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Report of the General Orthopaedic Competency Task Force on the Core Competencies for Orthopaedic Surgeons

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Executive Summary

Need: With increasing subspecialization leading to greater numbers of orthopaedic surgeons focusing on the care of a limited spectrum of orthopaedic conditions, it is important to define the core competencies for an orthopaedic surgeon so as to ensure the delivery of safe, timely, and competent orthopaedic care to the patient. This will help hospital credentialing committees, referring physicians, training programs, and practicing orthopaedists to better understand the capabilities, behaviors, and responsibilities expected of an orthopaedic surgeon. It will also provide the American Board of Surgery (ABOS) with an outline of real-world core orthopaedic surgical practice expected of a board-certified orthopaedic surgeon.

Process and Methodology: Assuming that the fundamental competencies for orthopaedic surgery would be those performed in a general orthopaedic practice, the data provided from a review of the ABOS case logs of applicants in general orthopaedic practice for the Part II oral examination and the recertification process provided the basis for developing the core competencies. Using the Delphi methodology, a 13-member General Orthopaedic Competency Task Force (GOCTF) consisting of individuals with expertise in orthopaedic surgery, orthopaedic surgical training, emergency medicine, family practice, hospital administration, and competency development was formed to delineate these competencies. A 270-question survey of orthopaedic knowledge and potential core orthopaedic surgical procedures followed by a second 41-item questionnaire was answered by the general orthopaedic examiners, question writers, and GOCTF members. The framework for the competencies was adult reconstruction (arthritis management, deformity management and orthopaedic oncology), acute orthopaedic care including fracture care, sports medicine and sports surgery, pediatrics, spine, foot and ankle, hand, office-based practice, and general professional competencies including communication and system-based practice.

Competencies: Each management competency includes the cognitive and assessment competencies necessary to investigate and synthesize a treatment plan for a condition as well as the motor skills to perform the respective surgical procedures. Nonoperative and operative management of core orthopaedic conditions was stratified into two levels. The management competencies are:

Management 1 (M1): The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up. These competencies are the fundamental skills expected of all orthopaedic surgeons.

Management 2 (M2): The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an

appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

These two management competencies are considered the core that must be maintained by the orthopaedic surgeon in orthopaedic practice as well as those taking call for emergency referrals and practice coverage. These competencies are the ones that the orthopaedic surgeon will be held accountable for by others and may become the basis for certification and maintenance of certification (competence). Competencies of practice-based learning and improvement, interpersonal communication skills, system-based practice, and professionalism define the appropriate behavior of all orthopaedic surgeons who provide care to patients within any type of health care system. The specifics of all these competencies are presented in detail in this report and its appendices.

Background

Little is written on the core competencies and responsibilities of a practicing surgeon, let alone an orthopaedic surgeon. The American Board of Medical Specialties (ABMS) and the Accreditation Council for Graduate Medical Education (ACGME) have defined six core competencies expected of all physicians as the framework for educating residents to ensure that at the end of their formal learning period they have achieved a minimum level of competency (Appendix 1). When the ACGME instituted continuous accreditation in 2013 (Next Accreditation System – NAS), outcome-based Milestones were introduced to determine trainee performance within the six core competencies. Milestones are detailed performance levels of strategically selected knowledge and skills (1). Milestones are a sampling or biopsy of an educational program outcome, useful for program evaluation and accreditation; however, they are not intended to be all-inclusive. The Royal College of Physicians and Surgeons of Canada (RCPS) has defined the competencies for all physicians in their CanMeds Program (2). This is similar to the ACGME Competencies, but is aimed at the practicing physician. Wadey has surveyed the practicing orthopaedic surgeons in Canada to determine what are considered reasonable competencies when a resident completes training (3) (Appendix 2). While these two sources refer to a Canadian medical practice, they are the sum of the few sources that attempt to define the core competencies of a practicing physician.

Another source to identify expected competencies might be a hospital's delineation of privileges for orthopaedic surgeons. These privileges are often vague and nonspecific. The orthopaedic surgeon's responsibility to the community and the patient was emphasized several years ago with the crisis in orthopaedic emergency coverage (4, 5). Reports on this issue identified a need to define the core competencies expected of all orthopaedic surgeons who take emergency call as well as the surgeon's professional responsibility to patients and society (4, 5) (Appendix 3).

Finally, what a general orthopaedic surgeon does on a daily basis may be considered to represent the competencies used in practice. The ABOS database for the year 2012 was queried for the top 15 procedures performed by candidates sitting for their initial certification examination and those sitting for the general orthopaedic surgery recertification (MOC) examination (Appendix 4). An interesting finding in this study was the lower numbers of spine procedures performed by the recent certification group as compared to the MOC group who would have had a minimum of seven to ten years in practice. This limitation of scope may be the result of the sophistication of care for complex problems that has advanced in all areas of orthopaedic surgery requiring medical knowledge and patient care skills beyond a reasonable expectation for any single individual.

Therefore, a comprehensive definition of the fundamental knowledge and skills expected of a practicing graduate orthopaedic surgeon has not been delineated.

Rationale

With the changing of orthopaedic practice due to subspecialization, health care delivery, and no delineation of core knowledge and competencies, there is a need to define the fundamental competencies of an orthopaedic surgeon to ensure that the orthopaedic patient will continue to receive high-quality safe care. More specifically, developing a set of fundamental competencies will be able to provide:

1. Orthopaedic residency programs with the core competencies expected for a graduate to enter orthopaedic practice
2. The ABOS and candidates with the core competencies required for certification and maintenance of certification for an orthopaedic surgeon
3. Health care facilities, professional associations, physicians, patients, and others with the core knowledge and skills expected of an orthopaedic surgeon
4. All orthopaedic surgeons with the core competencies and responsibilities that are expected by society to provide safe, quality care to their patients
5. Hospitals' medical credentialing boards with the delineation of an orthopaedic surgeon's core competencies for granting privileges
6. Referring physicians with a better understanding of the capabilities of an orthopaedic surgeon and consequently provide more effective patient referral

Method

Initially two senior orthopaedic surgeons interested in the process of defining core competencies for orthopaedic surgery established the basic terminology, which this process would use.

Definitions (6, 7):

Competency: The capability to do something successfully; an individual's ability to perform to the required workplace standard.

Competent: Properly or sufficiently qualified and capable to do something successfully.

Core Competencies: Includes the capabilities and behaviors expected of an orthopaedic surgeon in all six of the ACGME core competencies that are the framework for

training requirements: Medical Knowledge, Patient Care, Professionalism, Interpersonal and Communication Skills, Practice-Based Learning and Improvement, and Systems-Based Practice. The ACGME competencies of Medical Knowledge and Patient Care may be broader and less sophisticated for a general orthopaedic surgeon than for a subspecialist. These fundamental competencies are expected of all orthopaedic surgeons who accept patients for assessment and treatment of acute and non-acute musculoskeletal disorders.

In conclusion, the ***core competencies*** are the knowledge, skills, and abilities expected of a graduating orthopaedic surgical resident to enter a general orthopaedic practice and need to be maintained to practice orthopaedic surgery over a 30+ year career.

The core competencies are not meant to limit a surgeon from achieving a higher level of expertise for specific conditions and disorders, but only to confirm the core competencies of all who practice orthopaedic surgery. The breadth and depth of treatment delivered by an orthopaedic surgeon may vary based on the availability of community resources, including the accessibility of subspecialty care, the urgency of a condition, the surgeon's training, experience, and professional judgment. However, the required core competencies do not change. Prudent decisions to deliver care must take into account the available health care delivery system (Appendix 5) and the individual surgeon's capabilities.

Proficiency: A higher level of sophistication in knowledge, skills, and abilities than the fundamental competencies and is obtained from advanced, nuanced knowledge and procedural skills usually attained following fellowship training or CME.

Expert (or master): One with at least 10,000 hours of deliberate practice under the guidance of a master's supervision, not typically the manner in which a surgeon learns or practices (8). Thus, expertise is reserved for the practicing surgeon who has achieved extensive knowledge or skill beyond that expected for the average practicing surgeon.

Orthopaedic surgeon: A surgeon who has passed the ABOS orthopaedic surgery certifying examinations and who provides either acute or non-acute orthopaedic care to patients. An orthopaedic surgeon generally accepts patients from primary provider sources: physicians, allied health professionals, the public, and self-referrals. Referrals to a general orthopaedic surgeon do not ordinarily come from other orthopaedic surgeons. An orthopaedic surgeon needs general knowledge and skills in all anatomic areas and orthopaedic subspecialties. General knowledge and skills are foundational, without precluding the orthopaedic surgeon from attaining a higher level of capability in focused areas of subspecialty practice. An orthopaedic surgeon is not expected to provide care in all areas and subspecialties when practicing in a location where specific required resources or subspecialists are available. In settings that have limited resources, higher levels of care would only be a consideration based on the risk to the patient from delayed or non-treatment.

Exceptional Practice Circumstance: Practice resources and logistical constraints can determine the ability or inability to provide or obtain specific care for patients. When resources or associated medical staff such as anesthesia, general surgery, vascular surgery, interventional cardiology, physical medicine and rehabilitation, medical oncology, rheumatology, internal medicine, pediatrics, and obstetrics are limited, delivering care in some fundamental competencies may not be prudent. Conversely, the orthopaedic surgeon may perform procedures beyond the defined core competencies in certain situations, e.g., an orthopaedic surgeon in rural practice who does not have a readily available referral system. Situations where a higher level of care should be considered are classified into two broad categories:

Urgency of care: An orthopaedic surgeon may need to perform a procedure beyond the fundamental competencies when the acuity of the condition makes the time needed for transfer to a higher level of care inappropriate because such a delay would compromise the patient's care.

Training: An orthopaedic surgeon may acquire knowledge and skills either by formal CME training or maintenance of competency programs, or by ongoing practice improvement in an area of interest.

Timeliness: This is based on when the orthopaedic surgeon is first made aware of their obligation to a specific patient, e.g., when taking emergency call, timeliness is in response to a request for on-site consultation by the emergency physician. For delivery of orthopaedic care for conditions that require timely assessment and/or intervention, the decision regarding timeliness of on-site responses is based on the patient's presentation as communicated by the requesting physician's evaluation, perspective, and level of concern. The urgency to assess/triage/manage patients is based on the need to preserve life and limb function. (See Appendix 7 for a detailed review and examples.)

Process

Using the ABMS and the ACGME's Core Competencies for graduate medical education as a basis, the core orthopaedic practice competencies were defined so they can be easily applied to residency, certification assessments, and practice. To determine the core orthopaedic knowledge and procedures, the Delphi process was used. This process allows for a consensus opinion of a large group of knowledgeable individuals in a specific area. The first Delphi survey was a 270-question version of Wadey's Canadian survey of competencies expected at the time of graduation from orthopaedic training (3) modified to better represent American orthopaedic practice. It was distributed to the ABOS general orthopaedic written examination question

writers, the voluntary General Orthopaedic Competency Task Force, and the ABOS general orthopaedic oral examiners using the SurveyMonkey tool (Appendix 15). These groups of individuals were chosen as it was felt that they had a broad understanding of the knowledge and competencies practiced by orthopaedic surgeons doing a general orthopaedic practice. An expert in competence assessment analyzed the results of the survey. The respondents ranked the knowledge items and competencies from 0 to 5. Any item with an average ranking of 3.5 or higher was under consideration as a core competency. As well, the survey asked if the item was mandatory for a general orthopaedic practice. If the item had a ranking of 3.5 and at least 50% of the respondents stated it was mandatory for a general orthopaedic practice, the knowledge item or competence was deemed to be fundamental for orthopaedic practice. If an item ranked 3.5 but had less than 50% of the respondents stating it was mandatory, it was referred to the GOCTF for discussion.

To delineate the core orthopaedic competencies, a task force including a broad range of stakeholders was created. The GOCTF consists of two senior members of the ABOS, as well as representatives from family medicine, emergency medicine, general orthopaedics, orthopaedic training programs, competence assessment experts, hospital administration, and insurance experts. Unfortunately, large health care payers declined to participate, as did the hospital associations.

Core Orthopaedic Competencies Task Force

Name	Location	Interest
Douglas Archibald, PhD	Ontario, Canada	Competence development
James W. Barber, MD	Georgia, USA	General orthopaedic surgery
Eugene P. Christian, MD	North Carolina, USA	Hospital administration
Richard J. D'Ascoli, MD	New York, USA	General orthopaedic surgery, health insurance
Richard J. Haynes, MD	Arizona, USA	Pediatric orthopaedics
Suzanne S. Hecht, MD	Minnesota, USA	Family and sports medicine
Shepard R. Hurwitz, MD	North Carolina, USA	Foot and ankle
James F. Kellam, MD	Texas, USA	Orthopaedic trauma and hand
Alexander C. McLaren, MD	Arizona, USA	Orthopaedic education, orthopaedic infection
Terrance D. Peabody, MD	Illinois, USA	Musculoskeletal oncology, resident education
Stephen R. Southworth, MD, MS, MBA	Mississippi, USA	General orthopaedic surgery
Robert W. Strauss, MD	Ohio, USA	Emergency medicine
Veronica M.R. Wadey, BPHE, BEd, MD, MA	Ontario, Canada	Orthopaedic reconstruction and arthroplasty

The GOCTF divided orthopaedic practice into the following areas:

- Adult reconstruction – arthritis management, non-emergency musculoskeletal conditions, deformity management, and orthopaedic oncology
- Acute care orthopaedics, which includes emergency and fracture care
- Sports medicine and sports surgery
- Pediatrics
- Spine
- Foot and ankle
- Hand
- Office-based practice
- Professional competencies
- Communication
- System-based practice and scholarship

Working groups were established to propose competencies for these areas. Each working group presented a written consensus statement defining the competencies for their area. The GOCTF met and agreed on the specific competencies after reviewing each presentation, which included a discussion of verbal and written information. These results were compared to the Delphi survey. Any proposed competencies which were felt to be controversial were submitted to a further survey of the surgical members of the GOCTF done through SurveyMonkey and results reviewed during a conference call. The final accepted controversial core competencies were submitted by a second Delphi survey to the larger group. This survey consisted of 41 items. Because these competencies were controversial, it was determined by the GOCTF that a 60% agreement by the survey group was required to include the item as a core competency. These results were reviewed and confirmed as core knowledge and competencies by the GOCTF at a second meeting. All the knowledge items and core competencies were then reviewed and refined at this meeting (see Timeline).

General Orthopaedic Competency Task Force Proposals

Competencies: The Core Competencies of Orthopaedic Surgery are based on the six core competencies used by the Accreditation Council for Graduate Medical Education (ACGME). Medical Knowledge and Patient Care were combined as this more closely represented clinical practice. Each orthopaedic competency includes both the knowledge and evaluation ability associated with the respective management competency. The competencies were divided into two management categories. Within each management competency the orthopaedic surgeon is expected to assess, investigate, and synthesize a treatment plan for an orthopaedic condition as well as have the skill to perform the core surgical procedures. The management competencies are:

Management 1 (M1): The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up.

Management 2 (M2): The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

These two management competencies are considered the core knowledge and skills that must be maintained by the orthopaedic surgeon for orthopaedic practice as well as those taking orthopaedic call for emergency referrals and practice coverage. These competencies are the ones that the orthopaedic surgeon will be held accountable for by others and may become requirements in the certification and maintenance of certification (competence) programs.

Behavioral competencies of practice-based learning and improvement, interpersonal communication skills, system-based practice, and professionalism define the appropriate behavior of any orthopaedic surgeon who is in the practice within any type of health care system. All the core competencies for orthopaedic surgery as determined by the GOCTF are presented in detail in this report.

