	<ul style="list-style-type: none"> • Participates in a clinical trials
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Metastatic Bone Lesion — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Understands controversies within the field (e.g., resection/prosthetic reconstruction vs. intramedullary fixation; short vs. long stem hip reconstruction; bipolar vs. total hip arthroplasty [THA] for hip lesions; resection of solitary bone metastasis) Formulates differential diagnosis based on imaging studies Able to perform risk assessment of operative vs. non-operative care (e.g., understands concepts of nutritional status, current function/activity, medical comorbidities/American Society of Anesthesiologists [ASA] level) Applies understanding of natural history to clinical decision making (e.g., understands balance of expected lifespan to planned intervention [i.e., complex acetabular reconstruction for patient with widespread lung metastases and six weeks to live]; develops shared-decision making skills for patient discussions/interactions) Understands biomechanics and implant choices (e.g., understands concepts of failure in compression vs. tension; understands the benefit of supplemental methylmethacrylate; understands the pros/cons of plate vs. rod fixation) 	<ul style="list-style-type: none"> Recognizes the medical sequelae of advanced metastatic disease (e.g., hypercalcemia, anemia, mental status changes) Demonstrates understanding of advanced imaging techniques for staging and surveillance of patients with metastatic disease (e.g., fluorodeoxy glucose-positron emission tomography [FDG-PET], computed tomography [CT] scan, technetium bone scan) Understands the natural history and non-surgical treatment of multiple myeloma and lymphoma 	<ul style="list-style-type: none"> Understands the indications for non-operative (bisphosphonates, receptor activator of nuclear factor kappa-B ligand [RANKL] inhibitors) or minimally invasive techniques (e.g., radio frequency ablation [RFA], cryoablation, embolization, vertebroplasty, kyphoplasty) for management of symptoms Understands alternative radiation methods and dosages for disease control in bone (e.g., 8Gy vs. 30Gy, cyber knife, radiopharmaceuticals, proton therapy, stereotactic, intensity modulated radiation therapy [IMRT]) Understands natural history and disease-specific outcomes of patients with solitary metastasis to bone Understands the indications and options for non-operative treatment of metastatic spine disease 	<ul style="list-style-type: none"> Demonstrates knowledge of palliative care for patients with terminal disease (e.g., disease course, end-of-life discussions, pain management) Understands the indications for surgical treatment for patients with multiple myeloma and lymphoma Understands the indications and approaches for operative treatment of metastatic spine disease Understands multidisciplinary care of patient (medical/pediatric oncology, radiation oncology) 	<ul style="list-style-type: none"> Knowledgeable about invasive, minimally invasive, and non-invasive techniques in discovery phase of development Understands targeted pathways in the treatment of select tumor metastases (e.g., epidermal growth factor receptor [EGFR]-lung cancer, vascular endothelial growth factor receptor [VEGFR]-renal cancer, human epidermal growth factor receptor 2 [HER2]-breast cancer)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Malignant Bone (Primary) — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Demonstrates knowledge of specific malignant bone tumors • Correlates anatomic knowledge to findings on basic imaging studies (radiographs) and understands their indications in evaluation of primary bone tumors • Understands histologic appearance on light microscopy • Demonstrates knowledge of different methods of biopsy and when indicated • Demonstrates knowledge of bone tumor staging systems • Understands concept of surgical margins and relationship with local recurrence 	<ul style="list-style-type: none"> • Understands the natural history of primary malignant bone tumors • Demonstrates ability to generate a differential diagnosis based on imaging appearance • Demonstrates ability to generate a differential diagnosis based on histologic appearance • Understands the use of imaging and histologic data to identify tumor stage • Performs risk assessment and analysis of co-morbidities prior to treatment • Understands the indications for limb salvage vs. amputation 	<ul style="list-style-type: none"> • Understands the role of systemic chemotherapy and radiation therapy in treatment of malignant bone tumors, as well as details of specific protocols • Demonstrates use of various imaging modalities to determine extent of disease and pre-operative planning • Understands the tumor-specific immunohistochemical stains • Understands the role of non-operative treatment in certain cases • Demonstrates knowledge of various pain management strategies and modalities • Understands unique characteristics of skeletally immature patients, and implications of surgical resection and reconstruction • Formulates an appropriate surveillance plan post-operatively 	<ul style="list-style-type: none"> • Demonstrates knowledge of basic science of primary malignant bone tumors, including tumor suppressor genes, oncogenes, and their relation to targeted therapies • Understands the role of imaging in determining the response to treatment and recurrence of disease • Lists the tumor-specific molecular markers and understands the role of histologic necrosis in predicting outcome • Demonstrates knowledge of the major types of resection and reconstruction (e.g., prostheses, allografts, vascularized fibular grafts, rotationplasty) in children and adults for each tumor • Understand the complications related to surgical treatment (e.g., nonunion, infection, fracture, recurrence, wound healing) • Demonstrates knowledge of disease-specific outcomes (e.g., Ohtahara syndrome [OS], disease-free survival [DFS], locoregional recurrence-free survival [LRFS]) 	<ul style="list-style-type: none"> • Demonstrates understanding of translational research in the area of malignant bone tumors
