Supplemental Guide:
Orthopaedic Sports Medicine

ACGME

April 2022

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Orthopaedic Sports Medicine Milestones. This is not designed to indicate any specific requirements for each level, but to provide insight into the thinking of the Milestone Work Group.

Included in this document is the intent of each Milestone and examples of what a Clinical Competency Committee (CCC) might expect to be observed/assessed at each level. Also included are suggested assessment models and tools for each subcompetency, references, and other useful information.

Review this guide with the CCC and faculty members. As the program develops a shared mental model of the Milestones, consider creating an individualized guide (Supplemental Guide Template available) with institution/program-specific examples, assessment tools used by the program, and curricular components, including rotation mapping.

Additional tools and references, including the Milestones Guidebook, Clinical Competency Committee Guidebook, and Milestones Guidebook for Residents and Fellows, are available on the Resources page of the Milestones section of the ACGME website.

Some milestone descriptions include statements about performing independently. It is important to use this guide in conjunction with the ACGME specialty-specific Program Requirements. Specific language has been included that is best defined through the Program Requirements.

Levels of Supervision

To promote oversight of resident supervision while providing for graded authority and responsibility, the program must use the following classification of supervision:

Direct Supervision: The supervising physician is physically present with the resident and patient.

Indirect Supervision:

with Direct Supervision immediately available: The supervising physician is physically within the hospital or other site of patient care and is immediately available to provide Direct Supervision.

with Direct Supervision available: the supervising physician is not physically present within the hospital or other site of patient care but is immediately available by phone/email/text/etc. and is available to provide Direct Supervision.

Guidance: The supervising physician is available to answer questions or provide in-the-moment surgical advice.

Oversight: the supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered.

Patient Care 1: History and Physical Examination, Imaging, Interpretation, and Diagnosis **Overall Intent:** To accurately assess the progression of a learners' skills as it pertains to patient history taking, physical examination, image interpretation and differential diagnosis generation	
Milestones	**Examples**
Level 1 *Obtains appropriate medical history and performs basic orthopaedic examination, with guidance*	● Asks pertinent questions regarding sensations that were experienced in the injured joint (pop, snap, etc.) ● Asks questions regarding joint swelling onset
Identifies diagnostic testing for common orthopaedic sports conditions	● Identifies contact versus non-contact sport-related knee injuries ● Recognizes at-risk positions for shoulder instability ● Identifies x-ray and magnetic resonance imaging (MRI) as common diagnostic testing
Develops a basic differential diagnosis pertinent to common orthopaedic conditions, with guidance	● Develops appropriate differential diagnosis based on area of injury
Level 2 *Obtains history of sports-related conditions or injuries and performs orthopaedic examination for common sports conditions*	● Asks appropriate history questions for a patient with a dislocated shoulder
Interprets diagnostic testing for orthopaedic sports conditions, with guidance	● Orders appropriate x-ray views to assess joint injury (shoulder instability, ankle instability, etc.)
Develops a basic differential diagnosis pertinent to orthopaedic sports conditions, with guidance	● Develops appropriate differential diagnosis based on area of injury and injuries commonly seen in the specific sport/population
Level 3 *Obtains history of sports-related conditions or injuries and performs orthopaedic examination and recognizes complex or high-risk sports conditions*	● Asks appropriate history questions for chronic and overuse athletic-related injuries (fifth metatarsal stress fracture, exertional compartment syndrome, etc.)
Orders and interprets diagnostic testing for complex orthopaedic sports conditions, with guidance	● Interprets the x-ray and MRI findings in tandem to create a diagnosis
Develops a comprehensive differential diagnosis based on history and physical examination findings, with guidance	● Interprets physical exam and specialized imaging to create appropriate treatment plan for sport-related injuries

Level 4 *Independently obtains history of sports-related conditions or injuries and consistently performs complex examinations of sports conditions* *Independently interprets diagnostic testing for complex orthopaedic sports conditions* *Independently develops a comprehensive differential diagnosis based on history and physical examination findings*	● Recognizes the subtleties between patellar subluxation and medial collateral ligament (MCL) sprain ● Identifies osteochondral injury on MRI scan ● Develops timing framework to use advanced imaging after a “simple” ankle sprain ● Finalizes treatment plan based on physical exam and specialized imaging
Level 5 *Develops and publishes on a new physical examination maneuver* *Develops novel imaging techniques for sports medicine*	● Creates population health recommendations based on injury pattern (throwing injuries in the adolescent population, etc.) ● Recognizes injury incidence and makes recommendations to mitigate risk
Assessment Models or Tools	● Direct observation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● American College of Radiology. Case in Point. http://3s.acr.org/cip/ShowArchiveCases.aspx?Status=Unknown&CName=MusculosketalNote: Requires a username and password. ● Fishman, EK. CTisus. http://www.ctisus.com/tf/musculo.html. ● Radiological Society of North America (RSNA). RSNA Journals. https://pubs.rsna.org.

Patient Care 2: Non-Operative Management **Overall Intent:** To provide non-surgical treatment plans to appropriately treat musculoskeletal injuries	
Milestones	**Examples**
Level 1 *Generates a basic treatment plan for common orthopaedic sports conditions, with direct supervision* *Manages patients with basic orthopaedic sports conditions (e.g., knee injection, bracing, physical therapy prescription), with direct supervision*	● Develops a treatment plan for simple sprains and muscle contusions with direct attending supervision ● Identifies devices or durable medical equipment to assist in healing and understands the role of physical therapy and athletic training
Level 2 *Generates a basic treatment plan for common orthopaedic sports conditions, with indirect supervision* *Manages patients with basic orthopaedic sports conditions, with indirect supervision*	● Develops a treatment plan for stress reaction/fracture to include bone stimulation and Vitamin D, with indirect supervision ● Manages athletic training room with athletic trainer and consults attending when appropriate ● Manages Grade 1 knee MCL tear or Grade 1 ankle sprain
Level 3 *Generates and modifies a treatment plan for complex orthopaedic sports conditions, with guidance* *Independently manages patients and adapts a management plan for basic orthopaedic sports conditions*	● Develops a treatment plan for an isolated Grade 2-3 MCL tear ● Establishes a treatment plan for in-season injuries (e.g., shoulder instability) ● Manages injuries based on injury and type of sport
Level 4 *Independently generates and modifies individualized treatment plans* *Independently manages patients and adapts management plan for complex orthopaedic sports conditions*	● Develops an individualized return-to-running program for a patient with a diagnosed stress fracture ● Develops a treatment plan for shoulder instability with bone loss or chronic patellar instability
Level 5 *Develops and/or disseminates a novel treatment protocol*	● Designs a new brace ● Writes a book chapter on non-operative management of an isolated Grade 3 MCL tear
Assessment Models or Tools	● Direct observation ● Multisource feedback
Curriculum Mapping	●

Notes or Resources	● Azar F. *Orthopaedic Knowledge Update: Sports Medicine 6*, Rosemont, Illinois: American Academy of Orthopaedic Surgeons and Wolters Kluwer; 2020. ● Andrews JR, Harrelson GL, Wilk KE. *Physical Rehabilitation of the Injured Athlete*. 4th ed. Amsterdam, Netherlands: Elsevier; 2012. ● Cleveland Clinic. Sideline Guideline App. https://my.clevelandclinic.org/mobile-apps/sideline-guidelines-app.