General Orthopaedic Competency Task Force Delphi Process Timeline

Date	Action
September 2013	Invitations sent and background information exchanged
November 22, 2013	Conference call to determine framework for developing a list of competencies; appointing work groups to define subsets to the identified competencies
January 2014	First Delphi survey
May 20, 2014	GOCTF meeting in Chapel Hill, NC, for first compilation of core competencies
July 12, 2014	Teleconference to finalize controversial core competencies
August 2014	First Report drafted
September 2014	First Report presented to the ABOS at the Annual Meeting in Chapel Hill, NC
January 2015	Second Delphi survey
September 21, 2015	GOCTF meeting, in Chapel Hill to finalize core competencies
June 2016	Final report written and submission to JBJS

The Core Competencies

The following core competencies are the result of the Delphi process and the GOCTF deliberations. The survey results are presented in Appendix 15 for the readers interested in reviewing the data. The material and deliberations of the GOCTF are recorded in the appendices.

Basic Knowledge and Assessment

The basic knowledge competencies that any orthopaedic surgeon is expected to have and/or perform, regardless of specialty or area of practice, are the following:

a. Understand bone and soft-tissue biology and pathophysiology including growth, development and aging, injury, disease, and repair of musculoskeletal tissues including rehabilitation and assessment of return to vocational and recreational activities
b. Understand short and long-term impact on a patient's impairment on function, i.e., limitation of capabilities and activities
c. Understand the relative effectiveness of various operative and nonoperative options
d. Understand the comorbidities of a patient that will impact on the orthopaedic surgeon's care plan
e. Understand conditions that are expected to be cared for by other specialists or subspecialty orthopaedists, e.g., metabolic bone disease in the adult including osteopenia and osteoporosis, crystalline arthropathy: gout and pseudogout, tumors of musculoskeletal system, diabetic foot ulcers, exercise-induced leg compartment syndrome (Appendix 8), and stress fractures (Appendix 8)
f. Perform an assessment and management of postoperative complications for patients, even if referred (Appendix 6)
g. Perform an assessment of musculoskeletal conditions using a history, physical examination, and an investigative plan in order to develop a differential diagnosis based on an understanding of the pathophysiology of musculoskeletal conditions (Appendix 6 and Appendix 13)

Management Competencies

Adult Reconstruction

This section includes the management core competencies for adult reconstruction (Appendix 6) excluding arthroscopy, for which the competencies are in the Sports Medicine and Sports Surgery section (Appendix 8).

Management 1: The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up care for:

a. an arthrotomy of the hip, knee, shoulder, and ankle and foot
b. a synovectomy of the knee
c. an amputation through the femur (above knee), through the knee, or through the tibia (below knee)
d. a traumatic amputation of the upper extremity
e. a fasciotomy of the lower extremity and upper extremity such as for an acute compartment syndrome
f. a primary hemiarthroplasty for fracture of the femoral neck
g. a bone graft harvest from the iliac crest
h. both closed and open treatment for fracture of the distal radius, proximal ulna, distal femur, proximal and distal tibia, and proximal femur (intertrochanteric fractures and femoral neck fractures)
i. assessment of deformity
j. open rotator cuff repair
k. superficial or deep bone or soft-tissue biopsy, such as for:
    i. bone infection
    ii. joint infection
    iii. soft-tissue infection
    iv. management of a benign lesion, e.g., Baker's cyst

Management 2: The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

The following are examples:

a. failed arthroplasty, e.g., dislocated, loose, or infected implant
b. acute septic total joint arthroplasty after the drainage of the joint
c. periprosthetic fractures of the hip and knee
d. a primary uncomplicated total hip (case load must meet required level for competence)
e. a primary uncomplicated total knee (case load must meet required level for competence)

f. revision of total joint arthroplasty with or without bone loss requiring custom prosthesis or bone graft (training and case load must meet required level for competence)
g. a primary unicompartmental knee (case load must meet required level for competence)
h. hemiarthroplasty for a proximal humeral fracture

Acute Orthopaedic Care Including Fracture Care

This section includes the emergent and urgent conditions that are seen by an orthopaedic surgeon either in the office, by hospital in-patient consultation, or in the emergency department. These competencies are required for any orthopaedic surgeon who takes orthopaedic call for a hospital or group (Appendix 7).

Acute Care Behavioral Competencies

The orthopaedic surgeon must be able to:

a. assess emergent and urgent patient situations remotely, e.g., by phone; the orthopaedic surgeon must be competent to determine the two levels of consultation; (1) providing advice without directly evaluating the patient, and (2) direct face-to-face patient evaluation
b. utilize contemporary telecommunication devices that allows remote visual assessment of the patient and/or radiographs
c. understand local protocols for the management of patients with emergent and acute conditions to most efficiently and cost-effectively deliver acute orthopaedic care
d. assess a patient with a face-to-face evaluation if requested by a member of the acute health care team
e. assess and ensure that the most appropriate orthopaedic provider manages the patient when a higher level of care is needed, i.e., triage, initiate care, treat directly, and/or transfer to higher level of care for definitive management (Appendix 7)
f. communicate effectively with a physician or surgeon, the patient, and his/her family and in particular with referring and accepting providers to ensure safe patient transfer
g. generate in a timely fashion accurate and complete written reports as requested by the patient, legal counsel, or any others entitled by law to such a report

Management 1: The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up for (Appendix 7):

a. acute compartment syndromes that require fasciotomy of the lower extremity and upper extremity

b. conditions that require application of casts/splints to both the upper and lower extremities for traumatic and non-traumatic conditions
c. nonoperative and operative care of uncomplicated adult fractures and dislocations within the limitations of their practice environment, e.g., fractures of the proximal femur (intertrochanteric fractures and femoral neck fractures), distal femoral fractures, closed reduction of adult fractures, and adult dislocations of the upper extremity and lower extremity
d. potential head injury and/or concussion when treating athletes
e. acute infection, uncomplicated chronic infection

Management 2: The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

For example:

a. initiate care by performing a joint spanning external fixation to a lower extremity injury
b. initiate care by performing a joint spanning external fixation to an upper extremity injury
c. initiate acute management for an open fracture including splinting
d. debridement and provisional stabilization of open fractures of a Grade I, II, III A and B open fracture when transfer of an open fracture may be delayed
e. open reduction and internal fixation (ORIF) of periprosthetic fractures of the hip or knee
f. hemiarthroplasty for proximal humeral fracture
g. ensure expedient care for ischemia caused by reparable vascular injuries in association with fractures and dislocations

Sports Medicine and Sports Surgery

Management 1: The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up care when arthroscopic-assisted treatment is indicated for the shoulder and knee (Appendix 8). The following are the expected core competencies:

a. understand the surface anatomy, relationships of nerves and vessels to the knee and shoulder

b. arthroscopy insertion, diagnostic (field of view for all intra-articular areas) and therapeutic techniques (triangulation, use of operative arthroscopic instruments and suturing)
c. arthroscopic repair of a rotator cuff or SLAP lesion
d. arthroscopic meniscectomy
e. arthroscopic meniscal repair
f. arthroscopic anterior cruciate reconstruction

Management 2: The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise. The general orthopaedic surgeon may elect to develop a special competency in arthroscopic assisted treatment of the following joints:

a. ankle
b. elbow
c. wrist

Pediatrics

Management 1: The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up care for (Appendix 9):

a. closed management of all uncomplicated long bone fractures
b. non-accidental trauma if the appropriate social service system is not in place

Management 2: The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

a. problems about the hip including developmental dysplasia, Perthes disease, and slipped capital femoral epiphysis
b. spinal problems including scoliosis, kyphosis, and spondylolithesis
c. skeletal dysplasias and metabolic bone disease
d. foot pain and deformity (pes planus, pes cavus, clubfeet, coalitions)

e. hand pain and deformity
f. hip fractures and dislocations
g. open fractures of the long bones
h. displaced intra-articular growth plate injuries
i. fractures with a potential for significant acute complications such as vascular injury or compromise, for example, supracondylar humeral fractures or distal femoral epiphyseal injuries
j. musculoskeletal infections
k. non-accidental trauma

Spine

Management 1: The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up care for nonoperative low back pain including sciatica and chronic neck pain (Appendix 10).

Management 2: The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

a. acute spinal cord injury, nerve root compression, and infection, e.g., cauda equina syndrome, and if referral is unavailable due to distance or weather may perform
    i. lumbar decompression
    ii. cervical decompression
b. initially identify and manage nonoperatively osteoporosis and spinal tumors with appropriate referral for specialist care
c. perform acute non-skeletal spinal stabilization procedures and manage the spinal injured patient as defined by local protocols
d. investigate adult spinal conditions including deformity, disc herniation, neurogenic claudication
e. postoperative spinal problems

Foot and Ankle

Management 1: The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up care for (Appendix 11):

a. common acute injuries of the foot and ankle
b. common non-traumatic conditions of the foot and ankle
c. acute life and limb-threatening manifestations of the diabetic foot (abscesses) including amputation surgery

Management 2: The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

a. provide acute reduction and provisional stability, operatively if necessary, for markedly displaced and/or open or closed hindfoot and midfoot fracture/dislocations
b. debride and provisionally stabilize open fractures, including a "mangled foot"
c. apply a provisional spanning external fixator for foot and ankle fractures with severe soft-tissue injury
d. assess and stabilize a chronic diabetic foot problem
e. may manage deformity conditions which will require arthrodesis of the foot and ankle:
    i. metatarsophalangeal (MTP) fusion
    ii. ankle fusion
    iii. subtalar fusion
    iv. triple arthrodesis

f. assess and manage non-deformity conditions such as adult tarsal coalitions

Hand

Management 1: The orthopaedic surgeon must be competent to provide definitive care including assessment, investigation, initial or emergency care, operative or nonoperative care, and follow-up care for (Appendix 12):

a. uncomplicated soft-tissue repair of the hand, especially fingertip injuries
b. uncomplicated simple tendon procedures, e.g., laceration of an extensor tendon
c. common closed hand fractures

d. common primary uncomplicated neural compressive disorders
e. uncomplicated hand infections

Management 2: The orthopaedic surgeon must be competent to assess, investigate, and commence timely non-emergency or emergency care and then either transfer the patient to an appropriate subspecialist's care or provide definitive care based on urgency of care, exceptional practice circumstance, or one's individual higher training. In general, this would include some procedures that are also performed by fellowship-trained surgeons, but are entirely consistent with one's practice based on experience, practice environment, and/or specialty interest or expertise.

a. debridement and management for an open hand injury
b. management of non-traumatic hand or upper extremity problems
c. assess the acutely injured hand and provide initial treatment, e.g., splinting
d. reduce and splint complex fractures and fracture dislocations, e.g., a closed reduction
e. recognize the significance of an injection injury (grease, paint, etc.) of the hand and need for immediate transfer

Office-Based

The general orthopaedic surgeon must be competent to (Appendix 13):

a. perform ambulatory fracture care management using casting and braces and recognize the fractures appropriate to this care
b. perform a history and physical examination, interpret imaging and labs for general orthopaedic conditions of the spine and extremities
c. perform an evaluation and treatment of overuse injuries and their prevention
d. perform an evaluation and treatment of soft-tissue injuries (sprains, strains)
e. have a general knowledge of musculoskeletal rehabilitation and therapy
f. have a general understanding of impairment evaluations and be competent in the use of AMA Guidelines for Impairment Evaluation or other established standards

Professional

The **minimum professional** expectation for an orthopaedic surgeon includes the acceptance of all patients for assessment and treatment from all sources, i.e., physicians, health professionals, the public, and self-referrals. The acceptance of patients should not be constrained by an orthopaedic surgeon's declared subspecialty or by the patient's ability to pay. The patient evaluation should not be limited or delayed unreasonably based on the need for referral to a higher level of care. Further, the patient evaluation should not be limited or delayed because the patient presents with conditions and disorders that go beyond the scope of the orthopaedic surgeon's current competency.

The orthopaedic surgeon must be competent to:

1. maintain appropriate relationships and avoid conflicts with industry and commercial entities
2. engage and appropriately organize the health care delivery team
3. evaluate and prudently incorporate new technology into practice
4. disclose errors using institutionally supported mechanisms
5. work with other health care providers to develop meaningful regulatory measures
6. follow the AAOS Code of Ethics and Professionalism for Orthopaedic Surgeons
7. provide professional expert testimony when purporting to be an expert

Communication

The orthopaedic surgeon must be competent to:

1. provide peer-to-peer consultation and communication
2. foster professional rapport with health care teams
3. communicate in understandable terminology to educate patients
4. communicate in understandable terminology to obtain an informed consent
5. listen effectively to patients and their families and members of the health care team
6. establish a rapport and demonstrate empathy to patients and their families
7. communicate a treatment plan to the patient so that he or she understands the relative effectiveness of various operative and nonoperative options

Systems and Culture

The orthopaedic surgeon must be competent to:

1. appraise and apply evidence-based medicine to practice and to participate in ongoing lifelong learning and practice evaluation for self-improvement
2. work in a patient safety culture and be competent and willing to participate in hospital quality improvement or performance improvement processes
3. provide accurate and complete patient documentation as determined by local and national standards
4. advocate for patients' rights and quality care, and assist patients in navigating the health care system
5. adhere to public health reporting requirements
6. provide culturally and gender sensitive competent care

Summary

The material generated by this GOCTF on the Core Competencies for Orthopaedic Surgeons is the result of a collaborative effort by orthopaedic surgeons and non-surgeons to identify the core responsibilities of the practicing orthopaedic surgeon to the orthopaedic patient and health care system. This report will provide the practicing orthopaedic surgeons, orthopaedic training programs, and health care delivery systems, with what is expected to be the core competencies necessary to facilitate the practice of orthopaedic surgery. Most importantly, it will ensure safe, timely, and competent orthopaedic patient care. These core competencies will evolve, as does orthopaedic practice. Continued review of the demands on orthopaedic practice will be needed to refine the defined core competencies.

References

1. ABMS/ACGME core competencies for residency training. https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/260_orthopaedic_surgery_2016.pdf.

2. Can Meds competencies. http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e.

3. Wadey VM, Dev P, Buckley R, Walker D, Hedden D. Competencies for a Canadian orthopaedic surgery core curriculum. J Bone Joint Surg Br. 2009 Dec;91(12):1618-22.

4. American Orthopaedic Association, Orthopaedic Institute of Medicine. Report on the crisis in the delivery of orthopaedic emergency care: AOA white paper. 2009 Jan. http://www.wsoa.org/postings/executivesummary.pdf.

5. Bosse MJ, Henley MB, Bray T, Vrahas MS. An AOA critical issue. Access to emergent musculoskeletal care: resuscitating orthopaedic emergency-department coverage. J Bone Joint Surg Am. 2006 Jun;88(6):1385-94.

6. Pitts D, Rowley D, Marx C, Sher L, Banks T, Murray A. A competency based curriculum for specialist training in trauma and orthopaedics. 2006 Dec. http://www.gmc-uk.org/Trauma_Orthopaedics_Curriculum_01.pdf_30557302.pdf.

7. Nousianinen M. Competency-based education: a new model for teaching orthopaedics. University of Toronto core competence training meeting syllabus. 2013 Apr 12.

8. Ericsson KA, Krampe R Th, Tesch-Romer C. The role of deliberate practice in the acquisition of expert performance. Psychological Review. 1993;100(3):363-406.

9. Dressler DD, Pistoria MJ, Budnitz TL, McKean SC, Amin AN. Core competencies in hospital medicine: development and methodology. J Hosp Med. 2006:1 Suppl 1:48-56.

10. Ito C, Ota K, and Matsuda M. Educational content in nurse education in Japan: a Delphi study. Nurs Ethics. 2011 May;18(3):441-54.

11. von der Gracht HA. Consensus measurement in Delphi studies: review and implications for future quality assurance. Technological Forecasting and Social Change. 2012 Oct;79(8):1525-36.

12. European Board of Hand Surgery. White book of hand surgery in Europe. 2015 Jul 1. http://fessh.com/documents/White%20Book%20on%20Hand%20Surgery%20in%20Europe%20EBHS.pdf.