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Malignant Soft Tissue Tumor — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Demonstrates knowledge of specific malignant soft tissue tumors • Correlates anatomic knowledge to findings on imaging studies (MRI) and understands their indications in evaluation of primary soft tissue tumors • Understands histologic appearance on light microscopy • Demonstrates knowledge of different methods of biopsy and when indicated • Demonstrates knowledge of soft tissue sarcoma staging systems • Understands concept of surgical margins and relationship with local recurrence 	<ul style="list-style-type: none"> • Understands the natural history of primary malignant soft tissue tumors • Demonstrates ability to generate a differential diagnosis based on imaging appearance • Understands the use of imaging studies to identify tumor stage • Demonstrates ability to generate a differential diagnosis based on histologic appearance • Understands the indications for limb salvage vs. amputation 	<ul style="list-style-type: none"> • Understands the indications for and types of multimodal treatment • Performs risk assessment and analysis of co-morbidities prior to treatment • Understands the role of systemic chemotherapy in treatment of malignant soft tissue tumors, as well as details of specific protocols • Understands the role of radiation therapy in the treatment of malignant soft tissue tumors in adults and children (e.g., dosage, pre- vs. post-, modalities) • Understands the implications of unplanned excision and poorly done biopsy • Demonstrates use of various imaging modalities to determine extent of disease and pre-operative planning • Understands the tumor-specific immunohistochemical stains • Formulates an appropriate surveillance plan post-operatively 	<ul style="list-style-type: none"> • Demonstrates knowledge of basic science of primary malignant soft tissue tumors, including tumor suppressor genes, oncogenes, and their relation to targeted therapies • Lists the tumor-specific molecular markers • Understands the complications related to radiation (e.g., fibrosis, wound breakdown, poor healing, post-radiation sarcoma) • Understands the radiographic parameters of tumor response after neoadjuvant treatment • Demonstrates understanding of the indications for local, rotational, or free soft tissue reconstruction • Understands the complications related to surgical treatment (e.g., infection, recurrence, wound healing) • Understands the role of imaging in identification of disease recurrence • Demonstrates knowledge of disease-specific outcomes (e.g., OS, DFS, LRFS) 	<ul style="list-style-type: none"> • Demonstrates understanding of translational research in the area of soft tissue sarcomas
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Benign Bone Tumor — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Demonstrates knowledge of specific benign bone tumors • Correlates anatomic knowledge to findings on basic imaging studies (e.g., plain radiographs) and understands their indications in evaluation of benign bone tumors • Understands histologic appearance on light microscopy • Demonstrates knowledge of different methods of biopsy and when indicated 	<ul style="list-style-type: none"> • Understands the natural history of benign bone tumors • Demonstrates ability to generate a differential diagnosis based on imaging appearance • Understands the use of imaging studies to identify tumor aggressiveness • Demonstrates ability to generate a differential diagnosis based on histologic appearance • Understands the indications for surgical vs. non-operative treatment of benign bone tumors • Demonstrates knowledge of appropriate surveillance regimens (e.g., type of imaging, frequency) • Understands the patterns of multifocal benign bone disease (e.g., polyostotic fibrous dysplasia, Langerhan's cell histiocytosis, multicentric giant cell tumor of bone) 	<ul style="list-style-type: none"> • Demonstrates use of various imaging modalities to determine extent of disease and pre-operative planning • Understands the tumor-specific immunohistochemical stains • Demonstrates knowledge of medical genetics of syndromes and dysplasias involving benign bone lesions present in children and adults • Understands the risk of malignant transformation or metastasis of certain benign bone tumors • Understands the incidence of local recurrence, and indications for treatment 	<ul style="list-style-type: none"> • Lists the tumor-specific molecular markers in benign bone tumors • Demonstrates knowledge of the various nonsurgical treatments of benign bone tumors (e.g., chemotherapy for advanced Langerhan's cell histiocytosis [LCH], RFA for osteoid osteoma) • Demonstrates knowledge of the indications and types of surgical treatment (e.g., intralesional vs. resection) • Demonstrates knowledge of the various surgical adjuvants (e.g., phenol, cryoablation, argon beam, high speed burr) • Understands the complications related to surgical treatment • Understands the role of imaging in determining recurrence of disease • Demonstrates knowledge of surgical outcomes 	<ul