Patient Care 3: Arthroscopic Skills **Overall Intent:** To assess the safe, effective, and appropriate skill progression of learners with arthroscopic surgical management of the knee, shoulder, hip, ankle, and elbow	
Milestones	**Examples**
Level 1 *Develops a simple surgical plan, with indirect supervision* *Demonstrates basic surgical skills (e.g., wound closure) and assists with procedures* *Identifies and reports simple complications*	● Develops plan for degenerative meniscus tear ● Performs diagnostic arthroscopy of common joints (e.g., knee, shoulder) with direct supervision ● Identifies post-surgical bleeding and stiffness
Level 2 *Develops a surgical plan that includes identification of potential challenges and technical complexities, with guidance* *Establishes portals and access and performs diagnostic knee and shoulder arthroscopy, with indirect supervision* *Identifies and manages simple complications, with guidance*	● Develops a surgical plan for meniscectomy ● Gains access and navigates the joint ● Performs complete diagnostic arthroscopy of the knee with meniscectomy and of the shoulder with debridement ● Recognizes need for ancillary portals ● Recognizes common complications of surgery
Level 3 *Develops a surgical plan for complex procedures, including contingencies for complications, with guidance* *Performs critical steps of knee and shoulder procedures, with guidance; establishes portals and access, and performs hip, elbow, and arthroscopy, with indirect supervision* *Identifies and manages complex complications, with guidance*	● Performs most of the operative steps for reconstructive procedures (e.g., anterior cruciate ligament (ACL) reconstruction, anterior shoulder stabilization, microfracture of articular cartilage in the knee, lateral ankle) ● Performs diagnostic arthroscopy and debridement techniques for the elbow, hip, and ankle ● Performs meniscus root repair ● Performs chondroplasty and discusses options for resurfacing ● Treats and manages post-operative complications of surgery
Level 4 *Independently develops a surgical plan for complex procedures, including contingencies for complications*	● Performs all steps for primary reconstruction of the knee, shoulder, and ankle (e.g., ACL and posterior cruciate ligament (PCL) reconstruction, anterior and posterior shoulder reconstruction, knee and ankle osteochondral transplantation)

Independently performs complex knee and shoulder procedures with skill and confidence *Independently develops a plan for managing complex complications*	● Performs common revision reconstruction for the ACL, anterior shoulder, and lateral ankle ● Performs surgical repair and reconstructive techniques for the elbow, hip, and ankle (osteochondritis dissecans lesions of the elbow and ankle, hip labral and femoroacetabular impingement treatment) ● Recognizes, corrects, and avoids potential intra-operative complications
Level 5 *Develops novel surgical techniques* *Contributes to a quality improvement initiative regarding addressing complications at the institution*	● Acts as a primary referral to treat complex revision reconstruction procedures (e.g., double bundle ACL, PCL, shoulder with bone loss) ● Acts as a primary referral for complex osteoarticular problems ● Contributes to a patient registry for risk factors for ACL re-rupture
Assessment Models or Tools	● Cadaver lab sessions ● Direct observation ● Multisource feedback ● Surgical simulators
Curriculum Mapping	●
Notes or Resources	● Arthroscopy Techniques https://www.arthroscopytechniques.org/ ● American Academy of Orthopaedic Surgeons (AAOS). Orthopaedic Video Theater. https://www.aaos.org/videos/. ● Koehler RJ, Amsdell S, Arendt EA, Bisson LJ, Braman JP, Butler A, Cosgarea AJ, Harner CD, Garrett WE, Olson T, Warme WJ, Nicandri GT. The Arthroscopic Surgical Skill Evaluation Tool (ASSET). *Am J Sports Med*. 2013 Jun;41(6):1229-37. doi: 10.1177/0363546513483535. Epub 2013 Apr 2. Erratum in: *Am J Sports Med*. 2013 Jul;41(7):NP38. Bramen, Jonathan P [corrected to Braman, Jonathan P]. PMID: 23548808; PMCID: PMC4134966. https://pubmed.ncbi.nlm.nih.gov/23548808/

Patient Care 4: Open Surgical Skills **Overall Intent:** To develop the knowledge and ability to perform open sports medicine surgical procedures independently	
Milestones	**Examples**
Level 1 *Develops a simple surgical plan, with indirect supervision*	● Develop a surgical plan for simple procedures like a quad or patella tendon repair
Demonstrates basic surgical skills (e.g., wound closure) and assists with procedures	● Demonstrate basic surgical skills like drilling transosseus tunnels, Krakow suturing, and techniques for suture passing
Identifies and reports simple complications	● Identifies and recognizes simple complications like patellar tendon repair failure
Level 2 *Develops a surgical plan that includes identification of potential challenges and technical complexities, with guidance*	● Develop a surgical plan for squad or patella tendon repair with identification of challenges including associated retinacular ruptures, benefits of anchors versus osseus tunnels, how to manage mid-substance ruptures; the surgical plan includes post-operative immobilization and recovery protocol
Performs surgical approach with indirect supervision	● Performs surgical approach to obtain necessary exposure, with indirect supervision
Identifies and manages simple complications with guidance	● Identifies and manages simple complications including wound issues and re-rupture
Level 3 *Develops a surgical plan for complex procedures, including contingencies for complications, with guidance*	● Develops a surgical plan for posterolateral corner reconstruction with attention to anatomy and associated complications
Performs critical steps of procedures with guidance	● Performs critical portions of procedure including identification of peroneal nerve, drilling fibular socket, identifying bony anatomy with supervision
Identifies and manages complex complications with guidance	● Identifies pre-operative peroneal nerve palsy, post-operative laxity, ACL re-rupture with guidance
Level 4 *Independently develops a surgical plan for complex procedures, including contingencies for complications*	● Develops a surgical plan for posterolateral corner reconstruction and can articulate various reconstruction techniques
Independently performs complex procedures with skill and confidence	● Independently performs posterolateral corner reconstruction with skill and confidence

Independently develops a plan for managing complex complications	● Develops plan for managing pre-operative peroneal nerve palsy, intra-operative graft cutout, and socket blowout
Level 5 *Develops novel surgical techniques* *Contributes to quality improvement initiative regarding complications at the institution*	● Develops novel surgical technique of graft fixation for posterolateral corner reconstruction ● Contributes to multi-ligamentous knee injury and knee dislocation quality improvement
Assessment Models or Tools	● Direct observation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● AAOS. Orthopaedic Video Theater: ○ https://www.aaos.org/videos/. ○ https://www.aaos.org/education/orthopaedic-video-theater/. ● Video Journal of Sports Medicine: https://journals.sagepub.com/home/vjs. ● American Orthopaedic Society for Sports Medicine (AOSSM). AOSSM Playbook. https://www.sportsmed.org/aossmimis/playbook.