13. Van Heest A, Putnam M, Agel J, Shanedling J, McPherson S, Schmitz C. Assessment of technical skills of orthopaedic surgical residents performing open carpal tunnel release surgery. J Bone Joint Surg Am. 2009 Dec;91(12):2811-7.

14. ACGME program requirements for graduate medical education in hand surgery, http://www.acgme.org/portals/0/pfassets/programrequirements/263-363-443_hand_surgery_2016_1-yr.pdf.

http://dx.doi.org/10.2106/JBJS.16.00761

Core Orthopaedic Surgery Competencies

Appendices

Appendix 1

ACGME and IOM Competencies

ACGME Competencies

MEDICAL KNOWLEDGE

In addition to knowledge content, it is expected that all residents demonstrate their ability to acquire and access new knowledge, interpret the evidence they uncover, and then apply it in the clinical setting. The program must document that all residents are able to do this, and that the faculty have a structured way of teaching and evaluating this element of medical knowledge. There should be a specific evaluation tool that identifies the criteria and standards for achievement of competence.

Residents must demonstrate:

- Knowledge about established and evolving biomedical, clinical, and cognate (e.g., epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

Residents are expected to:

- Demonstrate an investigatory and analytic thinking approach to clinical situations
- Know and apply the basic and clinically supportive sciences which are appropriate to their discipline

PATIENT CARE

The history and physical examination serve as the basic foundation upon which all of clinical medicine is built. Programs must ensure that residents can perform a detailed and accurate history and physical examination appropriate for the context of the age and developmental level of the patient. In the initial stages of training, this should be demonstrated for patients with routine diagnoses. By the end of residency training, programs should document resident competence in history taking and physical examination for any patient.

To document the achievement of competence for this element of patient care, residents must be evaluated performing histories and physical examinations. This must be accomplished through direct faculty observation using a structured approach with different evaluators in different settings (e.g., documentation by the faculty in the adolescent clinic that a resident is

capable of performing a pelvic examination, etc.). This structured approach should involve a written template that is distributed to faculty.

To determine competence in making diagnostic and therapeutic decisions as well as developing and carrying out management plans, there must be evidence of direct faculty and resident interaction in the clinical setting. Residents must demonstrate progressive autonomy with increasing levels of experience, but the autonomy should be balanced with appropriate faculty supervision. The tool used to assess these skills must have questions that directly relate to the skill set involved, address the differences in expectations between junior and senior residents, and have behavioral descriptors for points on the rating scale.

There must be a structured process of evaluation that provides an opportunity for every resident to be assessed in using the skills necessary to counsel patients, deliver bad news, etc. Continuity clinic is an example of an optimal setting for developing and assessing longitudinal therapeutic relationships with patients and families. The assessment should address the specific skills needed to provide health maintenance and anticipatory guidance including but not limited to coordination guidance. There must be evidence that residents are evaluated in this setting on a recurrent basis.

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

Residents are expected to:

- Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
- Gather essential and accurate information about their patients
- Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
- Develop and carry out patient management plans
- Counsel and educate patients and their families
- Use information technology to support patient care decisions and patient education
- Perform competently all medical and invasive procedures considered essential for the area of practice
- Provide health care services aimed at preventing health problems or maintaining health
- Work with health care professionals, including those from other disciplines, to provide patient-focused care

PRACTICE-BASED LEARNING AND IMPROVEMENT

An ethos of ongoing reflecting for the purpose of improved quality of care for patients should permeate every aspect of training to reinforce the need for trainees to adopt this practice as a lifelong habit. Residents should be paired with faculty mentors with whom they can develop a meaningful relationship to guide them in the process of reflection on practice with the goal of practice improvement. Structured (and documented) semiannual meetings with mentors must occur to achieve this goal. Mentor responsibilities should be documented and faculty development provided to ensure that mentors have the needed skills to address the full scope of their responsibilities and function as a valuable resource to residents.

The process of self-assessment is most valuable when discussed with a mentor. Having the resident complete a structured self-assessment using attributes important to the practicing physician (e.g., time management, stress management, etc.) and/or a self-assessment focusing on elements of the competencies in preparation for a meeting with the mentor is helpful in opening the discussion. In addition, the mentor can then guide the resident in (1) reviewing evaluations and critical incidents to understand how one's performance/behavior impacts others, and (2) how to incorporate this feedback into future practice improvement. The learner then builds on this self-assessment and reflective process by developing an individualized learning plan (e.g., documenting a minimum of three personal learning objectives to address identified areas of needed improvement and strategies to achieve the objectives). This plan should be updated annually, with the final plan focusing on transition to the next phase of one's career and a plan for lifelong learning. The individualized learning plan must be completed and reviewed annually. The mentor and/or program director must review and update learning plans with the residents and document that this process has occurred.

The program must also document that each resident also acquires the skills needed to analyze and improve the quality of their practice. This may be accomplished by participation in a quality improvement (QI) project/activity and may be completed by individual residents or involve teams of residents. This requirement may also be met through resident membership on a QI committee. In this case there must be evidence of the resident's activity participation in the planning, implementation, and analysis of an intervention on a practice outcome. Projects/activities or committee work must be supervised and guided by faculty or allied health professionals with expertise in quality improvement.

Programs must provide skilled teachers as role models who demonstrate the value of teaching students, residents, patients, and families. Structured learning activities that address teaching skills should be incorporated into the curriculum. Residents should have opportunities to practice these skills and in turn be evaluated in so doing.

Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to:

- Analyze practice experience and perform practice-based improvement activities using a systematic methodology
- Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
- Obtain and use information about their own population of patients and the larger population from which their patients are drawn
- Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness
- Use information technology to manage information, access online medical information, and support their own education
- Facilitate the learning of students and other health care professionals

INTERPERSONAL AND COMMUNICATION SKILLS

Effective written and verbal communication, including telephone triage, is critical to practicing the science of medicine; style of communication is critical to practicing the art of medicine. Both components should be addressed as part of residency training. In the practice of orthopaedic surgery, the ability to communicate must not only extend to different cultural backgrounds and socioeconomic strata as in other disciplines, but also extend to different developmental levels. In order to be effective, the communication must target both the patient and the family. Perceptions by the patient and family of a resident's level of interest and concern will affect their judgment as to the quality of care provided and the willingness to comply with recommendations. Both a structured curriculum to address the needed skills and engaging residents in interactive methods of learning such as role playing, review of videotapes, small group discussion of vignettes, etc., are necessary to enable residents to become competent. The ability to function as part of a team is important in optimizing patient care since no one individual has all the needed expertise to attend to the medical, psychological, and social needs of patients. Teamwork during training also lays the groundwork for future collegial relationships in a primary care practice within a community or as a faculty member within a division and department. It is equally important to have team members (including the patient and family as part of the team) contribute to the assessment of a resident's communication skills, since the resident will relate to each individual in a unique way. The program should provide a mechanism to ensure that patients/families and representatives of the health care team evaluate the interpersonal and communication skills of residents and that this feedback is given to the residents, preferable as aggregate data that preserves the anonymity of the

evaluators. These evaluations should supplement the evaluations of faculty and peers who based their assessments on direct interactions in the clinical setting.

One effective way of evaluating communication is through medical record review. This should become a routine part of resident assessment with assigned settings, faculty, and types of communications clearly delineated. Structured templates or checklists of necessary items for effective communication in the various types of written documentation (e.g., progress notes, discharge summaries, etc.) are helpful in promoting consistency among evaluators. Timelines of completion as well as quality should be assessed and a mechanism for delivering feedback to the resident must be ensured.

Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients' families, and professional associates.

Residents are expected to:

- Create and sustain a therapeutic and ethically sound relationship with patients
- Use effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
- Work effectively with others as a member or leader of a health care team or other professional group

SYSTEMS-BASED PRACTICE

In order to best serve a patient population, one must develop a familiarity with the natural history and epidemiology of major health problems in the community. A background understanding of cultural norms and health beliefs is also of crucial importance. Surgeons should invest in the health literacy and awareness of the community served so that patients can access, process, and understand health information to the extent that it allows for shared decision-making about their health. This information becomes helpful in improving patient/family compliance as well. The program must provide a structured curriculum that addresses all of the elements of this competency and opportunities to apply this learning in the context of working in interdisciplinary teams. Programs must provide a safe environment that encourages practitioners to identify weaknesses, deficiencies, and errors. The program must ensure that each resident is actively engaged in activities, under the guidance of experienced faculty, to identify system problems/errors, and to develop and implement system solutions. Morbidity and mortality conference provides an ideal venue for a structured approach to the examination of system errors and the development of system solutions provided the interdisciplinary team that represents the system is involved.

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. Residents are expected to understand how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice.

The resident must:

- Know how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
- Practice cost-effective health care and resource allocation that does not compromise quality of care
- Advocate for quality patient care and assist patients in dealing with system complexities
- Know how to partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

PROFESSIONALISM

Medical ethics should be emphasized in the didactic curriculum and modeled by the faculty in clinical practice. This includes, but is not limited to, the ethical principles of medical practice and the ethical aspects of the relationship of the physician to their patients (e.g., initiating and discontinuing the treatment relationship, confidentiality, consent, issues of life sustaining treatments, when to begin and stop resuscitation, legal and ethical issues in the end-of-life decision-making, etc., as well as the relationship of the physician to the patients' families), and the relationship to other physicians and to society (e.g., the impaired physician, peer review, conflicts of interest, resource allocation, institutional ethics committees, and ethical issues in research). Reflection on the personal and professional impact of grief and loss should likewise be emphasized. A structured curriculum with meaningful venues for teaching that extend beyond the traditional lecture to include interactive learning (e.g., small group discussions of vignettes or case studies, computer-based modules, role plays, etc.) will meet this requirement.

The ability to demonstrate a knowledge, understanding, and acceptance of individual and cultural differences will promote greater trust on the part of the patient and a greater likelihood that the patient will reveal personal information that may be pertinent to his or her health conditions, management, and the ability to comply with prescribed therapies. There should be evidence of focused teaching of cultural competence within the departmental or institutional curricula. Multiple-source feedback that includes patients/families and allied health professionals is critical to the professional formation of trainees. There must be a

structured mechanism for dissemination and collection of evaluations as well as delivery of feedback to the residents. Timeliness of feedback is also important, particularly when there has been a breach of professionalism. The program needs a structured mechanism in place for documentation, such as the use of critical incidents or instant evaluations to provide immediate feedback to learners. In cases where remediation is needed, the steps should include feedback, the development of an action plan with the resident that specifically addresses the infraction, ongoing monitoring of behavior, and an identified consequence if improvement is not demonstrated.

Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

Residents are expected to:

- Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and ongoing professional development

The resident must also:

- Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
- Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Institute of Medicine (IOM) Competencies

Provide patient-centered care

- Identify, respect, and care about patients' differences, values, preferences, and expressed needs; listen to clearly inform
- Inform, communicate with, and educate patients; share decision-making and management
- Continuously advocate disease prevention, wellness, and promotion of healthy lifestyles, including a focus on population health
- Work in interdisciplinary teams
- Cooperate, collaborate, communicate, and integrate care in teams to ensure that care is continuous and reliable

Employ evidence-based practice

- Integrate best research with clinical expertise and patient values for optimum care, and participate in learning and research activities to the extent feasible

Apply quality improvement

- Identify errors and hazards in care; understand and implement basic safety design principles, such as standardization and simplification. Continually understand and measure quality of care in terms of structure, process, and outcomes in relation to patient and community needs; and design and test interventions to change processes and systems of care with the objective of improving quality

Utilize informatics

- Communicate, manage knowledge, mitigate error, and support decision-making using information technology

Appendix 2

Competencies for a Core Curriculum in Orthopaedic Surgery

Wadey VM, Dev P, Buckley R, Walker D, Hedden D. Competencies for a Core Curriculum in Orthopaedic Surgery: Competencies for a Canadian Orthopaedic Surgery Core Curriculum. J Bone Joint Surg Br. 2009 Dec;91(12):1618-22.

Appendix 3

AOAIOM Emergency Coverage Report

The report is available at the following URL address:
http://www.wsoa.org/postings/executivesummary.pdf

Appendix 4

ABOS Procedures for 2012

List of the top 15 procedures reported by those who were Part II candidates and those who are MOC diplomates (10 plus years in practice) in 2012

Part II candidates:

29881 Arthroscopy, knee, surgical; with meniscectomy (medial OR lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed

64721 Neuroplasty and/or transposition; median nerve at carpal tunnel

29826 Arthroscopy, shoulder, surgical; decompression of subacromial space with partial acromioplasty, with coracoacromial ligament (i.e., arch) release, when performed

20680 Removal of implant; deep (e.g., buried wire, pin, screw, metal band, nail, rod, or plate)

27447 Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)

29877 Arthroscopy, knee, surgical; debridement/shaving of articular cartilage (chondroplasty)

29888 Arthroscopically aided anterior cruciate ligament repair/augmentation or reconstruction

27236 Open treatment of femoral fracture, proximal end, neck, internal fixation or prosthetic replacement

11012 Debridement including removal of foreign material at the site of an open fracture and/or an open dislocation (e.g., excisional debridement); skin, subcutaneous tissue, muscle fascia, muscle, and bone for Grade I, II, IIIA and Grade IIIB)

27130 Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft

27245 Treatment of intertrochanteric, peritrochanteric, or subtrochanteric femoral fracture; with intramedullary implant, with or without interlocking screws and/or cerclage

29827 Arthroscopy, shoulder, surgical; with rotator cuff repair

29880 Arthroscopy, knee, surgical; with meniscectomy (medial AND lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed

26055 Tendon sheath incision (e.g., for trigger finger)

27244 Treatment of intertrochanteric, peritrochanteric, or subtrochanteric femoral fracture; with plate/screw type implant, with or without cerclage

MOC diplomates:

29881 Arthroscopy, knee, surgical; with meniscectomy (medial OR lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed

27447 Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)

29826 Arthroscopy, shoulder, surgical; decompression of subacromial space with partial acromioplasty, with coracoacromial ligament (i.e., arch) release, when performed

29877 Arthroscopy, knee, surgical; debridement/shaving of articular cartilage (chondroplasty)

27130 Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft

64721 Neuroplasty and/or transposition; median nerve at carpal tunnel

29880 Arthroscopy, knee, surgical; with meniscectomy (medial AND lateral, including any meniscal shaving) including debridement/shaving of articular cartilage (chondroplasty), same or separate compartment(s), when performed

29827 Arthroscopy, shoulder, surgical; with rotator cuff repair

20680 Removal of implant; deep (e.g., buried wire, pin, screw, metal band, nail, rod, or plate)

29888 Arthroscopically aided anterior cruciate ligament repair/augmentation or reconstruction

29824 Arthroscopy, shoulder, surgical; distal claviculectomy including distal articular surface (Mumford procedure)

63047 Laminectomy, facetectomy, and foraminotomy (unilateral or bilateral with decompression of spinal cord, cauda equina, and/or nerve root[s] [e.g., spinal or lateral recess stenosis]), single vertebral segment; lumbar

26055 Tendon sheath incision (e.g., for trigger finger)

22612 Arthrodesis, posterior or posterolateral technique, single level; lumbar (with lateral transverse technique, when performed)

29823 Arthroscopy, shoulder, surgical; debridement, extensive

Appendix 5

Definitions

The following are examples of the definition of minimal competency:

Example 1 – A lack of general resources might limit the ability of the general orthopaedic surgeon to provide acute care. A community without an available general surgeon to respond to a patient with major trauma would limit the orthopaedic surgeon's capacity to provide safe definitive care.

Example 2 – The general orthopaedic surgeon may deliver some forms of subspecialty care when it is not readily accessible to the patient/community.