style="list-style-type: none"> • Develops independent research project related to benign bone tumors (e.g., pathogenesis of benign bone tumors, treatment efficacy, complications)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Benign Soft Tissue Tumor — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Demonstrates knowledge of specific benign soft tissue tumors • Correlates anatomic knowledge to findings on basic imaging studies (e.g., MRI), and understands their indications in evaluation of benign soft tissue tumors • Understands histologic appearance on light microscopy • Demonstrates knowledge of different methods of biopsy and when indicated 	<ul style="list-style-type: none"> • Understands the natural history of benign soft tissue tumors • Demonstrates ability to generate a differential diagnosis based on imaging appearance • Demonstrates ability to generate a differential diagnosis based on histologic appearance • Differentiates dysplastic/traumatic/inflammatory lesions from neoplasms (e.g., myositis ossificans, fat necrosis, rheumatoid nodules) • Understands the surgical indications for benign soft tissue tumors • Demonstrates knowledge of appropriate surveillance of benign soft tissue tumors (e.g., atypical lipoma, intramuscular myxoma) 	<ul style="list-style-type: none"> • Understands appropriate alternative and non-operative treatments for benign soft tissue tumors (e.g., embolization/sclerotherapy for vascular lesions) • Understands medical genetics and associated syndromes with benign soft tissue tumors (e.g., neurofibromatosis, extraabdominal desmoid) • Demonstrates use of various imaging modalities to determine extent of disease and pre-operative planning • Understands the tumor-specific immunohistochemical stains • Understands the risk of malignant transformation of benign soft tissue tumors (e.g., neurofibromatosis) 	<ul style="list-style-type: none"> • Understands the natural history of aggressive benign soft tissue tumors (e.g., PVNS, aggressive fibromatosis) • Lists the tumor-specific molecular markers in benign soft tissue tumors • Understands the multidisciplinary options for treatment of aggressive benign soft tissue tumors (e.g., radiation, chemotherapy for desmoid, surgery) • Demonstrates knowledge of the treatment complications of benign soft tissue tumors • Understands the outcomes of treatment for benign soft tissue tumors • Understands the incidence of local recurrence and indications for treatment 	<ul style="list-style-type: none"> • Develops independent research project related to benign soft tissue tumors (e.g., pathogenesis of benign soft tissue tumors, treatment efficacy, complications)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Systems thinking, including cost-effective practice — Systems-based Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Describes basic levels of systems of care (e.g., self-management to societal) • Understands the economic challenges of patient care in the health care system 	<ul style="list-style-type: none"> • Gives examples of cost and value implications of care he or she provides (e.g., gives examples of alternate sites of care resulting in different costs for individual patients) 	<ul style="list-style-type: none"> • Orders and schedules tests in appropriate systems for individual patients balancing expenses and quality • Successfully navigates the economic differences of the health care system 	<ul style="list-style-type: none"> • Effectively manages clinic team and schedules for patient and workflow efficiency • Uses evidence-based guidelines for cost-effective care 	<ul style="list-style-type: none"> • Leads systems change at micro and macro levels (e.g., manages operating room [OR] team and patient flow in a multi-case OR day)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Fellow will work in interprofessional teams to enhance patient safety and quality care — Systems-based Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Recognizes importance of complete and timely documentation in teamwork and patient safety 	<ul style="list-style-type: none"> • Uses checklists and briefings to prevent adverse events in health care 	<ul style="list-style-type: none"> • Participates in quality improvement, or patient safety program and/or project 	<ul style="list-style-type: none"> • Maintains team situational awareness, and promotes “speaking up” with concerns • Incorporates clinical quality improvement and patient safety into clinical practice 	<ul style="list-style-type: none"> • Develops and publishes quality improvement project results • Leads local or regional quality improvement project
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Uses technology to accomplish safe health care delivery — Systems-based Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Explains the role of the Electronic Health Record (EHR) and Computerized Physician Order Entry (CPOE) in prevention of medical errors 	<ul style="list-style-type: none"> Appropriately and accurately enters patient data in EHR Effectively uses electronic medical records in patient care 	<ul style="list-style-type: none"> Reconciles conflicting data in the medical record 	<ul style="list-style-type: none"> Contributes to reduction of risks of automation and computerized systems by reporting system problems Understands and accurately codes diagnoses and procedures with appropriate international classification of disease (ICD) and current procedural terminology (CPT) codes 	<ul style="list-style-type: none"> Recommends systems re-design for faculty computerized processes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Self-Directed Learning — Practice-based Learning and Improvement				