Patient Care 5: Team Coverage and Athletic Care **Overall Intent:** To develop the skills to provide athletic team coverage and longitudinally manage athletic injuries and illnesses independently both in the training room and on the sideline	
Milestones	**Examples**
Level 1 *Observes team/event coverage* *Observes care for acute injuries and illness of the athlete on the sidelines*	● Attends track meet coverage with attending; surgeon and learner are available on sideline should an injury or illness occur ● Attending makes decision to hold athlete from participating due to recovery from mononucleosis; learner observes attending care for hamstring strain occurring during competition
Level 2 *Provides team/event coverage, with indirect supervision* *Treats and manages acute injuries and illness of the athlete on the sidelines with instructions for return-to-play, with indirect supervision*	● Provides coverage for sporting event with attending present but not directly supervising ● Independently evaluates and develops care plan including return-to-play for athletes with injuries and illnesses during sporting event; attending is available for guidance and to confirm plan of care
Level 3 *Provides team-based care with the athletic healthcare team for athletic teams and/or organizations, with guidance* *Treats and manages acute injuries and illness of the athlete on the sidelines with instructions for return-to-play, with guidance*	● Team-based assessment and management of acute injuries including concussion management, knee injury on the field with return-to-play guidance ● Provides coverage for sporting event (e.g., track meet, spring football game) without direct attending supervision
Level 4 *Independently provides team-based care with the athletic health care team for athletic teams and/or organizations* *Independently treats and manages acute injuries and illness of the athlete on the sidelines with instructions for return-to-play*	● Provides independent team coverage for high school or college football team including both athletic training room and sideline care ● Develops health care network for the team to identify solutions ● Manages proximal interphalangeal dislocation of the finger and determines return-to-play when possible ● Assesses ankle function after sprain and return-to-play when possible
Level 5 *Develops and/or disseminates novel treatments for sideline management*	● Publishes case series on pathology identified in preseason pre-participation physicals ● Implements preseason baseline testing program for fitness and concussion management
Assessment Models or Tools	● Athletic team coordination ● Direct observation ● Multisource feedback

Curriculum Mapping	●
Notes or Resources	● AOSSM. AOSSM Playbook: https://www.sportsmed.org/aossmimis/playbook ● AOSSM. AOSSM Consensus Statements: https://www.sportsmed.org/aossmimis/Members/Publications/Consensus_Statements/Members/Publications/Consensus_Statements.aspx?hkey=6c57a90a-c82b-4b2d-9d08-6951cfc795ff. ○ See “Team Physician Consensus Statement (2013)”

Medical Knowledge 1: Orthopaedic Clinical Decision Making **Overall Intent:** To analyze and synthesize medical knowledge to apply critical reasoning to clinical decision making, appropriately prioritizing diagnoses and using diagnostic tests	
Milestones	**Examples**
Level 1 *Articulates a methodology for clinical reasoning* *Identifies resources to direct clinical decisions*	● Presents a patient complaining of knee pain, including relevant musculoskeletal symptoms and activity history after interviewing the patient ● Investigates medical record for ancillary treatments including physical and/or occupational therapies, bracing, injections ● Orders appropriate basic imaging studies for the involved knee
Level 2 *Demonstrates clinical reasoning to determine treatment goals* *Selects and prioritizes relevant resources based on scenario to inform decisions*	● Prioritizes common-to-rare differential diagnoses for knee pain relevant to patient history ● Interprets plain radiographs to determine presence of acute and/or chronic conditions ● Relates the potential findings seen on plain radiographs (e.g., fracture, subchondral sclerosis, malalignment) ● Orders indicated advanced imaging studies and relates the potential findings noted on MRI for an ACL injury ● Applies the appropriate use criteria to an individual patient
Level 3 *Synthesizes information to make clinical decisions for straightforward conditions* *Integrates evidence-based information to inform diagnostic decision-making for straightforward conditions*	● Prioritizes a broad differential diagnosis for the presentation of knee pain to include hip and spine pathology, infection, and inflammatory etiologies ● Orders appropriate adjunct plain radiographs (e.g., hip, hip-to-knee, weight bearing) to inform comprehensive diagnosis ● Describes the appropriate clinical practice guidelines to guide non-operative and surgical decision making for knee pathology ● Uses the clinical and radiological findings to make a preliminary diagnosis of ligamentous knee injury and a preliminary treatment plan
Level 4 *Efficiently synthesizes information and integrates reflection to make clinical decisions for complex conditions* *Integrates evidence-based information to inform diagnostic decision-making for complex conditions*	● Adjusts surgical plan to incorporate treatment of malalignment and chondral, meniscal injuries ● Considers patient factors in timing and reconstruction options for an ACL injury ● Incorporates clinical practice guidelines into clinical/radiologic findings to develop a comprehensive surgical and rehabilitation plan ● Uses current evidence and other resources to decide most appropriate ACL graft
Level 5 *Incorporates clinical reasoning to improve care pathways*	● Demonstrates knowledge of the interlinked effects of biologic materials, surgical treatment, and rehabilitation protocols and applies them to appropriate patient populations and specific patient needs

	● Understands the methodology for applying appropriate use criteria
Assessment Models or Tools	● Case-based discussions ● Multisource feedback ● Medical record (chart) audit ● Preceptor encounters ● Reflection
Curriculum Mapping	●
Notes or Resources	● Croskerry P. Achieving quality in clinical decision making: Cognitive strategies and detection of bias. *Academic Emergency Medicine*. 2002;9(11):1184-1204. https://onlinelibrary.wiley.com/doi/abs/10.1197/aemj.9.11.1184?sid=nlm%3Apubmed. ● Hedrick TL, Young JS. The use of "war games"' to enhance high-risk clinical decision-making in students and residents. *The American Journal of Surgery*. 2008;195(6):843-849. https://pubmed.ncbi.nlm.nih.gov/18440485/. ● Humbert AJ, Besinger B, Miech Ej. Assessing clinical reasoning skills in scenarios of uncertainty: convergent validity for a Script Concordance Test in an emergency medicine clerkship and residency. *Acad Emerg Med*. 2011;18(6):627-634. https://onlinelibrary.wiley.com/doi/full/10.1111/j.1553-2712.2011.01084.x. ● Norman GR, Monteiro SD, Sherbino J, Ilgen JS, Schmidt HG, Mamede S. The causes of errors in clinical reasoning: Cognitive biases, knowledge deficits, and dual process thinking. *Acad Med*. 2017;92(1):23-30. https://journals.lww.com/academicmedicine/Fulltext/2017/01000/The_Causes_of_Errors_in_Clinical_Reasoning_.13.aspx. ● Royce CS, Hayes MM, Schwartzstein RM. Teaching critical thinking: a case for instruction in cognitive biases to reduce diagnostic errors and improve patient safety. *Acad Med*. 2019;94(2):187-194. https://journals.lww.com/academicmedicine/Fulltext/2019/02000/Teaching_Critical_Thinking__A_Case_for_Instruction.20.aspx.