Appendix 6

Adult Reconstruction

Musculoskeletal conditions that the general orthopaedic surgeon must be competent to evaluate and ensure the appropriate management is instituted are:

- Arthritis including rheumatoid and inflammatory arthropathies: This includes the competency of total joint arthroplasty of the hip and knee only if the surgeon elects to maintain this competency through CME activity, further training, and accepted case volumes to be considered competent by national standards
- Soft-tissue disorders such as bursitis, tendonitis, tenosynovitis, and enthesopathy
- Nerve entrapment at the wrist, elbow, and foot
- Infection
- Benign and malignant bone and soft-tissue tumors
- Deformity

Postoperative complications

A. The following are to be diagnosed and managed by the surgeon:

    - Acute painful joint replacement – acute care
    - Infection
    - Arthroplasty dislocation
    - Compartment syndrome

B. The following are to be diagnosed and referred for management

    - Deep venous thrombosis
    - Pulmonary emboli
    - Vascular injury
    - Nerve injury (may depend on surgeon interest and skill)
    - Ileus, acute myocardial infarction, cerebrovascular accident

C. Conditions the orthopaedic surgeon can diagnose and, based on interest and practice situation, refer or treat

    - Aseptic arthroplasty loosening

Appendix 7

Acute Orthopaedic Care Including Fracture Care

The general orthopaedic surgeon must be competent to evaluate and manage:

- Rapid/recent onset of major traumatic or non-traumatic extremity conditions of bone, joint/ligament, muscle/tendon, and nerve/vascular tissue as they relate to injury and other disease processes
- Fractures, open or closed, with or without nerve or vascular compromise
- Dislocations
- Joint instability
- Acute manifestations of pathologic bone disorders
- Infections
- Peri-operative complications

Timing of Orthopaedic Procedures

To ensure that all stakeholders have a common understanding of the urgency of orthopaedic evaluation, the following will clarify the timing of orthopaedic consultation. The designations of urgency range from “emergent” to “non-acute.” Each designation has an associated time frame and includes examples for concept clarification. This clarification of the standards for availability for consultation will help the surgeon involved in acute orthopaedic care to better achieve their professional competencies while informing those individuals referring cases to the orthopaedic professional.

Emergent (<1 hr) – Orthopaedic consultation is required emergently to prevent a high likelihood of loss of life, limb, or function

- Polytrauma – multiple systems trauma or extremity with multiple injuries
  - Damage Control Orthopaedics
- Fracture/dislocation with open, vascular, neurologic, skin compromise, compartment syndrome, mangled extremity
- Spine – unstable with or without spinal cord injury (SCI) so that instability is determined and temporary stabilization (not halo or traction) is ensured or institutional protocols are followed
- Soft-tissue injuries – degloving, crush
- Musculoskeletal infections with systemic decompensation or tissue necrosis (e.g., necrotizing fasciitis, clostridial myonecrosis, abscess under pressure, spinal/epidural abscess)

Urgent (<8 hrs) – Orthopaedic consultation is required urgently to prevent possible loss of limb or function

- Inflammatory – arthrosis with a differential that includes a septic joint
- Disc herniation with extreme pain or (progressive) neurologic loss
- Knee dislocation without vascular compromise

Expedient (<48 hrs) – Based on natural history, expedient orthopaedic care will improve patient outcomes; this care does not necessarily require Emergency Department (ED) consultation

- Blunt trauma – bone or soft tissue without associated fractures, e.g., grade 3 ankle sprain
- AC separation
- Moderate-severe flair of gouty arthrosis

Post Acute (1 week on) – Orthopaedic care is required, but the patient's condition is stable and allows referral within one week without risk of deterioration

- Ambulatory patient call for a specific injury (this includes patient self-referrals and referrals from community - non-ED - physicians).
- Non-displaced pediatric fracture that has been splinted in the ED
- Severe acute exacerbation of mechanical low back pain
- Following the acute phase of the condition when the associated acute care is substantially completed (may overlap with the acute phase and last weeks or months), the orthopaedist may not need to continue active participation in the care to the resolution of the disorder. The orthopaedist will effectively communicate ongoing orthopaedic management and anticipated requirements for further rehabilitation to those providing post-acute care

Non-Acute – Non-acute presentations may be referred non-urgently to an orthopaedist for care. The patient's condition does not require acute care.

- Stable conditions requiring reconstruction – arthroplasty, primary or revision (reduction of dislocated arthroplasty is acute)
- Stable deformity (non-acute)
- Posttraumatic or healing disorders
- Chronic infection that does not have imminent risk to life or limb
- Degenerative disorders
- Chronic inflammatory disorders
- Misuse/overuse conditions

- Heritable/congenital conditions

The cognitive knowledge competencies for acute care that are required of a general orthopaedic surgeon or an orthopaedic surgeon taking call for the ED or practice include:

- Basic principles of prosthetics and orthotics as they pertain to musculoskeletal injury
- Basic principles of musculoskeletal health including the structure and function of bone, joints, muscle, connective tissues, and disease processes
- Major indications, mechanisms of action, adverse effects, drug interactions, and contra-indications of drugs commonly used in the management of musculoskeletal conditions. This includes acute and chronic pain management, analgesics, antidepressants in pain management, corticosteroids, nonsteroidal anti-inflammatory drugs (NSAIDs), hypouricemic drugs, disease-modifying and cytotoxic drugs, viscosupplementation, and therapy for osteoporosis. Utilization of investigations for assessment and management of musculoskeletal disorders including serology, synovial fluid analysis, radiographs, arthrograms, MRI, bone scans, and ultrasound.

Operative competencies of an orthopaedic surgeon including the postoperative management

- ORIF of the ankle (bimalleolar/bimalleolar equivalent, trimalleolar/trimalleolar equivalent)
- Closed reduction and internal fixation (CRIF) of the femoral neck
- ORIF of the proximal femur (intertrochanteric and subtrochanteric fractures)
- Hemiarthroplasty of the hip and shoulder (cemented or uncemented)
- CRIF of the tibia and fibula (intramedullary [IM] nailing)
- CRIF of the femoral shaft (IM nailing)
- ORIF of the radius/ulna shaft
- ORIF of olecranon fractures
- ORIF of the distal radius and ulna
- ORIF of the proximal tibia (unicondylar tibial plateau fracture)
- ORIF of the humeral shaft, either plate or nail fixation
- ORIF of the distal femur (bicondylar intra-articular supracondylar fractures)
- ORIF of two-part fractures of the proximal humerus
- ORIF of the clavicle
- ORIF or replacement of the proximal radius
- ORIF of a transolecranon fracture/dislocation of the elbow
- Compartment releases of the upper and lower extremity

Appendix 8

Sports Medicine and Sports Surgery

A. Arthroscopy

The general orthopaedic surgeon must be competent:

- In the nerve, artery, and vein anatomy relative to portal placement
- To be aware of commonly expected variations of anatomy relative to portal placement
- In the knowledge of the most common complications of portal placement misadventure
- In commonly expected variations of intra-articular anatomy, which may be misidentified for pathology

The general orthopaedic surgeon will have an understanding of and be able to differentiate the following commonly expected arthroscopically identified conditions (not an exhaustive list):

- Synovitis
- Soft-tissue impingement(s)
- Instability (e.g., ACL)
- Mechanical (bone) impingement(s) (e.g., loose body)
- Pyogenic arthritis
- Crystalline arthritis
- Intra-articular tumors (i.e., chondromatosis, pigmented villonodular synovitis)
- Cartilage defect versus normal cartilage anatomy
- The role of cartilage injury repair versus cartilage injury resection
- When and where arthroscopic treatment of joint degeneration is appropriate
- When and where arthroscopic treatment of joint degeneration is inappropriate

The general orthopaedic surgeon will have an understanding of the epidemiology of, and practice prophylaxis against, the following:

- Instrument breakage
- Instrument failure
- Instrument misuse
- Infection
- Hemarthrosis
- Extra-articular hematoma
- Iatrogenic cartilage injury

- Iatrogenic nerve injury
- Iatrogenic arterial injury
- Iatrogenic venous injury
- Arthro-cutaneous fistula(e)/wound dehiscence
- Complications relative to patient position
- Complications relative to anesthetic technique choices
- Complications relative to traction techniques (when applicable)
- Complications relative to tourniquet techniques (when applicable)
- Compartment syndrome
- DVT
- Chronic regional pain syndrome

B. Sports Medicine Nonoperative

a. Head Injury

The general orthopaedic surgeon in the treatment of trauma patients and athletes will encounter scenarios of potential head injury and/or concussion. Even if the orthopaedic surgeon will not definitely manage these injuries, he or she must be competent to:

- Assess and manage the airway, breathing, and circulation as the first priority in management of the head-injured or unconscious patient or athlete
- Use an automated external defibrillator (AED) and ensure that the AED is readily available when covering athletic events and/or mass participation events where the general orthopaedist may encounter a suddenly collapsed athlete (e.g., football game) or spectator
- Assess the unconscious patient assuming him or her to be head injured until proven otherwise
- Assess the unconscious patient, assuming him or her to have a spine injury until proven otherwise
- Logroll a prone-lying patient or athlete with cervical stabilization, assuming a potential spine injury, to a supine posture for definitive evaluation and support
- Diagnose and manage a concussion, understanding that it is defined as disturbance in brain function caused by a direct or indirect force to the head resulting in a variety of non-specific complaints or signs and most often does not involve the loss of consciousness. Concussion should be suspected in the presence of any one or more of the following:
    - Symptoms (e.g., headache)
    - Physical signs (e.g., unsteadiness)
    - Impaired brain function (e.g., confusion)

- Abnormal behavior (e.g., change in personality)

- While the manifestations of concussion can vary widely, the most common symptoms are headache and dizziness
- Loss of consciousness is not needed to diagnose concussion; 90% of concussions do not involve loss of consciousness
- Any athlete suffering from symptoms consistent with a diagnosis of concussion or a more significant head injury (e.g., subdural hematoma) should be withheld from participation
- An appropriate sideline evaluation for traumatic brain injury should include the following components: (1) history and symptom evaluation including a Glasgow Coma Scale (GCS) assessment, (2) cognitive and physical examination, and (3) balance and coordination assessment
- The Standardized Concussion Assessment Tool 3 (SCAT 3) or the Child SCAT 3 (used for children <13 years old) is recommended as appropriate sideline concussion evaluation tests
- An athlete diagnosed with a concussion should not return to play on the same day
- Once the athlete has complete resolution of concussion symptoms at rest and has been medically cleared, a stepwise supervised return to sports program with stages of progression may begin

b. Exercise-Induced Injuries

The general orthopaedic surgeon will be competent to:

- Assess and manage exercise-induced leg compartment syndrome (chronic exertional compartment syndrome), understanding it is a diagnosis of exclusion from muscle hernias, radiculopathy, peripheral nerve entrapments, stress fractures, vascular claudication, periostitis, tendinopathy, or exercise-associated muscle cramping (not an exhaustive list)
- Perform compartmental pressure measurements following exercise as the diagnostically most accurate tool
- Perform surgical decompression of the involved compartment(s), which is the mainstay of treatment of exercise-induced leg compartment syndrome (for athletes unwilling to cease the offending sport)
- Discuss non-surgical treatment, realizing that there is no strong evidence existing for orthotics, physical therapy, or medications in the definitive treatment of exercise-induced leg compartment syndrome

c. Insidious Extremity Pain

The general orthopaedic surgeon will be competent to:

- Assess and manage stress fractures, which are strain-induced fatigue failures of bone; rest is critical to treatment
- The most common locations are metatarsals and posteromedial tibial diaphysis; other potential at-risk sites for a complete fracture are the superior portion of the femoral neck (tension side), talar neck, medial malleolus, tarsal navicular, and anterior tibial diaphysis (tension side); these sites may require surgery sooner than later
- Many imaging modalities have unique features suitable for stress fracture diagnosis including, but not limited to, CT, MRI, nuclear imaging, and plain radiography (not an exhaustive list)
- The role of external treatment modalities (electrical stimulation, ultrasound, etc.) is unproven
- Understand that stress fractures may be a presenting sign of other underlying medical conditions such as the Female Athlete Triad or metabolic bone disease
- The Female Athlete Triad is a spectrum of interrelated medical conditions that includes: (1) low energy with or without disordered eating or an eating disorder, (2) menstrual dysfunction, and (3) bone loss
- Understand the clinical differences between stress remodeling and stress fracture

Appendix 9

Pediatrics

The following are a list of conditions that the general orthopaedic surgeon must be competent in the evaluation and subsequent referral to definitive care:

- Slipped capital femoral epiphysis
- Developmental dysplasia of the hip (DDH)
- Perthes disease
- Skeletal dysplasias
- Osteomyelitis and septic joints
- Clubfoot
- Fractures about the hip, displaced growth plate injuries
- All pediatric spine problems
- Genetic problems

Appendix 10

Spine

The following are the competencies that a general orthopaedic surgeon must have for the assessment of the spine:

- Knowledge of dermatome distributions
- Knowledge of myotome distributions
- Able to elicit the major reflexes – knee, Babinski, ankle, and elbow
- Able to perform the straight leg raise test and know its significance
- Able to perform the crossed straight leg raise test and know its significance
- Able to perform a Spurling's test
- Able to elicit Waddell's criteria
- Diagnose gait abnormalities with a myelopathy
- Able to perform motor strength grading
- Know what are the pathologic reflex responses
- To perform a safe neurological examination and apply protective measures to a patient suspected of spine trauma

The general orthopaedic surgeon will be competent in assessing and initiating appropriate care for the following spinal conditions:

- Rheumatoid disease related to the cervical spine
- Asymmetric sacroiliitis inferring Reiter's syndrome
- Nonmarginal syndesmophytes inferring diffuse idiopathic skeletal hyperostosis
- Symmetric sacroiliitis and bamboo spine changes inferring ankylosing spondylitis
- The sudden onset spine pain in the presence of ankylosing spondylitis (fracture)
- Spine fractures in the presence of ankylosing spondylitis (epidural hematoma)
- Adult initial low back pain
- Adult spondylolisthesis and its variants
- Common types of lumbar disc herniations: central, paracentral, extraforaminal, and intraforaminal
- Cervical myelopathy and need for referral for operative treatment

The general orthopaedic surgeon must understand:

- The role of and benefits/risks for NSAIDs, mobilization

- The role of imaging for initial low back pain without “red flags”
- The role of opiate requirements (rare), antidepressants (chronic back pain), anticonvulsants (neuropathic back pain), and oral steroids (radicular back pain)
- Emergent spine decompression indications (progressive neurologic deficit and cauda equina syndrome)
- The role of steroid use in acute spinal injury is no longer recommended according to Advanced Trauma Life Support (ATLS) protocol

Traumatic situations and acute conditions that the general orthopaedic surgeon will be competent in assessing and managing acutely with appropriate referral:

- Traumatic spine syndromes
    - Brown-Sequard
    - Central cord
    - Anterior cord
- Traumatic spine injuries
    - Atlantoaxial instability
    - Hangman’s fractures
    - Odontoid fractures
    - Nondisplaced spine fractures
    - Burst fractures
    - Fracture dislocations of the spine

The orthopaedic surgeon must have:

- Vigilance for occult abdominal injuries with high-energy thoracic and lumbar spine injuries (and vice versa)
- Vigilance for occult chest and upper extremity injuries with high-energy cervical spine injuries (and vice versa)
- Vigilance for noncontiguous spine injuries in high-energy trauma
- An understanding of the need for blood pressure support in early spinal cord injury

The investigations for spinal pathology that the general orthopaedic surgeon will be competent to order and interpret are:

- Radiograph
- CT scanning
- MRI
- Myelography combined with CT
- The role of gadolinium-enhanced MRI

- The preference of posteroanterior over anteroposterior radiograph imaging, when practical
- Nuclear medicine imaging

