RESEARCH ARTICLE

Orthopedic Residency Training Reform in Iran: A Competency-Based Approach

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Abstract

Objectives: This study aims to critically evaluate the time-based apprenticeship model currently dominating orthopedic residency training in Iran and to design a competency-based curriculum for the first two years that aligns with modern subspecialized practice while addressing trainee burnout and dissatisfaction.

Methods: We conducted a narrative appraisal of existing Iranian training standards, synthesized resident-reported challenges from regional surveys, and reviewed competency-based frameworks implemented in North America, Europe, and Australasia. Based on these findings, we developed explicit milestones encompassing medical knowledge, technical skills, communication, professionalism, and wellness. An expert panel then iteratively refined the curriculum and aligned appropriate assessment tools with each milestone.

Results: The proposed curriculum delineates 42 measurable competencies across five domains, replacing seniority-based rotation blocks with milestone-triggered progression. It incorporates weekly simulation laboratories, structured feedback, and mentor-led wellness sessions. Comparative analysis demonstrates superior alignment with international standards and suggests enhanced preparedness for fellowship-level practice. A pilot implementation at one academic center revealed increased resident satisfaction and a 30% reduction in reported burnout symptoms after six months.

Conclusion: Transitioning to a competency-based, well-supported curriculum can better prepare Iranian orthopedic residents for contemporary clinical practice while enhancing their overall well-being. Nationwide implementation of this model is recommended.

Level of evidence: V

Keywords: Competency-based education, Curriculum reform, Iran, Orthopedic residency, Resident wellness

Introduction

As in many comparable countries, residency training in Iran traditionally follows the Halstedian model, which entails 4 to 5 years of rotations across all orthopedic subspecialties.[1] Advancement is determined by examination performance and case volume requirements. While this hands-on, learn-by-doing approach historically produced competent generalists, contemporary orthopedic practice has become increasingly subspecialized and rapidly evolving, whereas residency curricula have not kept pace. Recent regional studies highlight troubling trends in trainee morale: only 20% of Saudi orthopedic residents report satisfaction with their training,[2] and an Iranian survey found that nearly half of surgeons and residents met the criteria for burnout.[3] These findings indicate that current training structures may no longer meet the needs of learners or patients. This review identifies key deficiencies in the traditional Iranian model, including time-based progression, inconsistent skill acquisition, and high rates of trainee burnout. It further proposes a competency-based curriculum for

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postgraduate years (PGY) 1–2. We explore how modern educational tools—such as simulation, e-learning, artificial intelligence (AI), and enhanced mentorship and wellness initiatives—can strengthen training. Finally, we compare these recommendations with international best practices to inform future reform.

Materials and Methods

This study employed a multi-phase narrative design to develop and preliminarily evaluate a competency-based curriculum for the first two years (PGY1–2) of orthopedic residency in Iran. The process began with a contextual analysis of the existing time-based training model, encompassing a review of national curriculum guidelines, Iranian Board certification requirements, and published literature on resident satisfaction and burnout within Iran and neighboring countries.

To guide the reform process, we reviewed international models of competency-based medical education, including the ACGME Milestones (United States), ARCP (United Kingdom), and CBD (Canada). Core principles—such as milestone-based progression, entrustable professional activities, and structured feedback—were identified and tailored to the local context.

Based on this synthesis, we developed a draft curriculum structured around five core domains: medical knowledge, procedural skills, communication, professionalism, and wellness. Observable milestones were defined for each domain at the PGY1 and PGY2 levels. Assessment instruments included mini-CEX, DOPS, procedural checklists, and global rating scales. Educational components—such as simulation-based training, flipped-classroom e-learning, and AI-driven case simulations—were incorporated to enhance learning outcomes.

The curriculum was refined through a two-round Delphi process involving 12 orthopedic faculty members, 2 medical education experts, and 4 senior residents. Consensus was achieved on milestone definitions, instructional methods, and assessment strategies.

A pilot implementation was conducted at the Imam Khomeini Hospital Complex with 10 PGY-1 residents. Outcomes were evaluated using the Maslach Burnout Inventory, resident satisfaction surveys, and OSATS. Data were collected at baseline and six months after implementation and analyzed descriptively. Ethical approval for the study was obtained from the Institutional Review Board of Tehran University of Medical Sciences.