Medical Knowledge 2: Basic Science: Gross Anatomy, Microanatomy, Rehabilitation and Kinesiology, Pathophysiology, Tissue Healing, Inflammation, and Cartilage **Overall Intent:** To acquire fundamental knowledge of normal musculoskeletal anatomy, pathoanatomy, and the mechanisms of healing relevant to the musculoskeletal system in the context of sports injuries	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of regional gross anatomy*	● Demonstrates knowledge of gross anatomy – particularly extremity anatomy
Demonstrates knowledge of basic kinesiology	● Demonstrates knowledge of gait cycle and phases of throwing
Demonstrates basic knowledge of cellular biology	● Demonstrates knowledge of bone remodeling and stress reactions
Level 2 *Demonstrates knowledge of surgical anatomy and pathophysiology*	● Demonstrates knowledge of intermuscular and internervous planes for surgical exposure
Demonstrates knowledge of basic science of injury and rehabilitation after injury or surgery	● Identifies the relationship between the throwing cycle and upper extremity injuries in the overhead athlete ● Demonstrates the knowledge of eccentric/concentric muscle contraction in both injuries and rehabilitation
Demonstrates knowledge of the basic science of inflammation and healing	● Demonstrates knowledge of inflammation and repair processes
Level 3 *Applies knowledge of anatomy and pathophysiology to explain the effects of surgical or non-surgical treatment on patient outcomes for straightforward conditions*	● Applies knowledge of the anatomy and pathophysiology of the etiology of PCL tears or elbow ulnar collateral ligament (UCL) tears, ACL tears, meniscal pathology, rotator cuff tear, shoulder and hip impingement syndromes, intrinsic/extrinsic femoroacetabular impingement, etc.
Applies knowledge of biomechanics of injury and rehabilitation	● Discusses real-time application of biomechanics to current injuries
Applies knowledge of soft tissue healing and cellular mechanisms	● Applies knowledge of protective devices and pain management to allow for earlier return-to-play
Level 4 *Applies knowledge of anatomy and pathophysiology to explain the effects of surgical or non-surgical treatment on patient outcomes for complex conditions*	● Applies knowledge of the anatomy and pathophysiology of the etiology of chronic multi-ligament knee injury ● Understands the role of mechanical alignment in cartilage injuries

Applies knowledge of the details of rehabilitation protocols and preventive techniques *Applies knowledge of the details of tissue healing and cellular physiology of treatment modalities*	● Understands the role of bone loss with chronic shoulder instability ● Applies knowledge of biologics for treatment
Level 5 *Develops and/or disseminates knowledge of basic science topics in sports medicine*	● Presents at a regional conference on the use of biologics ● Presents at a national conference for epidemiology and treatment options for knee injuries
Assessment Models or Tools	● Direct observation ● E-module multiple choice tests ● Multisource feedback ● Presentations (morbidity and mortality (M and M), didactics)
Curriculum Mapping	●
Notes or Resources	● Kjaer M., Krogsgaard M Magnussin P, Engebretsen L, Roos H, Takala T, Woo, SLY. *Textbook of Sports Medicine: Basic Science and Clinical Aspects of Sports Injury and Physical Activity*. Hoboken, NJ: Wiley-Blackwell; 2008. ● Miller MD, Thompson SR, *DeLee, Drez, and Miller's Orthopaedic Sports Medicine*, 5th ed., Amsterdam, Netherlands: Elsevier; 2020. ● Azar, F. *Orthopaedic Knowledge Update: Sports Medicine 6*, Rosemont, Illinois: American Academy of Orthopaedic Surgeons and Wolters Kluwer; 2020.

Systems-Based Practice 1: Patient Safety and Quality Improvement (QI) **Overall Intent:** To engage in the analysis and management of patient safety events, including relevant communication with patients, families, and health care professionals; to conduct a QI project	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of common patient safety events* *Demonstrates knowledge of how to report patient safety events* *Demonstrates knowledge of basic quality improvement methodologies and metrics*	● Lists patient misidentification or medication errors as common patient safety events ● Identifies pain medication safety issues when cross referencing patient medications ● Reports lack of implementation of identifier (e.g., non-slip socks) or room door sign in geriatric patient population at risk for falls ● Describes how to report errors in the local clinical environment ● Knows the systems process for communicating potential medication errors ● Summarizes protocols resulting in fall reduction ● Summarizes common home issues to mitigate fall issues such as room carpets and grab bars
Level 2 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems (simulated or actual)* *Describes local quality improvement initiatives*	● Identifies geriatric patient characteristics contributing to fall risk ● Correctly applies a Plan Do Study Act (PDSA) QI project to help eliminate narcotic dependency in a trauma-injured patient ● Describes root cause analysis process
Level 3 *Participates in analysis of patient safety events (simulated or actual)* *Participates in disclosure of patient safety events to patients and their families (simulated or actual)* *Participates in local quality improvement initiatives*	● Prepares for M and M presentations ● Communicates, under supervision, with patients/families about a medication error ● Participates in protocol with risk management to disclose medication errors
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)*	● Collaborates with a team to conduct the analysis of fall occurrences and can effectively communicate with patients/families about those events

Discloses patient safety events to patients and their families (simulated or actual) *Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project*	● Participates in a QI project to decrease frequency of falls within the practice
Level 5 *Actively engages teams and processes to modify systems to prevent patient safety events* *Role models or mentors others in the disclosure of patient safety events* *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	● Assumes a leadership role at the departmental or institutional level for patient safety ● Conducts a simulation for disclosing patient safety events ● Recognizes the need for and completes a QI project to decrease risk of spinal injury during equipment removal for suspected cervical spine trauma
Assessment Models or Tools	● Direct observation ● E-module multiple choice tests ● Hospital safety report audit ● Multisource feedback ● Presentations (M and M, QI) ● Reflection ● Simulation
Curriculum Mapping	●
Notes or Resources	● Institute of Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. Accessed 2021.

Systems-Based Practice 2: System Navigation for Patient-Centered Care **Overall Intent:** To effectively navigate the health care system, including the interdisciplinary team and other care providers, to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of care coordination* *Identifies key elements for safe and effective transitions of care and hand-offs*	● For an athlete who needs surgery, refers patient to physical therapist/athletic trainer ● Lists follow-up of labs, testing, new medications, and consults as essential components of a sign-out
Level 2 *Coordinates care of patients in routine clinical situations, effectively using the roles of interprofessional team members* *Performs safe and effective transitions of care/hand-offs in straightforward clinical situations*	• For an athlete who needs surgery for an injury, coordinates collaborative care with physical therapists and athletic training providers ● Uses a systematic institutional process during routine sign-out
Level 3 *Coordinates care of patients in complex clinical situations, effectively using the roles of interprofessional team members* *Performs safe and effective transitions of care/hand-offs in complex clinical situations*	● Coordinates complex care with the academic advisor/athletic trainer for an injured college athlete to ensure appropriate medical aftercare ● Uses institutional protocol when transferring a complex patient to an air ambulance
Level 4 *Role models effective coordination of patient-centered care among multidisciplinary team members* *Role models and advocates for safe and effective transitions of care/hand-offs*	● Leads team members during inpatient care in appropriate consultation with care coordination in disposition of an injured athlete ● Plans for cross-coverage in case of unanticipated absence of a team member
Level 5 *Analyzes the process of care coordination and leads in the design and implementation of improvements* *Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes*	● Leads a community outreach program to design and implement a throwing program to minimize elbow and shoulder injuries in adolescent athletes ● Develops a protocol (care pathways for various orthopaedic conditions) to improve transitions to return to play
Assessment Models or Tools	● Direct observation ● Multisource feedback

	● Quality metrics and goals mined from electronic health records (EHR) ● Review of sign-out tools, use and review of checklists
Curriculum Mapping	●
Notes or Resources	● Centers for Disease Control. Population health training. https://www.cdc.gov/pophealthtraining/whatis.html. Accessed 2021. ● Hospitals in Pursuit of Excellence. Preventing patient falls: A systematic approach from the Joint Commission Center for Transforming Healthcare project. http://www.hpoe.org/Reports-HPOE/2016/preventing-patient-falls.pdf. Accessed 2021. ● Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science*. 1st ed. Philadelphia, PA: Elsevier; 2016. https://commerce.ama-assn.org/store/ui/catalog/productDetail?product_id=prod2780003.