The spinal infection conditions that a general orthopaedic surgeon should be competent to diagnosis, and provide acute nonoperative care for are:

- Suspicion of spinal infection
- Postoperative epidural
- Osteomyelitis
- Discitis

The general orthopaedic surgeon will be competent to assess and manage the nonoperative aspects of osteoporosis and spinal tumors as listed below:

- Thoracic fragility fractures and their typical radiographic appearance
    - The role of nuclear imaging or MRI
    - Pulmonary implications
    - Nerve root implications
    - The indications of referral for kyphoplasty or vertebroplasty
- Lumbar fragility fractures and their typical radiographic appearance
    - The role of nuclear imaging or MRI
    - Nerve root implications
    - The indications of referral for kyphoplasty or vertebroplasty
- Initial evaluation of and differential diagnosis of spinal tumors
    - Metastatic cancers
    - Myeloid cancers
    - Primary malignant tumors of the spine
    - Primary benign tumors of the spine
    - Initial evaluation differentiating spine fractures from spine tumors

Appendix 11

Foot and Ankle

With regard to common injuries, a general orthopaedic surgeon must be competent to:

- Diagnose and treat, both nonoperatively and operatively, minimally displaced closed Lisfranc dislocation
- Diagnose and treat, both nonoperatively and operatively, a calcaneal anterior process fracture

- Diagnose and treat, both nonoperatively and operatively, toe MTP dislocation and fifth metatarsal fractures
- Diagnose and treat, both nonoperatively and operatively, ankle fractures: all malleolar fractures (excluding plafond or talar body fractures)
- Diagnose and treat, both nonoperatively and operatively, minimally displaced closed talar neck fractures
- Diagnose and treat, both nonoperatively and operatively, an acute uncomplicated Achilles tendon rupture or avulsion

With regard to common non-traumatic conditions of the foot and ankle, a general orthopaedic surgeon must be competent to:

- Diagnose and treat, both nonoperatively and operatively, an interdigital neuroma
- Diagnose and treat, both nonoperatively and operatively, a bunion (hallux valgus)
- Diagnose and treat, both nonoperatively and operatively, a hammer toe
- Diagnose and treat, both nonoperatively and operatively, a bunionette
- Diagnose and treat, both nonoperatively and operatively, a bone spur of the great toe, anterior ankle, and Achilles insertion
- Diagnose and treat, both nonoperatively and operatively, a dorsal ganglion of the foot or ankle
- Diagnose and treat, both nonoperatively and operatively, dislocating peroneal tendons
- Diagnose and treat, both nonoperatively and operatively, Achilles tendon bursitis
- Diagnose and treat, both nonoperatively and operatively, uncomplicated primary lateral ankle instability
- Diagnose and treat, both nonoperatively and operatively, one or more loose bodies of the ankle

With regard to both traumatic and non-traumatic injuries, a general orthopaedic surgeon must be competent to:

- Diagnose and treat nonoperatively an ankle sprain
- Diagnose and treat nonoperatively an acute Achilles tendonitis
- Diagnose and treat nonoperatively heel pain (fasciitis)
- Diagnose and treat nonoperatively an acute tendonitis/arthritis
- Diagnose and refer drop foot
- Diagnose and treat a stress fracture: metatarsal, navicular, calcaneus, and ankle
- Diagnose and refer chronic diabetic foot and ankle problems

Appendix 12

Hand

The general orthopaedic surgeon must be competent to:

- Perform a history and physical examination of the hand
- Diagnose traumatic hand injuries
- Diagnose inflammatory and non-inflammatory arthritis of the hand
- Diagnose nerve compression problems of the hand
- Diagnose vascular problems of the hand
- Diagnose infections of the hand
- Understand the principles of management of emergent traumatic conditions of the hand
- Determine the appropriate treatment for traumatic conditions of the hand; refer nonoperative or operative cases based on training, practice situation, and acuteness of injury
- Determine the appropriate treatment for non-traumatic conditions of the hand; refer nonoperative or operative cases based on training, practice situation, and acuteness of injury
- Understand the principles of amputation for emergent hand problems
- Understand the pathophysiology and diagnosis of hand compartment syndromes

The procedural competencies required by a general orthopaedic surgeon for Management 2 are:

- Skin and subcutaneous tissue procedures
    - Free skin graft
    - Fingertip injuries without flaps
    - Debridement of open hand injuries if appropriate due to acuteness, practice situation, and training
    - Decompression of the hand for a hand compartment syndrome

- Tendon procedures
    - Trigger finger releases
    - Extensor tendon repairs

- Bone and joint procedures
    - Closed reductions and closed management of fractures and dislocations
    - ORIF of fractures of the hand and wrist if appropriate due to acuteness, practice situation, and training

- Closed reduction and splinting of complex fractures and fracture dislocations followed by referral

- Nerve procedures
  - Decompression of the carpal tunnel, Guyon's canal, and ulnar nerve transposition
  - Infection
    - Surgical management of paronychia, pulp space infection, and tendon sheath infection
    - Drainage of septic arthritis of proximal interphalangeal, metacarpophalangeal, and carpal joints

Appendix 13

Office-Based Practice

1. Evaluations

Using a history, physical examination, interpretation of imaging, and laboratory results, the general orthopaedic surgeon will need to be competent in assessing general orthopaedic conditions of the spine and extremities with the associated conditions:

- Metabolic bone disease - recognition
- Osteoporosis
  - Knowledge
  - Counseling
- Autoimmune conditions/inflammatory diseases
- Congenital deformities
- Infections
- Pediatric acute and chronic conditions
- Primary bone tumor assessment
- Metastatic bone tumor diagnosis and management
- Initiate and develop treatment plans and appropriate consultation for higher level of care as needed for these situations

The following are the competencies that the general orthopaedic surgeon must have to adequately practice:

1. Evaluations

   a. History

- Common constellations of symptoms and associated conditions
- Natural history of condition
- Prognostic/risk-related factors
- Comorbidities

b. Physical examination

- Posture, gross contours/alignment/symmetry
- Anatomic landmarks and specific anatomic structures
- Location, shape, consistency, crepitus, tenderness
- Alignment: position, angular or translation, related to all 3 axes
- Range of motion (ROM)
  - Rotations (translations for accessory motions) about all 3 axes
  - Accessory vs. functional ROM
  - Anatomic position, zero or neutral point
  - Expected ROM
  - Use of goniometer
  - Passive, assisted, active ROM
  - Neuromuscular vs. mechanical loss
  - Structural vs. peri-articular fibrosis vs. muscle-tendon shortening
- Joint stability
  - Knee
  - Shoulder
  - Ankle
  - Hip
  - Elbow
  - Foot
  - Wrist
  - Hand
- Motion within or beyond expected for all range of motion
- Specific loading patterns to test specific joint stabilizers
  - Varus/valgus stress for collaterals at specific joint positions
  - Drawer for AP stability cruciates
  - Load translation testing
  - Distractions
  - Pivots
- Vascular screening
  - Every examination, every patient, every limb
  - Perfusion AND pulses

Distal to area of injury or disorder
Specific vessels and perfusion zones expected for specific vessels
Arterial and venous
Collateral perfusion assessment (Allan's test)
Advanced vascular assessment when screening is positive
Focused detailed evaluation for known vascular compromise or conditions with high association of vascular compromise
Ankle Brachial Index, Ankle Arm Index, Doppler
Injury, peripheral vascular disease, vasculitis

- Neurologic screening
  - Every examination, every patient, every limb
  - Motor and sensory (reflexes)
  - Root and peripheral nerve distributions
  - Plexus (brachial, lumbosacral)
    - Common variations (Martin-Gruber, Rich-Cannaux, pre/post fixed)
    - Autonomous sensory zones
    - Exclusive motor innervation
    - Advanced neurologic examination for positive screening
    - Focused detailed evaluation for known neurologic deficit or conditions with high association of neurologic involvement
- Nerve conduction study/electromyography
- Neuropathy vs. injury
  - Neurapraxia, axonotmesis, neurotmesis

<u>Special Tests of Joint Instability</u>

It is recommended that general orthopaedic surgeons be competent in all specific physical examination tests for specific pathology of any joint as they are the primary surgeons to assess individuals with musculoskeletal problems. Some tests are more specific to the subspecialty, but the general orthopaedic surgeon still needs to be aware of these and try to be competent in applying them. Examples are:

- Lachman's vs. pivot shift, impingement vs. test for labral tear

Routine imaging

- Radiographs
  - arthrograms, myelogram, venogram
  - contrast agents
  - radiation safety

- Nuclear medicine imaging
- Radiation safety
- Ultrasound, Doppler
- Must be competent to determine the common findings for normal, variants, and common disorders
- Must be competent in understanding the basic science of routine imaging to be able to avoid excessive radiation to the patient, associated health care workers, and the surgeon

Advanced imaging

- CT, CT angiogram
- MRI, MR arthrogram
- Contrast agents
- PET-CT, positron agents
- SPECT-CT
- Must be competent to determine the common findings for normal, variants, and common disorders
- Must be competent in understanding the basic science of advanced imaging to be able to avoid excessive radiation to the patient, associated health care workers, and the surgeon

Special tests

- Laboratory testing
  - Serology
  - Acute inflammatory indicators
  - Hematology
  - Synovial fluid analysis
  - Genetic testing
  - HLA B27 vs. syndromic mutations
  - Cytology/histology
  - Rheumatologic indicators
  - Immune response
  - Mechanism for tests such as ELISA, blots, immunofluorescence
  - Physiology underlying test mechanisms and abnormal findings

Records review

Response to trial of therapy

Impairment

- Physical limitation
- Functional impairment
- AMA Guidelines for Impairment or state or other local guidelines

Work/sport evaluation

- Pre-sport or pre-work evaluations
- Sport or work-specific considerations,
- Altitude, contact sport, endurance, heavy lifting, dehydration/heat exposure
- Disorder/patient-specific considerations
- Down's syndrome, sickle cell anemia, spinal disorders, cardiac disorders

Appendix 14

General Orthopaedic Competency Task Force Survey of Controversial Competencies

Results of Survey on Controversial Competencies

Available respondents: The questionnaire was sent to all the GOCTF members, but the non-surgical members felt that they did not have the knowledge to provide a valid opinion so declined to vote. Nine of the 10 surgical members of the GOCTF answered the questionnaire.

The results are presented as a list and then broken down into the following fields:

- Adult Reconstruction
- Acute Orthopaedic Care Including Fracture Care
- Pediatrics
- Sports Medicine and Sports Surgery
- Foot and Ankle
- Spine
- Professionalism

Results = Percentage Yes/Percentage No

Above and below knee amputations	100%/0%
Hemiarthroplasty for femoral neck fractures	100%/0%
Pediatric spinal evaluation	100%/0%
Pediatric hip evaluation	100%/0%

An understanding of spinal infection	100%/0%
Pediatric foot and ankle evaluation	100%/0%
Above and below knee amputations	100%/0%
Understanding and application of bone stimulation	100%/0%
Culturally and gender competent care	100%/0%
Professional expert testimony	100%/0%
Disability evaluations	100%/0%
Order and interpret nerve conduction and EMG studies	100%/0%
Intertrochanteric and femoral neck ORIF	100%/0%
ORIF of adult distal radial fractures	100%/0%
ORIF of adult distal radial fractures	100%/0%
Synovectomy of the knee	90%/10%
Arthroscopic anterior cruciate repair	89%/11%
ORIF of metacarpal fractures	89%/11%
Hemiarthroplasty of the shoulder	89%/11%
Biopsy of soft tissue or bone	80%/20%
ORIF of the proximal radius	78%/22%
Pediatric initial care of intertrochanteric fracture	78%/22%
Management of slipped capital femoral epiphysis	78%/22%
Management of triplane fractures	78%/22%
ORIF of transolecranon fractures/dislocations of the elbow	78%/22%
Pediatric developmental dysplasia of the hip evaluation	67%/33%

Diagnostic ankle arthroscopy	67%/33%
Metatarsophalangeal fusion	67%/33%
Ankle arthrodesis	67%/33%
Hypouricemic drugs	67%/33%
Antidepressants used for pain management	67%/33%
ORIF of distal humeral fractures including intra-articular	67%/33%
Operative management of malunions	56%/44%
Subtalar arthrodesis	56%/44%
Arthroscopic repair of rotator cuff and SLAP lesions	56%/44%
Diagnosis of destructive spine conditions	56%/44%
Open repair of a dislocated elbow	56%/44%
Primary unicompartmental total knee arthroplasty	56%/44%
Corrective foot surgery	56%/44%
Osteotomy: adult femoral or tibia	44%/56%
Management of metabolic bone disease including osteoporosis	44%/56%
Primary total shoulder	44%/56%
Upper amputation surgery	44%/56%
ORIF of periprosthetic fractures	33%/67%
ORIF of periprosthetic hip fracture	37%/63%
ORIF of periprosthetic fractures about the knee	44%/56%
Arthroscopic-assisted ankle treatment	33%/67%
Triple arthrodesis	33%/67%
Lumbar spine decompression	22%/78%

Discectomy: cervical or lumbar	22%/78%
Arthroscopic-assisted elbow treatment	11%/89%
Diagnostic elbow arthroscopy	33%/67%
Arthroscopic-assisted wrist treatment	11%/89%
Arthroscopic multi-ligament repair	11%/89%
Cervical spine decompression	11%/89%
Revision of total hip arthroplasty	0%/100%
Reverse total shoulder	0%/100%
Arthroscopic-assisted hip treatment	0%/100%

Adult Reconstruction

Hemiarthroplasty for femoral neck fractures	100%/0%
Above and below knee amputations	100%/0%
Above and below knee amputations	100%/0%
Synovectomy of the knee	90%/10%
Hemiarthroplasty of the shoulder	89%/11%
Biopsy of soft tissue or bone	80%/20%
Primary unicompartmental total knee arthroplasty	56%/44%
Operative management of malunions	56%/44%
Primary total shoulder	44%/56%
Osteotomy: adult femur or tibia	44%/56%
Upper amputation surgery	44%/56%
Reverse total shoulder	0%/100%

Revision of total hip arthroplasty	0%/100%
<u>Acute Orthopaedic Care Including Fracture Care</u>	
Hemiarthroplasty for femoral neck fractures	100%/0%
Intertrochanteric and femoral neck ORIF	100%/0%
ORIF of adult distal radial fractures	100%/0%
ORIF of adult distal radial fractures	100%/0%
Understanding and application of bone stimulation	100%/0%
ORIF of metacarpal fractures	89%/11%
Hemiarthroplasty of the shoulder	89%/11%
ORIF of the proximal radius	78%/22%
Pediatric initial care of intertrochanteric fracture	78%/22%
Management of slipped capital femoral epiphysis	78%/22%
Management of triplane fractures	78%/22%
ORIF of transolecranon fractures/dislocations of the elbow	78%/22%
ORIF of distal humeral fractures including intra-articular	67%/33%
Open repair of a dislocated elbow	56%/44%
Operative management of malunions	56%/44%
ORIF of periprosthetic fractures	33%/67%
ORIF of periprosthetic hip fracture	37%/63%
ORIF of periprosthetic fractures about the knee	44%/56%
<u>Pediatrics</u>	
Pediatric spinal evaluation	100%/0%
Pediatric hip evaluation	100%/0%

Pediatric foot and ankle evaluation	100%/0%
Pediatric initial care of intertrochanteric fracture	78%/22%
Management of slipped capital femoral epiphysis	78%/22%
Management of triplane fractures	78%/22%
Pediatric developmental dysplasia of the hip evaluation	67%/33%
<u>Sports Medicine and Sports Surgery</u>	
Arthroscopic anterior cruciate repair	89%/11%
Diagnostic ankle arthroscopy	67%/33%
Arthroscopic repair of rotator cuff and SLAP lesions	56%/44%
Arthroscopic-assisted ankle treatment	33%/67%
Diagnostic elbow arthroscopy	33%/67%
Arthroscopic-assisted elbow treatment	11%/89%
Arthroscopic-assisted wrist treatment	11%/89%
Arthroscopic multi-ligament repair	11%/89%
Arthroscopic-assisted hip treatment	0%/100%
<u>Foot and Ankle</u>	
Pediatric foot and ankle evaluation	100%/0%
Diagnostic ankle arthroscopy	67%/33%
Metatarsophalangeal fusion	67%/33%
Ankle arthrodesis	67%/33%
Subtalar arthrodesis	56%/44%
Corrective foot surgery	56%/44%

Arthroscopic-assisted ankle treatment	33%/67%
Triple arthrodesis	33%/67%
Spine	
Pediatric spinal evaluation	100%/0%
An understanding of spinal infection	100%/0%
Diagnosis of destructive spine conditions	56%/44%
Lumbar spine decompression	22%/78%
Discectomy: cervical or lumbar	22%/78%
Cervical spine decompression	11%/89%
Professional Competencies	
Culturally and gender competent care	100%/0%
Professional expert testimony	100%/0%
Disability evaluations	100%/0%
Order and interpret nerve conduction and EMG studies	100%/0%
Understand the use of hypouricemic drugs	67%/33%
Antidepressants used for pain management	67%/33%
Management of metabolic bone disease including osteoporosis	44%/56%

Appendix 15

Survey Results Tables

Each question representing a competency had 5 possible answers as follows:

- Mandatory: Essential for an orthopaedic surgeon to be able to perform to practice orthopaedic surgery

- Should be competent: This competency would be helpful for the orthopaedic surgeon to have but not necessary for practice
- Helpful to broaden scope: This competency would be considered a bonus for an orthopaedic surgeon to have to practice
- Subspecialty: This competency is expected to be performed only after subspecialty training
- Unnecessary: This competency would not be useful for an orthopaedic surgical practice

Each answer was given a score ranging from 1 = unnecessary to 5 = mandatory. The rank is the average of the scores for each question.