<ol style="list-style-type: none"> 1. Identify strengths, deficiencies, and limits in one's knowledge and expertise. 2. Assess patient outcomes and complications in your own practice. 3. Set learning and improvement goals. 4. Identify and perform appropriate learning activities. 5. Use information technology to optimize learning and improve patient outcomes. 				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Acknowledges gaps in personal knowledge and expertise, and frequently asks for feedback from teachers and colleagues • Demonstrates computer literacy and basic computer skills in clinical practice 	<ul style="list-style-type: none"> • Continually assesses performance by evaluating feedback and assessments • Develops a learning plan based on feedback with some external assistance • Demonstrates use of published review articles or guidelines to review common topics in practice • Uses patient care experiences to direct learning 	<ul style="list-style-type: none"> • Accurately assesses areas of competence and deficiencies, and modifies learning plan • Demonstrates the ability to select an appropriate evidence-based information tool to answer specific questions while providing care 	<ul style="list-style-type: none"> • Performs self-directed learning without external guidance • Critically evaluates and uses patient outcomes to improve patient care • Incorporates practice change based upon new evidence 	<ul style="list-style-type: none"> • Teaches and assesses evidence-based medicine • Develops innovative treatment methods based on peer-reviewed literature
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Locate, appraise, and assimilate evidence from scientific studies to improve patient care — Practice-based Learning and Improvement				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Describes basic concepts in clinical epidemiology, biostatistics, and clinical reasoning • Categorizes the design of a research study • Formulates a searchable question from a clinical question • Critically reviews the topic-specific literature • Participates in or directs a tumor-related journal club • Participates in local/regional research meetings related to oncology 	<ul style="list-style-type: none"> • Ranks study designs by their level of evidence • Identifies bias affecting study validity • Utilizes tumor registries for research (e.g., institutional; surveillance, epidemiology, and end results [SEER]) 	<ul style="list-style-type: none"> • Applies a set of critical appraisal criteria to different types of research, including synopses of original research findings, systematic reviews and meta-analyses, and clinical practice guidelines • Critically evaluates information from others: colleagues, experts, industry representatives, and patient-delivered information • Performs data collection and analysis for a specific research project • Participates in formal resident teaching (i.e., pathology course, didactic lectures) 	<ul style="list-style-type: none"> • Demonstrates a clinical practice that incorporates principles and basic practices of evidence-based practice and information mastery • Cites evidence supporting several common practices • Develops tumor-related manuscript ready for submission by end of fellowship • Presents work at local/regional/national conference 	<ul style="list-style-type: none"> • Independently teaches and assesses evidence-based medicine and information mastery techniques • Engages in formal clinical research training curriculum
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Compassion, integrity, and respect for others as well as sensitivity and responsiveness to diverse patient populations, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation. Knowledge about respect for and adherence to the ethical principles relevant to the practice of medicine, remembering in particular that responsiveness to patients that supersedes self-interest is an essential aspect of medical practice — Professionalism				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Consistently demonstrates behavior that conveys caring, honesty, and genuine interest in patients and families Recognizes the diversity of patient populations with respect to gender, age, culture, race, religion, disabilities, sexual orientation, and socioeconomic status Recognizes the importance and priority of patient care, with an emphasis on the care that the patient wants and needs; demonstrates a commitment to this value 	<ul style="list-style-type: none"> Demonstrates an understanding of the importance of compassion, integrity, respect, sensitivity, and responsiveness while exhibiting these attitudes consistently in common and uncomplicated situations Consistently recognizes ethical issues in practice; discusses, analyzes, and manages these in common and frequent clinical situations, including socioeconomic variances in patient care 	<ul style="list-style-type: none"> Exhibits these attitudes consistently in complex and complicated situations Recognizes how one's own personal beliefs and values impact medical care Knowledgeable about the beliefs, values, and practices of diverse patient populations and the potential impact on patient care Recognizes ethical violations or medical errors in professional and patient aspects of medical practice, and communicates appropriately to residents and referring physicians 	<ul style="list-style-type: none"> Develops and uses an integrated and coherent approach to understanding and effectively working with others to provide good medical care that integrates personal standards with standards of medicine