Systems-Based Practice 3: Physician Role in Health Care Systems **Overall Intent:** To understand the physician's role in the complex health care system and how to operate effectively within the system to improve patient care	
Milestones	**Examples**
Level 1 *Describes basic health payment systems, including government, private, public, and uninsured care, as well as different practice models*	● Articulates the differences between home care, outpatient physical therapy, and maintenance conditioning
Level 2 *Describes how working within the health care system impacts patient care, including billing and coding*	● Identifies coding requirements for clinical documentation ● Explains that improving patient satisfaction potentially improves patient compliance ● Recognizes that appropriate comorbidity documentation can influence the injury recovery and return to play ● Understands the impact of health plan coverage on durable medical equipment costs for individual patients
Level 3 *Analyzes how personal practice affects the system (e.g., length of stay, readmission rates, clinical efficiency)*	● Ensures compliance with care pathways to optimize length of stay ● Understands the role of patient education in decreasing readmission rates ● Takes into consideration patient's physical therapy treatment coverage when recommending injury treatment
Level 4 *Uses shared decision- making in patient care, considering costs to the patient*	● Ensures proper documentation of qualifying hospital stay prior to discharging a patient for physical therapy ● Works collaboratively to improve patient assistance resources for a patient with a recent injury treated surgically and has limited resources ● Tailors treatment decisions to patient resources/insurance status (e.g., prescribing a brace versus applying a splint)
Level 5 *Participates in advocacy activities for health policy*	● Works with community or professional organizations to advocate for playground equipment safety measures ● Improves informed consent process for non-English-speaking patients requiring interpreter services ● Performs clinical research that effects health care barriers
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Patient satisfaction data ● Portfolio
Curriculum Mapping	●
Notes or Resources	● Agency for Healthcare Research and Quality (AHRQ). Measuring the quality of physician care. https://www.ahrq.gov/talkingquality/measures/setting/physician/index.html. Accessed 2021.

	● AHRQ. Major physician measurement sets. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. Accessed 2021. ● The Commonwealth Fund. Health system data center. http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1. 2021. ● Dzau VJ, McClellan MB, McGinnis JM, et al. Vital directions for health and health care: Priorities from a National Academy of Medicine initiative. *JAMA*. 2017;317(14):1461-1470. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. ● The Kaiser Family Foundation. www.kff.org. Accessed 2021. ● The Kaiser Family Foundation. Health reform. https://www.kff.org/topic/health-reform/. Accessed 2021.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice **Overall Intent:** To incorporate evidence and patient values into clinical practice	
Milestones	**Examples**
Level 1 *Demonstrates how to access and use available evidence, and incorporate patient preferences and values to the care of a straightforward condition*	● Compares evidence-based guidelines and literature review for non-operative versus operative treatment of an ACL rupture
Level 2 *Articulates clinical questions and elicits patient preferences and values to guide evidence-based care*	● Identifies and discusses potential evidence-based treatment options including graft options and selection for a patient with an ACL rupture
Level 3 *Locates and applies the best available evidence, integrated with patient preferences, to the care of complex conditions*	● Obtains, discusses, and applies evidence for the treatment of a patient with an ACL rupture with an associated lateral meniscus tear and PLC injury ● Understands and appropriately uses clinical practice guidelines in making patient care decisions while eliciting patient preferences for operative versus non-operative treatment
Level 4 *Critically appraises and applies evidence, even in the face of uncertainty and conflicting evidence, to guide care tailored to the individual patient*	● Accesses the primary literature to identify various treatment strategies and either early or delayed surgical management for a multi-ligamentous knee injury
Level 5 *Coaches others to critically appraise and apply evidence for complex conditions, and/or participates in the development of guidelines*	● Leads clinical discussion on application of evidence-based practice for treatment of graft choice in ACL reconstruction ● Develops a youth program to decrease risk of ACL rupture
Assessment Models or Tools	● Core conference participation ● Direct observation ● Oral or written examinations ● Presentation evaluation
Curriculum Mapping	●
Notes or Resources	• AO Foundation surgery reference. (national organization guidelines, e.g., American Osteopathic Association, American Academy of Orthopaedic Surgeons) https://surgeryreference.aofoundation.org/orthopedic-trauma/adult-trauma/proximal-femur/femoral-neck-fracture-subcapital-displaced. Accessed 2021. • Orthopaedic Trauma Association (OTA). Femoral neck fractures. https://ota.org/sites/files/2018-08/L02-Femoral%20Neck%20Fractures.pdf. Accessed 2021. • Various journals (*Journal of the American Academy of Orthopaedic Surgeons, Journal of Orthopaedic Trauma, Journal of Arthroplasty*)

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth **Overall Intent:** To seek clinical performance information with the intent to improve care; reflects on all domains of practice, personal interactions, and behaviors, and their impact on colleagues and patients (reflective mindfulness); develop clear objectives and goals for improvement in some form of a learning plan	
Milestones	**Examples**
Level 1 *Accepts responsibility for personal and professional development by establishing goals* *Identifies the strengths, deficiencies, and limitations in one's knowledge and expertise*	● Sets a study plan for National Sports Society pre- and post-fellowship examination ● Reflects on feedback from patient care team members ● Identifies gaps in knowledge
Level 2 *Demonstrates openness to feedback and other input to inform goals* *Analyzes and reflects on the strengths, deficiencies, and limitations in one's knowledge and expertise to design a learning plan, with assistance*	● Integrates and responds to feedback to adjust clinical performance ● Assesses time management skills and how they impact timely completion of clinic notes and literature reviews ● Develops individual education plan to improve study skills and knowledge base, with assistance
Level 3 *Responds to feedback and other input episodically, with adaptability and humility* *Creates and implements a learning plan to optimize educational and professional development*	● Uses feedback to modify personal professional development goals ● Creates a comprehensive personal curriculum to improve education, including monitoring and accountability for a study plan
Level 4 *Actively seeks feedback and other input, with adaptability and humility* *Uses ongoing reflection, feedback, and other input to measure the effectiveness of the learning plan and, when necessary, improves it*	● Asks for feedback from peers, faculty members, and ancillary team members ● Debriefs with the attending and other patient care team members after patient encounter to optimize future collaboration in the care of the patient and family ● Uses the results from the National Sports Society pre-fellowship examination to modify the study plan to address deficiencies
Level 5 *Role models consistently seeking feedback and other input with adaptability and humility* *Coaches others on reflective practice*	● Models and teaches practice improvement through focused study and reflective feedback ● Develops educational module for collaboration with other patient care team members
Assessment Models or Tools	● Core conference participation

	● Direct observation ● Review of learning plan
Curriculum Mapping	●
Notes or Resources	● Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. *Academic Pediatrics*. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/pdf. ● Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Academic Medicine*. 2009;84(8):1066-1074. https://journals.lww.com/academicmedicine/fulltext/2009/08000/Measurement_and_Correlates_of_Physicians__Lifelong.21.aspx. ● Lockspeiser TM, Schmitter PA, Lane JL, Hanson JL, Rosenberg AA, Park YS. Assessing residents' written learning goals and goal writing skill: validity evidence for the learning goal scoring rubric. *Academic Medicine*. 2013;88(10):1558-1563. https://journals.lww.com/academicmedicine/fulltext/2013/10000/Assessing_Residents__Written_Learning_Goals_and.39.aspx.