A. Tables: Rank ≥3.5 and 50% Mandatory

Table 1: Adult Reconstruction

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Hemiarthroplasty of the hip (cemented or uncemented)	**66.9%**	27.6%	2.4%	2.4%	0.8%	**4.57**
Arthrotomy of the shoulder, elbow, or wrist	**58.3%**	31.5%	6.3%	3.1%	0.8%	**4.43**
Excision of a benign lesion, e.g., Baker's cyst, bursae, ganglion	43.3%	40.2%	9.4%	5.5%	1.6%	**4.18**
Pathological fracture	42.2%	38.3%	8.6%	10.9%	0.0%	**4.12**
Primary total hip arthroplasty (cemented or uncemented)	37.3%	42.1%	14.3%	5.6%	0.8%	**4.10**
Primary total knee arthroplasty (cemented or uncemented)	37.6%	41.6%	14.4%	4.8%	1.6%	**4.09**
Delayed union and non-union	37.7%	38.5%	11.5%	11.5%	0.8%	**4.01**
Fracture secondary to a gunshot wound	21.1%	47.7%	16.4%	14.1%	0.8%	**3.74**

Table 2: Acute Orthopaedic Care Including Fracture Care

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Suturing skills	**96.2%**	3.1%	0.8%	0.0%	0.0%	**4.95**
Joint injections and	**94.6%**	3.9%	0.0%	1.6%	0.0%	**4.91**

aspirations						
A closed reduction of fractures and dislocated joints with an understanding of the principles of management and when to refer for subspecialty care	**89.1%**	9.3%	0.0%	0.8%	0.8%	**4.85**
An above or below elbow cast, or an above or below knee cast, for the purpose of nonoperative management of upper and lower extremity fractures	**88.4%**	8.5%	1.6%	0.8%	0.8%	**4.83**
Common adult fractures	**82.4%**	16.0%	0.0%	1.5%	0.0%	**4.79**
Joint dislocations	**82.3%**	15.4%	0.0%	2.3%	0.0%	**4.78**
ORIF of the ankle (bimalleolar/bimalleolar equivalent, trimalleolar/trimalleolar equivalent)	**73.0%**	24.6%	0.8%	1.6%	0.0%	**4.69**
Soft-tissue injuries	**73.6%**	24.0%	0.0%	2.3%	0.0%	**4.69**
CRIF of the femoral neck	**72.2%**	24.6%	1.6%	0.8%	0.8%	**4.67**
Debridement of a Grade I, II, and IIIA open fracture of any bone or joint	**73.2%**	20.5%	4.7%	1.6%	0.0%	**4.65**
ORIF of the proximal femur (intertrochanteric and subtrochanteric fractures)	**69.3%**	25.2%	3.1%	1.6%	0.8%	**4.61**
Peritendon injections	**70.8%**	20.0%	5.4%	3.1%	0.8%	**4.57**
CRIF of the tibia and fibula (IM nailing)	**65.6%**	28.1%	3.9%	1.6%	0.8%	**4.56**
CRIF of the femoral shaft (IM nailing)	**65.6%**	25.8%	7.0%	0.8%	0.8%	**4.55**
ORIF of the patella	**61.6%**	31.2%	3.2%	3.2%	0.8%	**4.50**
ORIF of the radius/ulna shaft	**54.8%**	36.5%	4.8%	3.2%	0.8%	**4.41**
Debridement of a Grade IIIB open fracture of any bone or joint	**55.5%**	25.0%	5.5%	13.3%	0.8%	**4.21**

Table 3: Sports Medicine and Sports Surgery

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Diagnostic arthroscopy of the knee	**59.5%**	31.7%	4.8%	2.4%	1.6%	**4.45**
Arthroscopic meniscectomy and debridement of the knee	**58.3%**	32.3%	6.3%	1.6%	1.6%	**4.44**

Table 4: Pediatrics

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Closed reduction of the distal radius and ulna with cast immobilization	**62.8%**	31.4%	2.5%	3.3%	0.0%	**4.54**
Closed reduction of the radial shaft and/or ulna shaft with cast immobilization	**58.3%**	36.7%	2.5%	2.5%	0.0%	**4.51**
Non-accidental trauma	**55.0%**	35.0%	5.0%	5.0%	0.0%	**4.40**
Compartment releases of the upper and lower extremity	**56.6%**	23.8%	5.7%	12.3%	1.6%	**4.21**
Compartment releases of the upper and lower extremity	**54.5%**	24.0%	6.6%	13.2%	1.7%	**4.17**

Table 5: Spine
No competencies meet criteria

Table 6: Foot and Ankle
No competencies meet criteria

Table 7: Hand

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Carpel tunnel release at the wrist	**52.4%**	36.5%	7.1%	3.2%	0.8%	**4.37**

Table 8: Clinical Assessment and Diagnosis

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Order and understand the interpretation of radiographs	**94.0%**	4.5%	0.0%	1.5%	0.0%	**4.91**
Identify normality and abnormality by a comprehensive physical examination of the musculoskeletal system which includes assessment of pain, tenderness, swelling, dislocation, displacement, deformity, muscle wasting, weakness, abnormal movement, and functional impairment	**88.9%**	8.9%	0.7%	1.5%	0.0%	**4.85**
Take a relevant history in terms of impairment of function, limitation of activities, and restriction of participation for major conditions of bone, joints, and connective nerve and muscle tissue as they relate to both acute and chronic injury or other disease processes	**85.9%**	9.6%	1.5%	1.5%	1.5%	**4.77**
Order and understand the interpretation of synovial fluid analysis	**67.9%**	27.6%	3.0%	1.5%	0.0%	**4.62**
Order and understand the interpretation of basic blood tests such as hemoglobin, erythrocyte sedimentation rate, C-reactive protein, electrolytes, liver and renal function, and bone metabolism studies	**66.7%**	28.9%	3.0%	1.5%	0.0%	**4.61**
Order and understand the	**54.5%**	44.0%	0.0%	1.5%	0.0%	**4.51**

interpretation of computer tomography scans						
Order and understand the interpretation of magnetic resonance imaging (MRI)	**52.2%**	44.0%	2.2%	1.5%	0.0%	**4.47**

Table 9: Emergency Conditions

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Joint infection	**89.8%**	7.8%	0.0%	2.3%	0.0%	**4.85**
Compartment syndrome	**86.9%**	10.8%	0.0%	2.3%	0.0%	**4.82**
Open fractures	**84.2%**	12.8%	0.8%	2.3%	0.0%	**4.79**
Soft-tissue infection	**76.3%**	19.8%	1.5%	1.5%	0.8%	**4.69**
Fasciotomy for compartment syndrome of the lower extremity	**72.4%**	24.4%	0.8%	2.4%	0.0%	**4.67**
Bone infection	**70.5%**	25.0%	2.3%	2.3%	0.0%	**4.64**
Acute nerve or vascular compromise	**69.9%**	18.0%	2.3%	7.5%	2.3%	**4.46**
Fasciotomy for compartment syndrome of the upper extremity	**59.8%**	29.1%	3.9%	6.3%	0.8%	**4.41**

Table 10: Tumors
No competencies meet criteria

Table 11: Communication, Education, and Research

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Is it important to your practice to obtain ongoing continuing medical education (CME)?	**87.0%**	9.8%	2.4%	0.8%	0.0%	**4.83**
Is patient education an effective skill for communicating and teaching your patients?	**80.0%**	17.5%	2.5%	0.0%	0.0%	**4.78**

Is it important to your practice that you teach and communicate effectively with peers?	**71.1%**	24.8%	4.1%	0.0%	0.0%	**4.67**
Is it important for you to use skills provided in the literature for critical appraisals?	**62.3%**	30.3%	6.6%	0.8%	0.0%	**4.54**
Is it important to your practice that you teach and communicate effectively with non-peer groups?	**60.2%**	34.1%	4.1%	0.0%	1.6%	**4.51**

B. Tables: Complete Results by Area of General Orthopaedic Practice

Table 1: Adult Reconstruction

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Hemiarthroplasty of the hip (cemented or uncemented)	**66.9%**	27.6%	2.4%	2.4%	0.8%	**4.57**
Arthrotomy of the shoulder, elbow, or wrist	**58.3%**	31.5%	6.3%	3.1%	0.8%	**4.43**
Excision of a benign lesion, e.g., Baker's cyst, bursae, ganglion	43.3%	40.2%	9.4%	5.5%	1.6%	**4.18**
Pathological fracture	42.2%	38.3%	8.6%	10.9%	0.0%	**4.12**
Primary total hip arthroplasty (cemented or uncemented)	37.3%	42.1%	14.3%	5.6%	0.8%	**4.10**
Primary total knee arthroplasty (cemented or uncemented)	37.6%	41.6%	14.4%	4.8%	1.6%	**4.09**
Delayed union and non-union	37.7%	38.5%	11.5%	11.5%	0.8%	**4.01**
Fracture secondary to a gunshot wound	21.1%	47.7%	16.4%	14.1%	0.8%	**3.74**
Foot amputation	19.5%	39.8%	19.5%	10.6%	10.6%	3.47
Hemiarthroplasty of the shoulder	13.5%	36.5%	28.6%	19.8%	1.6%	3.40
Malunion	21.9%	25.8%	23.4%	26.6%	2.3%	3.38

Removal of a total knee prosthesis for infection and insertion of an antibiotic spacer	18.9%	28.3%	22.0%	26.0%	4.7%	3.31
Synovectomy of the lower extremity joints	12.7%	31.0%	27.0%	24.6%	4.8%	3.22
Removal of a total hip prosthesis for infection and insertion of an antibiotic spacer	16.7%	27.0%	22.2%	29.4%	4.8%	3.21
Synovectomy of the upper extremity joints not including the hand	11.9%	20.6%	27.8%	33.3%	6.3%	2.98
Non-union with a large bony defect	15.4%	20.0%	11.5%	49.2%	3.8%	2.94
Primary unicompartmental arthroplasty of the knee	9.4%	16.5%	38.6%	27.6%	7.9%	2.92
Excision of a lesion, such as a tumor, in the muscle, tendon, or fascia	6.3%	22.2%	17.5%	45.2%	8.7%	2.72
Amputation of lower extremity excluding hip disarticulation and hemipelvectomy	15.4%	17.1%	8.1%	32.5%	26.8%	2.62
Primary total shoulder arthroplasty	4.7%	14.2%	25.2%	48.0%	7.9%	2.60
Revision arthroplasty of the hip	5.6%	7.9%	26.2%	43.7%	16.7%	2.42
Revision arthroplasty of the knee	4.9%	8.2%	27.0%	43.4%	16.4%	2.42
Amputation of upper extremity excluding a forequarter amputation	4.9%	16.3%	10.6%	43.1%	25.2%	2.33
Knee arthrodesis	1.6%	8.2%	19.7%	47.5%	23.0%	2.18
Hip amputation	1.6%	12.2%	14.6%	43.1%	28.5%	2.15
Reverse total shoulder	2.4%	4.8%	14.3%	60.3%	18.3%	2.13
Primary ankle arthroplasty	2.4%	0.8%	6.5%	62.1%	28.2%	1.87
Hip arthrodesis	1.6%	2.5%	9.8%	52.5%	33.6%	1.86
Primary arthroplasty of the elbow	0.8%	1.6%	7.1%	60.6%	29.9%	1.83
Arthroplasty of the joints of the hand, e.g., fingers	0.8%	0.0%	3.9%	70.9%	24.4%	1.82
Tendon transfers in the	0.8%	0.8%	6.3%	63.5%	28.6%	1.82

area of the elbow						
Revision arthroplasty of the shoulder	1.6%	0.8%	3.2%	65.6%	28.8%	1.81
Revision arthroplasty of the ankle	0.8%	0.8%	3.2%	62.1%	33.1%	1.74
Revision arthroplasty of the elbow	1.6%	0.0%	0.8%	62.7%	34.9%	1.71

Table 2: Acute Orthopaedic Care Including Fracture Care

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Suturing skills	**96.2%**	3.1%	0.8%	0.0%	0.0%	**4.95**
Joint injections and aspirations	**94.6%**	3.9%	0.0%	1.6%	0.0%	**4.91**
A closed reduction of fractures and dislocated joints with an understanding of the principles of management and when to refer for subspecialty care	**89.1%**	9.3%	0.0%	0.8%	0.8%	**4.85**
An above or below elbow cast, or an above or below knee cast, for the purpose of nonoperative management of upper and lower extremity fractures	**88.4%**	8.5%	1.6%	0.8%	0.8%	**4.83**
Common adult fractures	**82.4%**	16.0%	0.0%	1.5%	0.0%	**4.79**
Joint dislocations	**82.3%**	15.4%	0.0%	2.3%	0.0%	**4.78**
ORIF of the ankle (bimalleolar/bimalleolar equivalent, trimalleolar/trimalleolar equivalent)	**73.0%**	24.6%	0.8%	1.6%	0.0%	**4.69**
Soft-tissue injuries	**73.6%**	24.0%	0.0%	2.3%	0.0%	**4.69**
CRIF of the femoral neck	**72.2%**	24.6%	1.6%	0.8%	0.8%	**4.67**
Debridement of a Grade I, II, and IIIA open fracture of any bone or joint	**73.2%**	20.5%	4.7%	1.6%	0.0%	**4.65**
ORIF of the proximal femur (intertrochanteric and subtrochanteric fractures)	**69.3%**	25.2%	3.1%	1.6%	0.8%	**4.61**