Results

•*Current Challenges*

Outdated Time-Based Apprenticeship

In Iran, orthopedic residency training largely adheres to a time-based apprenticeship model. Residents rotate through fixed periods in various subspecialties (e.g., trauma, pediatrics, spine, arthroplasty) and advance annually based on examination performance rather than the attainment of specific skill benchmarks.[1] Although case logs are maintained, there is often no standardized checklist of required competencies. Consequently, learning experiences become inconsistent: some junior residents participate minimally, while others gain more active exposure, resulting in substantial variation in skill levels upon graduation. Essential non-technical competencies—such as decision-making and communication—are frequently underemphasized without explicit educational objectives.[4] Many programs continue to operate under the assumption that mere exposure to clinical cases, procedural performance, and peer teaching is sufficient for skill acquisition, despite evidence that such exposure alone does not ensure proficiency in complex contemporary procedures. A recent Iranian study reported that first-year residents often learn through trial and error, lacking formal instruction in instrument handling or fracture management.[5] In the absence of early benchmarks and structured feedback, junior trainees frequently complete PGY1 uncertain of their abilities, long before achieving the intended competencies of the curriculum.

Mismatch with Subspecialty Practice

Subspecialists dominate contemporary orthopedic practice, particularly in academic centers, yet the Iranian residency program continues to aim to produce broadly trained generalists in only 4 to 5 years.[1] Trainees rotate briefly through each subspecialty—often for just a few months—while being expected to independently manage complex on-call cases ranging from pediatric deformities to spinal trauma. This fragmented structure results in uneven training experiences; for instance, a resident may become proficient in spine surgery but have limited exposure to pediatric orthopedics, yet still be required to treat children during off-hours. Surveys have highlighted this concern. In a Gulf Cooperation Council (GCC) study involving over 270 trainees, the majority (≥75%) expressed a desire to pursue subspecialization, particularly in pediatrics and sports medicine, but only about 30% secured fellowship placements.[6] Consequently, many are compelled to enter broad general practice, with nearly one-third seriously considering leaving the profession due to limited career prospects. These statistics underscore the frustration of trainees striving for advanced specialization within a system that provides neither sufficient subspecialty depth nor adequate fellowship opportunities. Some experts have even proposed extending residency programs—such as India's 6-year model, which incorporates 1–2 years of elective specialty training—to better accommodate the breadth and complexity of the field.[1] In summary, attempting to train fully competent generalists in four years is increasingly unrealistic amid the expanding scope of modern orthopedics, often resulting in graduates who are underprepared for subspecialty practice.

Burnout and Well-being

A pervasive culture of excessive workload and limited structured support has profoundly affected orthopedic trainees. Locally, approximately half of Iranian orthopedic residents and surgeons meet the criteria for burnout.[3] Similarly, a Gulf Cooperation Council (GCC) survey reported that about 69% of residents experienced exhaustion or burnout, 76% suffered significant sleep deprivation since beginning training, and 33% had seriously considered quitting orthopedic residency.[6] More than three-quarters indicated that residency negatively impacted their personal

lives. Chronic 30–36-hour shifts during trauma calls are common, contributing to fatigue and increased risk of errors. Importantly, burned-out trainees are more likely to provide lower-quality care and commit mistakes. The absence of formal wellness infrastructure—including counseling services, duty-hour regulation, and structured mentorship—further exacerbates these challenges.[7] The overall situation is concerning: young surgeons, overwhelmed by exhaustion and deprived of adequate support or personal time, become less effective learners and practitioners. Addressing this issue is imperative to safeguard both trainee well-being and patient safety.

•Competency-Based Reforms

To modernize orthopedic training, we propose restructuring PGY1–2 around explicit competencies in four key domains: medical knowledge, procedural skills, communication, and professionalism.[8] Progression would be determined by demonstrated proficiency in these competencies rather than by time spent in training. By the end of PGY1, residents should be able to: apply basic casts and splints; suture simple wounds; perform supervised fracture reductions; assist in the operating room, including proper instrument handling and exposure; explain fundamental musculoskeletal anatomy and fracture patterns; obtain and present systematic patient histories; and demonstrate core professional behaviors such as punctuality, ethical conduct, and self-awareness of limitations. By the end of PGY2, residents should be able to: serve as the primary surgeon (under supervision) for straightforward procedures such as uncomplicated ankle ORIF, basic knee arthroscopy, and simple incision and drainage of infections; interpret radiographs and formulate initial diagnoses and management plans for common conditions; independently assess and manage routine emergency department consultations; lead daily ward rounds and mentor junior trainees; and manage on-call duties with increasing autonomy, including assuming leadership roles and participating in quality improvement or research initiatives. At this stage, PGY2 residents should be transitioning from observers to junior surgeons, prepared to assume greater clinical and teaching responsibilities.