Professionalism 1: Professional Behavior and Ethical Principles **Overall Intent:** To recognize and address lapses in ethical and professional behavior, demonstrates ethical and professional behaviors, and use appropriate resources for managing ethical and professional dilemmas	
Milestones	**Examples**
Level 1 Demonstrates professional behavior in straightforward situations Demonstrates knowledge of the ethical principles underlying patient care (e.g., informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics)	● Identifies fatigue, illness, increased substance/alcohol use, and unmanaged stress as contributing factors to professional lapses ● Relates the importance of patient autonomy as it relates to informed consent including the role of surrogates and advance directives ● Understands the impact of disclosing errors in patient care and loss of patient confidentiality
Level 2 *Demonstrates insight into professional behavior in straightforward situations and describes inciting events for lapses in professionalism* *Applies ethical principles in straightforward situations and takes responsibility for lapses*	● Understands perceptions created by tone of voice, timing/place of feedback within the health care team during daily patient care activities ● Notifies appropriate people of personal mistakes; does not make excuses ● Accepts responsibility when supervising residents who do not provide appropriate instruction to learners (e.g., wrong labs, splint)
Level 3 *Demonstrates professional behavior in complex situations* *Integrates ethical principles and recognizes the need to seek help in complex situations*	● Does not attribute blame when discussing adverse outcome with family members or the patient ● Uses respectful, unemotional communication in discussions when resolving conflict within health care team ● Notifies site director or appropriate supervisor after noticing a colleague that seems to be impaired
Level 4 *Recognizes situations that may promote professionalism lapses and intervenes to prevent lapses in oneself and others* *Recognizes and uses appropriate resources for managing and resolving ethical dilemmas (e.g., ethics consultations, literature review, risk management/legal consultation)*	● Acts in patient's best interest when collaborating with other health care services to determine appropriate admission service ● Responds to inappropriate microaggressions ● Elevates issues regarding end-of-career decisions to appropriate channels when family or other conflict is evident (e.g., Ethics Committee, legal counsel, risk management)
Level 5 *Coaches others when their behavior fails to meet professional expectations*	● Chooses appropriate setting and tone in discussions with others regarding suboptimal professional behavior

Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution	● Recognizes source of repetitive conflict between members of health care team and recommends institutional policy to resolve ● Devises materials to aid others in learning to provide informed consent
Assessment Models or Tools	● Direct observation ● Global evaluation ● Multisource feedback ● Oral or written self-reflection ● Simulation
Curriculum Mapping	●
Notes or Resources	● American Medical Association (AMA). Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. Accessed 2021. ● ABIM Foundation, ACP-ASIM Foundation, European Federation of Internal Medicine. Medical professionalism in the new millennium: A physician charter. *Perspectives*. 2002. https://abimfoundation.org/wp-content/uploads/2015/12/Medical-Professionalism-in-the-New-Millenium-A-Physician-Charter.pdf. ● Bynny RL, Paauw DS, Papadakis MA, Pfeil S. *Medical Professionalism Best Practices: Professionalism in the Modern Era*. Aurora, CO: Alpha Omega Alpha Medical Society; 2017. http://alphaomegaalpha.org/pdfs/Monograph2018.pdf. ● Domen RE, Johnson K, Conran RM, et al. Professionalism in pathology: A case-based approach as a potential education tool. *Arch Pathol Lab Med.* 2017;141(2):215-219. https://meridian.allenpress.com/aplm/article/141/2/215/132523/Professionalism-in-Pathology-A-Case-Based-Approach. ● Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. New York, NY: McGraw-Hill Education; 2014. https://accessmedicine.mhmedical.com/book.aspx?bookID=1058.

Professionalism 2: Accountability/Conscientiousness **Overall Intent:** To take responsibility for one's own actions and the impact on patients and other members of the health care team	
Milestones	**Examples**
Level 1 *Reliably arrives to clinical activities on time and describes strategies for ensuring timely task completion* *Responds promptly to requests or reminders to complete tasks and responsibilities*	● Completes work hour logs promptly ● Exhibits punctuality in conference attendance ● Completes end-of-rotation evaluations
Level 2 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in straightforward situations* *Completes tasks and responsibilities without reminders*	● Completes administrative tasks, documents safety modules, procedure review, and licensing requirements by specified due date ● Completes tasks before going out of town in anticipation of lack of computer access while traveling
Level 3 *Prioritizes tasks and responsibilities in a timely manner with appropriate attention to detail in complex situations* *Proactively completes tasks and responsibilities to ensure that the needs of patients, teams, and systems are met*	● Notifies attending of multiple competing demands on call, appropriately triages tasks, and asks for assistance from other fellows, residents, or faculty members as needed ● Arranges coverage for assigned clinical tasks in preparation for being out of the office to ensure appropriate continuity of care
Level 4 *Recognizes barriers that may impact others' ability to complete tasks and responsibilities in a timely manner*	● Takes responsibility for inadvertently omitting key patient information during sign-out ● Recognizes personal deficiencies in communication with team members about patient care needs ● Recognizes when multiple providers are unavailable, the outpatient clinic will be negatively affected, and appointments delayed
Level 5 *Develops processes to enhance the health care team's ability to efficiently complete patient care tasks and responsibilities*	● Leads interdisciplinary team to identify problems and specific solutions to develop a process to streamline patient experience
Assessment Models or Tools	● Compliance with deadlines and timelines ● Direct observation ● Global evaluations ● Multisource feedback ● Self-evaluations and reflective tools ● Simulation

Curriculum Mapping	●
Notes or Resources	● AMA. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. Accessed 2021. ● American Academy of Orthopaedic Surgeons (AAOS). Code of Ethics and Professionalism for Orthopaedic Surgeons. https://www.aaos.org/about/bylaws-policies/ethics-and-professionalism/code/. Accessed 2021. ● Code of conduct from fellow/resident institutional manual ● Expectations of fellowship program regarding accountability and professionalism