Peritendon injections	**70.8%**	20.0%	5.4%	3.1%	0.8%	**4.57**
CRIF of the tibia and fibula (IM nailing)	**65.6%**	28.1%	3.9%	1.6%	0.8%	**4.56**
CRIF of the femoral shaft (IM nailing)	**65.6%**	25.8%	7.0%	0.8%	0.8%	**4.55**
ORIF of the patella	**61.6%**	31.2%	3.2%	3.2%	0.8%	**4.50**
ORIF of the radius/ulna shaft	**54.8%**	36.5%	4.8%	3.2%	0.8%	**4.41**
ORIF of olecranon fractures	48.0%	42.4%	6.4%	2.4%	0.8%	**4.34**
ORIF of the distal radius and ulna	43.9%	40.7%	11.4%	3.3%	0.8%	**4.24**
Multiple injuries	40.3%	48.1%	4.7%	7.0%	0.0%	**4.22**
Debridement of a Grade IIIB open fracture of any bone or joint	**55.5%**	25.0%	5.5%	13.3%	0.8%	**4.21**
External fixation for fractures or dislocations of the lower extremity including spanning of the knee and/or ankle	48.8%	29.9%	11.8%	8.7%	0.8%	**4.17**
ORIF of the proximal tibia (unicondylar tibial plateau fracture)	39.0%	40.7%	15.4%	4.1%	0.8%	**4.13**
External fixation device for fractures or dislocations of the upper extremity including the wrist	36.2%	38.6%	16.5%	7.9%	0.8%	**4.02**
ORIF of the humeral shaft, either plate or nail fixation	31.1%	43.4%	18.0%	5.7%	1.6%	**3.97**
ORIF of the distal femur (bicondylar intra-articular supracondylar fractures)	33.1%	39.5%	16.1%	9.7%	1.6%	**3.93**
ORIF of two-part fractures of the proximal humerus	24.4%	48.0%	19.7%	6.3%	1.6%	**3.87**
ORIF of the clavicle	19.5%	38.3%	25.0%	10.9%	6.3%	**3.54**
ORIF of the metacarpal bones	17.2%	35.2%	24.2%	21.9%	1.6%	3.45
ORIF of the proximal tibia (bicondylar tibial plateau fracture)	22.2%	26.2%	26.2%	23.8%	1.6%	3.44
ORIF of the proximal radius	18.4%	30.4%	24.8%	24.8%	1.6%	3.39

ORIF of a transolecranon fracture/dislocation of the elbow	16.3%	35.8%	18.7%	26.8%	2.4%	3.37
ORIF of a periprosthetic fracture of the knee	10.4%	32.8%	31.2%	21.6%	4.0%	3.24
ORIF of a periprosthetic fracture of the hip	10.2%	31.5%	29.9%	22.8%	5.5%	3.18
ORIF of the distal humerus including intra-articular fractures	10.4%	32.8%	20.8%	32.0%	4.0%	3.14
ORIF of a pilon fracture	8.7%	27.6%	25.2%	36.2%	2.4%	3.04
Open repair of a dislocated elbow	11.0%	22.8%	29.1%	31.5%	5.5%	3.02
ORIF of three- and four-part fractures of the proximal humerus including fracture dislocations	8.9%	22.8%	28.5%	35.0%	4.9%	2.96
ORIF of the tarsal bones (calcaneus, talus)	6.3%	17.3%	26.0%	45.7%	4.7%	2.75
ORIF of a periprosthetic fracture of the shoulder	4.8%	21.4%	29.4%	32.5%	11.9%	2.75
ORIF of the carpal bones (scaphoid)	6.3%	10.3%	20.6%	55.6%	7.1%	2.53
ORIF of the pelvic symphysis	4.8%	7.3%	17.7%	57.3%	12.9%	2.34
ORIF of a periprosthetic fracture of the elbow	3.2%	12.0%	16.8%	51.2%	16.8%	2.34
ORIF of posterior wall acetabular fractures	4.0%	7.1%	15.9%	55.6%	17.5%	2.25
ORIF of the scapula	3.1%	7.0%	10.9%	60.2%	18.8%	2.16
ORIF of acetabular fractures excluding posterior wall fractures	0.8%	4.0%	5.6%	70.4%	19.2%	1.97
ORIF of posterior pelvic ring fractures	1.6%	2.4%	7.9%	66.9%	21.3%	1.96

Table 3: Sports Medicine and Sports Surgery

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Diagnostic arthroscopy of the knee	**59.5%**	31.7%	4.8%	2.4%	1.6%	**4.45**
Arthroscopic meniscectomy and debridement of the knee	**58.3%**	32.3%	6.3%	1.6%	1.6%	**4.44**
Open repair of shoulder rotator cuff tear	26.8%	48.8%	13.4%	10.2%	0.8%	**3.91**
Diagnostic arthroscopy of the shoulder	26.0%	41.5%	21.1%	7.3%	4.1%	**3.78**
Arthroscopic meniscal repair	26.0%	36.2%	21.3%	15.0%	1.6%	**3.70**
Open repair of a shoulder dislocation	19.8%	36.5%	17.5%	23.8%	2.4%	3.48
Arthroscopic ACL reconstruction	15.7%	30.7%	31.5%	18.9%	3.1%	3.37
Arthroscopic repair of the shoulder including a rotator cuff tear and/or SLAP lesions	10.2%	14.2%	35.4%	33.9%	6.3%	2.88
Open repair of collateral ligaments of the knee	7.9%	21.4%	30.2%	31.7%	8.7%	2.88
Diagnostic arthroscopy of the ankle	3.9%	19.7%	33.9%	32.3%	10.2%	2.75
Arthroscopic repair of the shoulder for dislocation	7.2%	15.2%	29.6%	40.8%	7.2%	2.74
Forefoot such as the MTP of the great toe, IP joints (arthrodesis)	6.4%	12.8%	39.2%	28.0%	13.6%	2.70
Ankle arthrodesis	4.8%	15.3%	29.0%	35.5%	15.3%	2.59
Arthrodesis of hindfoot such as a subtalar fusion	4.0%	10.5%	31.5%	37.1%	16.9%	2.48
Midfoot as a triple arthrodesis	3.2%	9.6%	30.4%	40.8%	16.0%	2.43
Diagnostic arthroscopy of the elbow	3.2%	8.8%	29.6%	42.4%	16.0%	2.41
Malunion of the adult humerus, femur, or tibia	0.8%	11.3%	30.6%	38.7%	18.5%	2.37
Adult proximal and distal tibia osteotomy	2.4%	7.3%	35.5%	33.9%	21.0%	2.36

Arthroscopic reconstruction of more than two ligaments of the knee	1.6%	10.4%	20.0%	56.0%	12.0%	2.34
Adult distal radius and ulna osteotomy	3.2%	4.0%	26.4%	43.2%	23.2%	2.21
Adult radius and ulna osteotomy	3.2%	5.6%	21.6%	46.4%	23.2%	2.19
Knee arthrodesis	1.6%	8.2%	19.7%	47.5%	23.0%	2.18
Posterior cruciate ligament reconstruction	1.6%	6.3%	11.0%	63.0%	18.1%	2.10
Diagnostic arthroscopy of the wrist	1.6%	3.2%	13.5%	61.9%	19.8%	2.05
Adult proximal and distal femur osteotomy	0.8%	3.2%	24.0%	42.4%	29.6%	2.03
Diagnostic arthroscopy of the hip	0.8%	2.4%	9.5%	59.5%	27.8%	1.89
Adult pelvis osteotomy	0.0%	0.0%	0.8%	52.0%	47.2%	1.54

Table 4: Pediatrics

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Closed reduction of the distal radius and ulna with cast immobilization	**62.8%**	31.4%	2.5%	3.3%	0.0%	**4.54**
Closed reduction of the radial shaft and/or ulna shaft with cast immobilization	**58.3%**	36.7%	2.5%	2.5%	0.0%	**4.51**
Non-accidental trauma	**55.0%**	35.0%	5.0%	5.0%	0.0%	**4.40**
Compartment releases of the upper and lower extremity	**56.6%**	23.8%	5.7%	12.3%	1.6%	**4.21**
A limp	43.0%	38.8%	13.2%	5.0%	0.0%	**4.20**
Compartment releases of the upper and lower extremity	**54.5%**	24.0%	6.6%	13.2%	1.7%	**4.17**
Common fractures involving the wrist or forearm, elbow, and femoral neck or shaft; and to understand the	46.7%	32.0%	11.5%	9.8%	0.0%	**4.16**

complications associated with physical injuries, a slipped capital femoral epiphyseal injury, and osteonecrosis						
Musculoskeletal infections	41.8%	39.3%	11.5%	7.4%	0.0%	**4.16**
Open reduction of the radial shaft and/or ulna shaft with internal fixation	39.7%	31.4%	16.5%	11.6%	0.8%	**3.98**
Closed reduction and percutaneous pinning of fractures of the elbow including supracondylar, medial, or lateral condylar fractures	27.0%	40.2%	19.7%	12.3%	0.8%	**3.80**
Femoral shaft fracture with traction or internal fixation	27.9%	32.0%	16.4%	23.8%	0.0%	**3.64**
Displaced epiphyseal plate injury of the lower extremity excluding the distal tibial epiphysis	23.6%	37.4%	11.4%	26.8%	0.8%	**3.56**
Tillaux fracture	21.3%	38.5%	13.9%	25.4%	0.8%	**3.54**
Slipped capital femoral epiphysis	25.2%	27.6%	22.0%	20.3%	4.9%	3.48
Triplane fracture	21.3%	34.4%	14.8%	28.7%	0.8%	3.47
Hip conditions such as developmental dysplasia, slipped capital femoral epiphysis, and osteonecrosis	22.1%	32.0%	16.4%	25.4%	4.1%	3.43
Multiple injuries	22.3%	35.5%	11.6%	21.5%	9.1%	3.40
Bone biopsy	18.3%	31.7%	16.7%	28.3%	5.0%	3.30
Intertrochanteric or femoral neck fracture with traction or internal fixation	22.3%	22.3%	16.5%	37.2%	1.7%	3.26
Soft-tissue biopsy	16.4%	31.1%	18.9%	27.0%	6.6%	3.24
Diagnosing a congenital or neurological disorder such as club foot or cerebral palsy, and counseling the family	15.4%	27.6%	15.4%	33.3%	8.1%	3.09

Principles and use of the Pavlik harness for hip dysplasia	12.4%	27.3%	20.7%	29.8%	9.9%	3.02
Pediatric trauma, specifically the ability to make an assessment and knowledge of life support protocol	21.3%	18.9%	12.3%	32.8%	14.8%	2.99
Resection of a benign bone tumor and manage a bone defect	5.8%	25.6%	24.8%	34.7%	9.1%	2.84
Reconstructive osteotomies	0.8%	2.4%	13.8%	60.2%	22.8%	1.98

Table 5: Spine

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Mechanical neck and back pain relating to non-specific low back pain, spondylolisthesis, spondylolysis, or lumbago	44.7%	47.7%	1.5%	4.5%	1.5%	**4.30**
Spinal cord or root entrapment, e.g., herniated lumbar disc, myelopathy, or radiculopathy of the spine	40.5%	43.5%	6.1%	8.4%	1.5%	**4.13**
Vertebral fractures of traumatic or osteoporotic origin with and without acute spinal cord injury	29.0%	46.6%	9.2%	13.7%	1.5%	**3.88**
Inflammatory back conditions such as ankylosing spondylitis	15.3%	44.3%	19.8%	17.6%	3.1%	**3.51**
A spinal deformity such as scoliosis	15.9%	35.6%	20.5%	24.2%	3.8%	3.36
Destructive lesions of the spine presenting with back pain which may be of infectious or tumor origin such as tuberculosis, metastasis, and/or malignancy	20.6%	31.3%	13.7%	30.5%	3.8%	3.34

Discectomy of the lumbar spine	1.6%	9.5%	24.6%	33.3%	31.0%	2.17
Posterior decompression of the lumbar spine	0.8%	7.3%	17.7%	40.3%	33.9%	2.01
Discectomy of the cervical spine	0.0%	1.6%	12.7%	45.2%	40.5%	1.75
Lumbar spine arthrodesis	0.0%	0.8%	10.3%	43.7%	45.2%	1.67
Posterior decompression of the thoracic spine	0.0%	2.4%	3.2%	52.4%	42.1%	1.66
Posterior decompression of the cervical spine	0.0%	0.8%	4.8%	51.6%	42.9%	1.63
Discectomy of the thoracic spine	0.0%	0.8%	4.0%	52.4%	42.9%	1.63
Cervical spine arthrodesis	0.0%	0.0%	7.3%	45.2%	47.6%	1.60

Table 6: Foot and Ankle

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Pathological fracture	42.2%	38.3%	8.6%	10.9%	0.0%	**4.12**
Delayed union and non-union	37.7%	38.5%	11.5%	11.5%	0.8%	**4.01**
Fracture secondary to a gunshot wound	21.1%	47.7%	16.4%	14.1%	0.8%	**3.74**
Malunion	21.9%	25.8%	23.4%	26.6%	2.3%	3.38
Tendon repair in the area of the foot or ankle	7.1%	25.2%	33.9%	29.1%	4.7%	3.01
Non-union with a large bony defect	15.4%	20.0%	11.5%	49.2%	3.8%	2.94
Forefoot such as the MTP of the great toe, IP joints (arthrodesis)	6.4%	12.8%	39.2%	28.0%	13.6%	2.70
Ankle arthrodesis	4.8%	15.3%	29.0%	35.5%	15.3%	2.59
Hindfoot such as a subtalar fusion	4.0%	10.5%	31.5%	37.1%	16.9%	2.48
Midfoot as a triple arthrodesis	3.2%	9.6%	30.4%	40.8%	16.0%	2.43
Osteotomy of lesser bones of the adult foot	2.4%	9.8%	22.0%	38.2%	27.6%	2.21
Knee arthrodesis	1.6%	8.2%	19.7%	47.5%	23.0%	2.18
Adult calcaneus osteotomy	1.6%	1.6%	9.6%	55.2%	32.0%	1.86

Table 7: Hand

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Carpel tunnel release at the wrist	**52.4%**	36.5%	7.1%	3.2%	0.8%	**4.37**
Hand or carpus amputation	5.7%	34.4%	19.7%	30.3%	9.8%	2.96
Open repair of the distal radius and ulnar joint	7.9%	23.8%	23.0%	39.7%	5.6%	2.89
Open repair of a dislocated MP/IP joint of the hand	12.8%	17.6%	18.4%	40.8%	10.4%	2.82
Tendon repair in the area of the wrist or hand	4.8%	16.7%	22.2%	47.6%	8.7%	2.61
Carpal metacarpal (CMC) reconstruction	2.4%	3.1%	16.5%	63.0%	15.0%	2.15
Reconstruction of collateral ligaments and/or volar plate of the MP/IP joints of the hand	2.4%	1.6%	7.1%	75.6%	13.4%	2.04
Radical fasciectomy for Dupuytren's contracture	0.0%	5.6%	10.3%	65.9%	18.3%	2.03
Intercarpal bones (intercarpal fusion) (arthrodesis)	1.6%	3.2%	11.3%	58.1%	25.8%	1.97
Shoulder, elbow, or wrist arthrodesis	1.6%	4.0%	14.3%	46.8%	33.3%	1.94

Table 8: Clinical Assessment and Diagnosis

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Order and understand the interpretation of radiographs	**94.0%**	4.5%	0.0%	1.5%	0.0%	**4.91**
Identify normality and abnormality by a comprehensive physical examination of the musculoskeletal system, which includes assessment of pain, tenderness, swelling, dislocation, displacement, deformity, muscle wasting, weakness, abnormal movement, and functional impairment	**88.9%**	8.9%	0.7%	1.5%	0.0%	**4.85**
Take a relevant history in terms of impairment of function, limitation of activities, and restriction of participation for major conditions of bone, joints, and connective nerve and muscle tissue as they relate to both acute and chronic injury or other disease processes	**85.9%**	9.6%	1.5%	1.5%	1.5%	**4.77**
Order and understand the interpretation of synovial fluid analysis	**67.9%**	27.6%	3.0%	1.5%	0.0%	**4.62**
Order and understand the interpretation of basic blood tests such as hemoglobin, erythrocyte sedimentation rate, C-reactive protein, electrolytes, liver and renal function, and bone metabolism studies	**66.7%**	28.9%	3.0%	1.5%	0.0%	**4.61**