Consistently considers and manages ethical issues in practice Consistently practices medicine as related to specialty care in a manner that upholds values and beliefs of self and medicine 	<ul style="list-style-type: none"> Demonstrates leadership and mentoring regarding these principles of bioethics Manages ethical misconduct in patient management and practice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Accountability to patients, society, and the profession; personal responsibility to maintain emotional, physical, and mental health — Professionalism				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Understands when assistance is needed and is willing to ask for help • Exhibits basic professional responsibilities, such as timely reporting for duty, being rested and ready to work, displaying appropriate attire and grooming, and delivering patient care as a functional physician • Aware of the basic principles and aspects of the general maintenance of emotional, physical, and mental health, and issues related to fatigue/sleep deprivation 	<ul style="list-style-type: none"> • Recognizes limits of one's own knowledge in common clinical situations and asks for assistance • Recognizes value of humility and respect towards patients and associate staff members • Demonstrates adequate management of personal, emotional, physical, and mental health, and fatigue 	<ul style="list-style-type: none"> • Consistently recognizes limits of one's own knowledge in uncommon and complicated clinical situations; develops and implements plans for the best possible patient care • Assesses application of principles of physician wellness, alertness, delegation, teamwork, and optimization of personal performance to the practice of medicine • Seeks out assistance when necessary to promote and maintain personal, emotional, physical, and mental health 	<ul style="list-style-type: none"> • Mentors and models personal and professional responsibility to colleagues • Recognizes signs of physician impairment and demonstrates appropriate steps to address impairment in colleagues 	<ul style="list-style-type: none"> • Develops organizational policies and education to support the application of these principles in the practice of medicine
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Communication — Interpersonal and Communication Skills				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Communicates with patients about routine care (e.g., actively seeks and understands the patient's/family's perspective; able to focus and ask relevant questions about the patient's chief complaint) 	<ul style="list-style-type: none"> Communicates competently within systems and with other care providers, and provides detailed information about patient care Demonstrates sensitivity to patients and families and is aware of the social cultural context Engages in shared decision making based on the patient's understanding, and incorporating patient and family/cultural values and preferences Demonstrates empathic response to the patient's and family's needs Actively seeks information from multiple sources, including consultations Obtains informed consent, including risks, benefits, alternatives, and expectations 	<ul style="list-style-type: none"> Communicates competently in difficult patient circumstances (e.g., end-of-life or loss-of-limb discussions, limb salvage options) 	<ul style="list-style-type: none"> Communicates competently in complex/adversarial situations (e.g., parental discussions of diagnosis and treatment of cancer in children, treatment and prognosis of metastatic disease) Manages conflict with peers, subordinates, and superiors 	<ul style="list-style-type: none"> Demonstrates leadership in communication activities (e.g., coaches others to improve communication skills) Engages in self-reflection on how to improve communication skills
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				

Teamwork— Interpersonal and Communication Skills				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Recognizes and communicates critical patient information in a timely and accurate manner to other members of the treatment team (e.g., physician, nursing, and allied health care providers, administrative and research staff) Recognizes and communicates role as a team member to patients and staff members Responds to requests for information <p><i>Examples:</i> Reviews laboratory results, completes accurate and timely progress notes, answers pages in a timely manner</p>	<ul style="list-style-type: none"> Supports and respects decisions made by team Actively participates in team-based care; supports activities of other team members, communicates their role to the patient and family <p><i>Examples:</i> Leads daily rounds, hand-offs, transitions of care; communicates with other health care providers and staff members</p>	<ul style="list-style-type: none"> Able to facilitate, direct, and delegate team-based patient care activities Understands the OR team leadership role and obligations <p><i>Examples:</i> Communicates plan of action with OR personnel</p>	<ul style="list-style-type: none"> Leads team-based care activities and communications (e.g., plays an active role in multidisciplinary tumor conference, and manages patient care as a result of discussion) Able to identify and rectify problems with team communication <p><i>Example:</i> Organizes and verifies hand-off rounds, coverage issues</p>	<ul style="list-style-type: none"> Seeks leadership opportunities within professional organizations Able to lead/facilitate meetings within organization/system
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:				