Professionalism 3: Well-Being **Overall Intent:** To identify, use, manage, improve, and seek help for personal and professional well-being for self and others	
Milestones	**Examples**
Level 1 *Recognizes the importance of addressing personal and professional well-being (e.g., physical and emotional health)*	● Acknowledges own response to patient's poor outcome ● Receives feedback on missed emotional cues after a family meeting
Level 2 *Lists available resources for personal and professional well-being*	● Independently identifies and communicates impact of a personal tragedy or serious athletic injury ● Lists graduate medical education counseling services, suicide hotline, and well-being committee representatives available at the institution
Level 3 *Discusses a plan to promote personal and professional well-being with institutional support*	● Develops a reflective response to deal with personal impact of difficult patient encounters and disclosures with the interdisciplinary team
Level 4 *Independently develops a plan to promote personal and professional well-being*	● Identifies ways to independently manage personal stress and responses to unexpected patient outcomes
Level 5 *Creates institutional level interventions that promote colleagues' well-being*	● Assists in organizational efforts to address clinician well-being after patient diagnosis/prognosis/death
Assessment Models or Tools	● Direct observation ● Group interview or discussions for team activities ● Individual interview ● Institutional online training modules ● Self-assessment and personal learning plan
Curriculum Mapping	●
Notes or Resources	● This subcompetency is not intended to evaluate a fellow's well-being, but to ensure each fellow has the fundamental knowledge of factors that impact well-being, the mechanisms by which those factors impact well-being, and available resources and tools to improve well-being. ● ACGME. Tools and Resources. https://dl.acgme.org/pages/well-being-tools-resources. Accessed 2022. ● Ames SE, Cowan JB, Kenter K, Emery S, Halsey D. Burnout in orthopaedic surgeons: A challenge for leaders, learners, and colleagues: AOA critical issues. *J Bone Joint Surg Am.* 2017;99(14):e78. https://journals.lww.com/jbjsjournal/Abstract/2017/07190/Burnout_in_Orthopaedic_Surgeons__A_Challenge_for.12.aspx. ● Daniels AH, DePasse JM, Kamal RN. Orthopaedic surgeon rurnout: diagnosis, treatment, and prevention. *J Am Acad Orthop Surg*. 2016;24(4):213-9.

	https://www.researchgate.net/publication/294918464_Orthopaedic_Surgeon_Burnout_Diagnosis_Treatment_and_Prevention. ● Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: Personal and professional development. *Acad Pediatr*. 2014 Mar-Apr;14(2 Suppl):S80-97. https://pubmed.ncbi.nlm.nih.gov/24602666/. ● Local resources, including Employee Assistance

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication **Overall Intent:** To deliberately use language and behaviors to form constructive relationships with patients and family; identify communication barriers including recognizing biases, and health care needs while respecting patient autonomy in communications; organize and lead communication around shared decision making	
Milestones	**Examples**
Level 1 *Demonstrates respect and establishes rapport with patients and their families* *Communicates with patients and their families in an understandable and respectful manner*	● Introduces self and faculty member, identifies patient and others in the room, and engages all parties in health care discussion with sensitivities to patient and family dynamics ● Identifies need for trained interpreter with non-English-speaking patients ● Uses age-appropriate and health literacy-appropriate language
Level 2 *Establishes a therapeutic relationship in straightforward encounters* *Identifies barriers to effective communication*	● Avoids medical jargon and restates patient perspective when discussing a diagnosis and treatment options of a simple fracture ● Uses patient-centered communication when answering questions during the informed consent process ● Recognizes the need for handouts with diagrams and pictures to communicate information to a patient who is unable to read
Level 3 *Establishes a therapeutic relationship in challenging encounters* *When prompted, reflects on biases while attempting to minimize communication barriers*	● Acknowledges a patient's request for an inappropriate diagnostic study and respectfully redirects and initiates a treatment plan using only appropriate studies ● Modifies a treatment plan to achieve patient's goal after a middle-aged patient states a desire to run a marathon despite knee pain, even though the physician has biases about high-impact activity in early arthritis
Level 4 *Facilitates difficult discussions to patients and their families* *Recognizes biases and integrates the patient's viewpoint and autonomy to ensure effective communication*	● Counsels representative family members in the care of a patient with season or career ending injury (ACL tear, multi-ligament knee injury, etc.) ● Discusses a middle-aged patient's goal to run a marathon after knee replacement surgery despite bias about high-impact activity on a knee replacement; includes identification of risks, benefits, and long-term effects of high-impact running, and a treatment plan to achieve the patient's goal
Level 5 *Coaches others in the facilitation of difficult conversations* *Mentors others in situational awareness and critical self-reflection*	● Leads an objective structured clinical exam (OSCE) for obtaining informed consent in knee ligament surgery ● Encourages others to take the Implicit Bias Test (link in "Notes or Resources") and leads a discussion about impact of bias in residency/fellowship

	● Observes interactions between more junior residents and patients and offers constructive feedback ● Serves on a hospital bioethics committee
Assessment Models or Tools	● Direct observation ● Self-assessment including self-reflection exercises ● Simulation ● Standardized patients
Curriculum Mapping	●
Notes or Resources	● Laidlaw A, Hart J. Communication skills: an essential component of medical curricula. Part I: Assessment of clinical communication: AMEE Guide No. 51. *Med Teach*. 2011;33(1):6-8. https://www.tandfonline.com/doi/full/10.3109/0142159X.2011.531170. ● Makoul G. Essential elements of communication in medical encounters: The Kalamazoo consensus statement. *Acad Med*. 2001;76:390-393. https://pubmed.ncbi.nlm.nih.gov/11299158/. ● Project Implicit. https://implicit.harvard.edu/implicit/takeatest.html. Accessed 2021. ● Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in residents. *BMC Med Educ*. 2009;9:1. https://bmcmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1. ● Picker Institute of Patient Centered Care https://www.ipfcc.org/resources/Patient-Centered-Care-The-Road-Ahead.pdf

Interpersonal and Communication Skills 2: Interprofessional and Team Communication **Overall Intent:** To effectively communicate with the health care team, including other care providers, staff members, and ancillary personnel, in both straightforward and complex situations	
Milestones	**Examples**
Level 1 *Recognizes the value and role of each team member and respectfully interacts with all members of the health care team*	● Answers questions respectfully and patiently for clinic staff members regarding patient-specific orders understanding the important role of others in care of the orthopaedic patient ● Receives an emergency department consult for a simple fracture and respectfully takes the patient information
Level 2 *Communicates in a professional and productive manner to facilitate teamwork (e.g., active listening, updates in timely fashion)*	● Communicates with the care team the need for specialized techniques related to fracture care ● Communicates with the emergency department physician a diagnosis of evolving compartment syndrome and need for timely optimization and mobilization of the patient to the operating room
Level 3 *Actively recognizes and mitigates communication barriers and biases with the health care team*	● Communicates respectfully with sports medicine team (athletic trainer, physical therapy, primary care sports medicine provider, etc.) the prioritization of treatment of athletic related injuries ● Recognizes the need for respectful communication between providers when a conflict arises regarding prioritization of treatment
Level 4 *Facilitates respectful communications and conflict resolution with the multidisciplinary health care team*	● Initiates a multidisciplinary conversation to alleviate conflict around a shared care plan for a patient with shoulder instability, ankle instability, etc. ● Attends athletic training room/facility to review athlete findings regarding injury and treatment plan and recovery from surgical treatment for student-athletes
Level 5 *Exemplar of effective and respectful communication strategies*	● Mediates a conflict resolution between different members of the health care team
Assessment Models or Tools	● Direct observation ● Global assessment ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● Braddock CH, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: Time to get back to basics. *JAMA.* 1999;282(24):2313-2320. https://pubmed.ncbi.nlm.nih.gov/10612318/. ● Breitbach AP, Reeves S, Fletcher, SN. Health care as a team sport? Studying athletics to improve interprofessional collaboration. *Sports*. 2017;5(62): 1-12 ● Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. *MedEdPORTAL*. 2015;11:10174 http://doi.org/10.15766/mep_2374-8265.10174.