Order and understand the interpretation of computer tomography scans	**54.5%**	44.0%	0.0%	1.5%	0.0%	**4.51**
Order and understand the interpretation of magnetic resonance imaging (MRI)	**52.2%**	44.0%	2.2%	1.5%	0.0%	**4.47**
Order and understand the interpretation of bone scans	39.4%	47.7%	9.8%	1.5%	1.5%	**4.22**
Order and understand the interpretation of bone densitometry	15.0%	44.4%	34.6%	0.8%	5.3%	**3.63**
Order and understand the interpretation of electromyograms (EMGs) and nerve conduction studies	12.7%	33.6%	37.3%	10.4%	6.0%	3.37
Order and understand the interpretation of musculoskeletal ultrasound	10.4%	18.7%	44.8%	16.4%	9.7%	3.04

Table 9: Emergency Conditions

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Joint infection	**89.8%**	7.8%	0.0%	2.3%	0.0%	**4.85**
Compartment syndrome	**86.9%**	10.8%	0.0%	2.3%	0.0%	**4.82**
Open fractures	**84.2%**	12.8%	0.8%	2.3%	0.0%	**4.79**
Soft-tissue infection	**76.3%**	19.8%	1.5%	1.5%	0.8%	**4.69**
Fasciotomy for compartment syndrome of the lower extremity	**72.4%**	24.4%	0.8%	2.4%	0.0%	**4.67**
Bone infection	**70.5%**	25.0%	2.3%	2.3%	0.0%	**4.64**
Acute nerve or vascular compromise	**69.9%**	18.0%	2.3%	7.5%	2.3%	**4.46**
Fasciotomy for compartment syndrome of the upper extremity	**59.8%**	29.1%	3.9%	6.3%	0.8%	**4.41**
Cauda equina compression	45.0%	23.7%	2.3%	25.2%	3.8%	**3.81**

Table 10: Tumors

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Metastatic bone disease	35.7%	45.0%	10.9%	8.5%	0.0%	**4.08**
Osteoporosis	21.7%	45.7%	25.6%	3.1%	3.9%	**3.78**
Soft-tissue tumor	10.8%	36.2%	20.0%	30.8%	2.3%	3.22
Primary bone tumor	10.8%	38.5%	12.3%	34.6%	3.8%	3.18
Metabolic bone diseases including osteomalacia and Paget's disease	6.2%	31.5%	37.7%	15.4%	9.2%	3.10

Table 11: Communication, Education, and Research

COMPETENCY	Mandatory	Should be Competent	Helpful to Broaden Scope	Subspecialty	Unnecessary	Rank
Is it important to your practice to obtain ongoing continuing medical education (CME)?	**87.0%**	9.8%	2.4%	0.8%	0.0%	**4.83**
Is patient education an effective skill for communicating and teaching your patients?	**80.0%**	17.5%	2.5%	0.0%	0.0%	**4.78**
Is it important to your practice that you teach and communicate effectively with peers?	**71.1%**	24.8%	4.1%	0.0%	0.0%	**4.67**
Is it important for you to use skills provided in the literature for critical appraisals?	**62.3%**	30.3%	6.6%	0.8%	0.0%	**4.54**
Is it important to your practice that you teach and communicate effectively with non-peer groups?	**60.2%**	34.1%	4.1%	0.0%	1.6%	**4.51**

Appendix 16

Conference Call Minutes, September 9, 2014

General Orthopaedic Surgery Task Force
Conference Call
Date: September 9, 2014
Time: 09:00 Eastern Daylight

Attendance: D Archibald, J Barber, E Christian, R D'Ascoli, S Hecht, S Hurwitz, J Kellam, A McLaren, T Peabody

Excused: S Southworth, V Wadey

Minutes

Meeting called to order at 09:01

It was decided to discuss the competencies that were under question rather than determine if 50% mandatory would be used as the cutoff for the determination of these competencies.

Osteotomy: It was decided that a general orthopaedic surgeon must understand the principles of deformity assessment and management including the performance of uncomplicated corrective osteotomies.

Upper extremity amputations: A general orthopaedic surgeon must be competent in performing traumatic upper extremity amputations.

Total shoulder arthroplasty: It was agreed that the general orthopaedic surgeon is not required to do total shoulder arthroplasty as a mandatory competence. A shoulder hemiarthroplasty for a proximal humeral fracture remains a mandatory competence.

Periprosthetic fractures: Agreement was reached that this is not a competence for the general orthopaedic surgeon. It was felt that this is a subspecialty surgeon competence.

Total joint arthroplasty (hip and knee): Although all residents are competent in performing total hip and knee arthroplasty at the conclusion of their training, it was felt that in a general orthopaedic practice the maintenance of this competency is dependent on practice pattern, location, and surgeon interest. It was also agreed that a general orthopaedic surgeon

wishing to do total hip and knee arthroplasty must strive to meet the determined case volume to remain competent.

There was no disagreement with the decision to state the general orthopaedic surgeon must be competent in osteoporosis counseling of patients.

Dr. McLaren expressed interest in how we could justify a 50% cutoff level to make a competency mandatory. The GOCTF felt that this was a starting point and ongoing reassessment will be required over the next years to determine if this level is indicative of what is done in a general orthopaedic practice.

Dr. Hurwitz and Dr. Barber suggested that the GOCTF needed to consider if another survey was needed and if so what would it entail. Dr. Archibald stated that once the competencies had been finally determined, then they could be sent out to either a group of general orthopaedic surgeon and or the prior group to see if these matched what is done in practice.

It was decided that the following needed to be done:

1. A new survey of general orthopaedic surgeon to see if the proposed competencies are reasonable.
2. A yearly summary from the ABOS data bank to determine what cases are being done by general orthopaedic candidates for both Part 2 and recertification and correlate to the list of competencies.
3. The GOCTF will meet yearly to assess these results and modify the competencies.
4. Based upon the new survey results and review of ABOS case data, further surveys may be needed to obtain a consensus on the competencies.

The call was adjourned at 9:45 PM

Appendix 17

Second Delphi Survey: Controversial Competencies

January to February 2015 using SurveyMonkey

As these were questionable competencies based on the first survey (either achieving 50% or a rank of 3.5), it was agreed that a simple yes/no answer would be used and a cutoff of 60% or greater would be required to include as a core competency. The higher level of acceptance was felt reasonable, as these were competencies that were debatable so that higher level of acceptability was felt necessary to ensure that they were core competencies.

The results are as follows:

Total responses ranked by percentage yes

Competency	% Agreement	Number
Manage an intertrochanteric fracture with internal fixation	97.26	142
Assess a malunion and refer	96.58	141
Diagnose osteoporosis	93.84	137
Provide culturally and gender competent care	92.47	135
Assess and refer destructive lesions of the spine presenting with back pain, which may be infectious or of tumor origin such as tuberculosis, metastasis, and/or malignancy	93.10	133
Perform ORIF of the metacarpal bones	88.36	129
Know how to use bone stimulation technology	85.62	125
Manage a displaced femoral neck fracture with ORIF	84.93	124
Perform a synovectomy of the knee	83.50	122
Understand the indications for and the interpretation of electromyograms (EMGs) and nerve conduction studies	79.45	116
Perform an uncomplicated simple tendon procedure of the foot	76.03	111
Perform a bone biopsy	74.66	109
Perform ORIF of a transolecranon fracture/dislocation of the elbow	73.29	107
Remove a total knee prosthesis for infection and insert an antibiotic spacer	69.18	101
Perform ORIF of the proximal radius	66.44	97
Perform ORIF of a triplane fracture	63.70	93
Give professional expert medical legal testimony	63.70	93
Competent to use the various complementary and/or alternative forms of medical therapies available for the management of musculoskeletal injuries or disorders	63.01	92
Assess and institute acute resuscitative care for a patient with multiple injuries and fractures	62.33	91
Operatively manage a slipped capital femoral epiphysis	59.59	87
Operatively correct a uniplanar malunion	59.59	87
Perform forefoot surgery, i.e., fusion MTP of the great toe, IP joints	59.59	87
Perform a hemiarthroplasty of the shoulder	58.90	86
Perform an open repair of a shoulder dislocation	58.90	86
Perform ORIF of the distal humerus including intra-articular fractures	56.16	82
Perform ORIF of a bicondylar tibial plateau fracture	56.16	82
Perform a disability evaluation and/or impairment rating	53.42	78
Perform an open repair of a dislocated elbow	51.97	75
Perform ORIF of a periprosthetic knee fracture	46.48	68
Perform ORIF of a periprosthetic hip fracture	45.89	67
Perform DDH nonoperative treatment	43.15	63

Perform an ankle fusion	43.15	63
Prescribe hypouricemic drugs commonly used in the management of musculoskeletal conditions	41.78	61
Perform subtalar fusion	32.19	47
Perform a primary unicompartmental arthroplasty of the knee	29.45	43
Medically treat osteoporosis	28.08	41
Perform a triple arthrodesis	27.40	40
Assess and manage metabolic bone diseases including osteomalacia and Paget's disease	20.55	30
Use antidepressants in pain management associated with musculoskeletal conditions	18.49	27
Perform a primary total shoulder arthroplasty	18.49	27

The competencies above the 60% cutoff:

Competency	% Agreement	Number
Manage an intertrochanteric fracture with internal fixation	97.26	142
Assess a malunion and refer	96.58	141
Diagnose osteoporosis	93.84	137
Provide culturally and gender competent care	92.47	135
Assess and refer destructive lesions of the spine presenting with back pain, which may be infectious or of tumor origin such as tuberculosis, metastasis, and/or malignancy	91.10	133
Perform ORIF of the metacarpal bones	88.36	129
Know how to use bone stimulation technology	85.62	125
Manage a displaced femoral neck fracture with ORIF	84.93	124
Perform a synovectomy of the knee	83.50	122
Understand the indications for and the interpretation of electromyograms (EMGs) and nerve conduction studies	79.45	116
Perform an uncomplicated simple tendon procedure of the foot	76.03	111
Perform a bone biopsy	74.66	109
Perform ORIF of a transolecranon fracture/dislocation of the elbow	73.29	107
Remove a total knee prosthesis for infection and insert an antibiotic spacer	69.18	101
Perform ORIF of the proximal radius	66.44	97
Perform ORIF of a triplane fracture	63.70	93
Give professional expert medical legal testimony	63.70	93
Competent to use the various complementary and/or alternative forms of medical therapies available for the management of musculoskeletal injuries or disorders	63.01	92
Assess and institute acute resuscitative care for a patient with multiple injuries and fractures	62.33	91

The competencies below 60%:

Competency	% Agreement	Number
Operatively manage a slipped capital femoral epiphysis	59.59	87
Operatively correct a uniplanar malunion	59.59	87
Perform forefoot surgery, i.e., fusion MTP of the great toe, IP joints	59.59	87
Perform a hemiarthroplasty of the shoulder	58.90	86
Perform an open repair of a shoulder dislocation	58.90	86
Perform ORIF of the distal humerus including intra-articular fractures	56.16	82
Perform ORIF of a bicondylar tibial plateau fracture	56.16	82
Perform a disability evaluation and/or impairment rating	53.42	78
Perform an open repair of a dislocated elbow	51.97	75
Perform ORIF of a periprosthetic knee fracture	46.48	68
Perform ORIF of a periprosthetic hip fracture	45.89	67
Perform DDH nonoperative treatment	43.15	63
Perform an ankle fusion	43.15	63
Prescribe hypouricemic drugs commonly used in the management of musculoskeletal conditions	41.78	61
Perform subtalar fusion	32.19	47
Perform a primary unicompartmental arthroplasty of the knee	29.45	43
Medically treat osteoporosis	28.08	41
Perform a triple arthrodesis	27.40	40
Assess and manage metabolic bone diseases including osteomalacia and Paget's disease	20.55	30
Use antidepressants in pain management associated with musculoskeletal conditions	18.49	27
Perform a primary total shoulder arthroplasty	18.49	27

The GOCTF reviewed the competencies in both groups at their September 21, 2015, meeting. The competencies that fell below the 60% cutoff were felt be non-core competencies. As to the ones that achieved 60% or greater, the GOCTF felt that several might pose an issue to be considered as a core competency. The management of a displaced femoral neck fracture by open reduction is a competency that was felt not to be core. The core competency would be the recognition of the need for an open reduction and then transfer to a surgeon who could perform this operation. It was felt that this may have been interpreted as meaning a CRIF of a displaced femoral neck fracture in the elderly as it is common terminology to call this an "open reduction." If the surgeon is comfortable performing this competency, he or she may proceed. Similar concerns about operative treatment of a triplane fracture and a transolecranon fracture dislocation were expressed. These two competencies were not considered core but it was agreed that the recognition and transfer to a qualified surgeon would be a core competency.

Appendix 18

General Orthopaedic Competency Task Force Meeting, September 21, 2015

Minutes

The first purpose of this meeting was to review the second Delphi survey and finalize the questionable competencies based on the survey results and GOCTF discussion. The results of this are reported in Appendix 17.

The second purpose was to review the complete document and ensure that the results were in line with what GOCTF considered as acceptable core competencies for the practice of orthopaedic surgery. The GOCTF decided that its function was to define the core competencies of orthopaedic surgery that would be required of any surgeon practicing orthopaedic surgery. These core competencies would ensure that any orthopaedic patient will have available to him or her a surgeon who has the core competencies to provide safe and responsible care.

Review of the competencies resulted in a redefinition of management competencies to ensure that the core competencies were well understood and that these did not limit a surgeon from performing more extensive or non-core surgery if appropriately trained and having the volume. This should be well defined in the introduction. The old Management 1 category was eliminated and rolled into Management 2, which is a new category (original M-3) to read "The general orthopaedic surgeon must be competent to commence initial or emergency care and ***may*** provide definitive care based on injury acuteness." Management 1 is now competencies that are expected to be completely handled by an orthopaedic surgeon. Management 2 allows for initial assessment and then referral or ongoing management based on practice, acuteness of the injury and situation and education. "The orthopaedist must be competent to commence initial ***assessment*** for emergency care" will be added to the Management 2 definition.

The evaluation section of the first report was agreed to be eliminated for each area of practice. These competencies are standard to all of orthopaedic surgeons so are defined as basic core competencies and listed at the beginning of the Competencies section of the article and will be given in detail in Appendix 13 and will be understood as being relevant to all other sections.

Another issue discussed was the need for an orthopaedic curriculum beyond residency and fellowship training for those in practice to develop and/or maintain their core skills relevant to certification. This may be a new way to promote meaningful CME through lifelong learning and development in these core skills. The concept of surgical coaching was suggested as method to achieve these goals.

The question if surgical case volumes should determine core competencies was discussed. It was felt that once a core competency was learned in residency then it should be easily remembered and local volumes should determine if it is expected to be performed and not mandated. The core competencies would provide benchmarks for an orthopaedic surgeon returning to practice after being disabled, etc.

The sports medicine section had been renamed as arthroscopy, but, following peer review, the section was renamed again as sports medicine and sports surgery. The nonoperative components were moved to their appropriate sections. The pediatric section was revised.

Under professional competencies, it was felt important that surgeons needed to participate meaningfully and with an open mind to that the section requiring this was revised to state "work to develop meaningful regulatory measures." Also added was a note that the surgeon must follow the ethics and professional code as defined in the AAOS.

Dr. Swiontkowski, the editor of JBJS, made the following suggestions for the paper to be submitted to the journal:

Design paper for audience
Use a flowchart-type style
For JBJS must be only 3,000 words with 2 to 4 tables

The plan will be to submit to JBJS an article covering the concept, methodology, and brief synopsis of the results and this complete, slightly modified report.