	● Fay D, Mazzone M, Douglas L, Ambuel B. A validated, behavior-based evaluation instrument for family medicine residents. *MedEdPORTAL.* https://www.mededportal.org/doi/10.15766/mep_2374-8265.622. ● François J. Tool to assess the quality of consultation and referral request letters in family medicine. *Can Fam Physician*. 2011 May;57(5), 574–575. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093595/. ● Green M, Parrott T, Cook G., Improving your communication skills. *BMJ* 2012;344. https://www.bmj.com/content/344/bmj.e357. ● Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: A review with suggestions for implementation. *Med Teach*. 2013 May; 35(5):395-403. https://pubmed.ncbi.nlm.nih.gov/23444891/. ● Lane JL, Gottlieb RP. Structured clinical observations: A method to teach clinical skills with limited time and financial resources. *Pediatrics*. 2000;105(4 Pt 2):973-977. https://pubmed.ncbi.nlm.nih.gov/10742358/. ● Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. *Med Teach*. 2019;41(7):746-749. https://pubmed.ncbi.nlm.nih.gov/30032720/. ● Fletcher S, Breitbach AP, Reeves, SN. Interprofessional collaboration in sports medicine: Findings from a scoping review. Health, Interprofessional Practice & Education. 2017;3(2): eP1128. ● Interprofessional Education Collaborative. Core competencies for interprofessional collaborative practice: 2016 update. 2016; Washington, DC

Interpersonal and Communication Skills 3: Communication within Health Care Systems **Overall Intent:** To effectively communicate across the health care system using the medical record	
Milestones	**Examples**
Level 1 *Accurately records information in the patient record while safeguarding patient personal health information*	● Documents relevant information accurately ● Maintains compliance with National Collegiate Athletic Association (NCAA) confidentiality rules regarding patient information ● Maintains Family Educational Rights and Privacy Act (FERPA) and Health Insurance Portability and Accountability Act (HIPAA) compliance with all communications
Level 2 *Demonstrates accurate, timely, and efficient use of the electronic health record to communicate with members of the health care team*	● Documents clinical reasoning in an organized manner that supports the treatment plan ● Develops documentation templates to avoid copy-and-paste errors
Level 3 *Concisely reports diagnostic and therapeutic reasoning while incorporating relevant outside data*	● Documents a clear rationale for surgical treatment of common athletic injuries (shoulder instability, ACL tear, etc.) ● Review outside records from previous injury to generate appropriate revision to a surgical plan
Level 4 *Independently communicates via written or verbal methods based on urgency and context*	● Calls attending with assessment and recommends a plan for surgical treatment of a complex athletic injury (ankle fracture/dislocation, etc.) ● Triages and communicates time urgency of treatment of knee dislocation, ankle dislocation, etc.
Level 5 *Facilitates improved written and verbal communication of others*	● Holds face-to-face discussions with athletic trainers and physical therapists to improve documentation
Assessment Models or Tools	● Direct observation ● Medical record (chart) review ● Multisource feedback ● Rotation evaluation
Curriculum Mapping	●
Notes or Resources	● Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: Validity evidence for a checklist to assess progress notes in the electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. ● Haig KM, Sutton S, Whittington J. SBAR: A shared mental model for improving communication between clinicians. *Jt Comm J Qual Patient Saf*. 2006;32(3)167-175. https://www.ncbi.nlm.nih.gov/pubmed/16617948.

	● Starmer AJ, Spector ND, Srivastava R, et al. I-PASS, a mnemonic to standardize verbal handoffs. *Pediatrics*. 2012;129(2):201-204. https://ipassinstitute.com/wp-content/uploads/2016/06/I-PASS-mnemonic.pdf.

To help programs transition to the new version of the Milestones, the ACGME has mapped the original Milestones 1.0 to the new Milestones 2.0. Indicated below are where the subcompetencies are similar between versions. These are not exact matches but are areas that include similar elements. Not all subcompetencies map between versions. Inclusion or exclusion of any subcompetency does not change the educational value or impact on curriculum or assessment.

Milestones 1.0	Milestones 2.0
PC1: Non-operative: history and physical examination, imaging interpretation, common medical issues treatment and referral	PC1: History and Physical Examination, Imaging Interpretation, and Diagnosis PC2: Non-Operative Management
PC2: Operative Skills	PC3: Arthroscopic Operative Skills PC4: Open Operative Skills
PC3: Team Coverage and Athletic Care	PC5: Team Coverage and Athletic Care
MK1: Basic Science	MK2: Basic Science
MK2: Medical Issues	No match
MK3: Musculoskeletal	No match
No match	MK1: Orthopaedic Clinical Decision Making
SBP1: Working with inter-professional teams to enhance athletic care and safety	SBP1: Patient Safety and Quality Improvement SBP2: System Navigation for Patient-Centered Care
SBP2: Systems thinking	SBP3: Physician Role in the Health Care Systems
PBLI1: Self-directed learning	PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI2: Locate, appraise, and contribute to evidence to improve patient care	PBLI1: Evidence-Based and Informed Practice
PROF1: Compassion, integrity, respect for others, and sensitivity to the diversity of the athlete	PROF1: Professional Behavior and Ethical Principles
PROF2: Accountability to patients, society, and the profession; personal responsibility to maintain emotional, physical, and mental health	PROF2: Accountability/Conscientiousness PROF3: Self-Awareness and Help-Seeking
ICS1: Communication	ICS1: Patient- and Family-Centered Communication
ICS2: Teamwork	ICS2: Interprofessional and Team Communication
No match	ICS3: Communication within Health Care Systems

Available Milestones Resources

Milestones 2.0: Assessment, Implementation, and Clinical Competency Committees Supplement, 2021 - *https://meridian.allenpress.com/jgme/issue/13/2s*

Milestones Guidebooks: https://www.acgme.org/milestones/resources/

- *Assessment Guidebook*
- *Clinical Competency Committee Guidebook*
- *Clinical Competency Committee Guidebook Executive Summaries*
- *Implementation Guidebook*
- *Milestones Guidebook*

Milestones Guidebook for Residents and Fellows: https://www.acgme.org/residents-and-fellows/the-acgme-for-residents-and-fellows/

- Milestones Guidebook for Residents and Fellows
- Milestones Guidebook for Residents and Fellows Presentation
- Milestones 2.0 Guide Sheet for Residents and Fellows

Milestones Research and Reports: https://www.acgme.org/milestones/research/

- *Milestones National Report*, updated each fall
- *Milestones Predictive Probability Report,* updated each fall
- *Milestones Bibliography*, updated twice each year

Developing Faculty Competencies in Assessment courses - https://www.acgme.org/meetings-and-educational-activities/courses-and-workshops/developing-faculty-competencies-in-assessment/

Assessment Tool: Direct Observation of Clinical Care (DOCC) - https://dl.acgme.org/pages/assessment

Assessment Tool: Teamwork Effectiveness Assessment Module (TEAM) - https://team.acgme.org/

Improving Assessment Using Direct Observation Toolkit - https://dl.acgme.org/pages/acgme-faculty-development-toolkit-improving-assessment-using-direct-observation

Remediation Toolkit - https://dl.acgme.org/courses/acgme-remediation-toolkit

Learn at ACGME has several courses on Assessment and Milestones - https://dl.acgme.org/