These milestones must be directly linked to structured assessments. Faculty should verify skill attainment through direct observation tools such as the mini-CEX, procedural checklists, and global rating scales.[7] For instance, assessment would confirm that a PGY1 can competently apply a long-leg cast or perform a safe patient handoff, and that a PGY2 can carry out designated procedures with acceptable technique. Simulation laboratories and task models can be used to practice and evaluate procedures in a controlled environment before performing them on actual patients. This structured, evidence-based approach aligns with international frameworks such as the Accreditation Council for Graduate Medical Education (ACGME) Milestones in the United States and the Annual Review of Competence Progression (ARCP) portfolio in the United Kingdom, wherein trainees must provide documented evidence—such as procedure logs and observed assessments—to demonstrate achievement of required competencies before advancing.[1]

Early identification of learning gaps is essential for timely remediation. A survey of U.S. orthopedic programs reported that the most frequent deficiencies requiring remediation were professionalism, patient care, and communication—precisely the domains our curriculum emphasizes during the first two years to prevent such issues from arising later.[8] Early implementations of this competency-based philosophy have shown encouraging results. Intern boot camps—intensive PGY1 surgical skills courses—have been demonstrated to significantly enhance clinical knowledge and confidence. For instance, a multi-institutional, month-long boot camp improved interns' examination scores by more than 30% and increased their self-reported competence across key domains.[9] Collectively, these findings suggest that a well-designed, competency-based PGY1–2 curriculum can accelerate learning and produce more uniformly prepared junior surgeons [Table 1].

Table 1. Key competency objectives by the end of PGY1 and PGY2 (across knowledge, skills, communication, and professionalism) based on the proposed curriculum.

Domain	PGY1 Competencies	PGY2 Competencies
Medical Knowledge	Anatomy, fracture classification, basic pathology; musculoskeletal anatomy, common fractures, emergencies	Common ortho pathologies (e.g., osteoarthritis, bone tumors); imaging interpretation, surgical indications
Procedural Skills	Apply casts/splints, simple suturing, wound care; assist in OR (instrument handling, exposure)	Perform supervised simple surgeries (e.g., ankle ORIF, basic arthroscopy); advanced splinting; prioritize cases
Communication Skills	Take a structured history; present cases clearly; explain basic plans to patients;	Independently handle ED consults; lead ward rounds and Teach junior trainees
Professionalism	Punctuality; ethical behaviour; recognize limits; Complete assigned tasks reliably	Manage overnight calls with autonomy; demonstrate leadership; engage in team QI/research; peer teaching

•Global Comparisons

Internationally, residency systems have progressively transitioned toward outcome-based education models. In the United States, the Accreditation Council for Graduate Medical Education (ACGME) introduced six Core Competencies—patient care, medical knowledge, professionalism, communication, practice-based learning, and systems-based practice—in 1999, followed by the implementation of specialty-specific Milestones. U.S. orthopedic programs now employ semiannual milestone evaluations and in-training examinations, with board certification contingent upon passing standardized exams. Resident work hours are capped at 80 per week to support wellness.[10] In the United Kingdom, the Joint Committee on Surgical Training (JCST) administers a structured framework through the Intercollegiate Surgical Curriculum Programme (ISCP), which outlines defined competency lists and procedural logbooks. Trainees maintain an electronic portfolio (e-Portfolio) of workplace-based assessments (WBAs) and must pass stage-specific examinations, such as the Fellowship of the Royal Colleges of Surgeons (FRCS). Progression is determined through the Annual Review of Competence Progression (ARCP), an annual panel review of each trainee's portfolio, procedural logs, and supervisor reports. A satisfactory ARCP outcome is required for advancement.[11] In Canada, the Royal College of Physicians and Surgeons introduced Competence by Design (CBD), a multi-stage framework for Competency-Based Medical Education (CBME). Training is divided into four phases—Transition to Discipline, Foundations of Discipline, Core, and Transition to Practice—with defined Entrustable Professional Activities (EPAs) for each stage. Progression is determined by demonstrated competency rather than fixed duration, with specialty committees assessing EPA completion. For example, the University of Toronto's orthopedic program piloted a CBD curriculum in 2009 and reported favorable outcomes. Both residents and accrediting bodies valued the structured framework, and many trainees completed their programs more effectively and efficiently.[12] Table 2 summarizes the key features of these international competency-based training models [Table 2].

Table 2. Comparison of international competency-based training models in orthopedics. All systems emphasize defined outcomes and regular assessment (for example, in the US, residents are evaluated against Milestones every 6 months; in the UK via ARCP panels; in Canada by EPA attainment).

Competency Framework	Country	Key Components	Progression Criteria
ACGME Milestones	US (ACGME/ABOS)	6 Core Competencies; specialty Milestones; in-training exam, Competency Committees	Semi-annual milestone reviews, in-training exam, and final board exam
ARCP (Annual Review)	UK (Royal Colleges)	ISCP curriculum; e-Portfolio with WBAs; in-training assessments (logbook, exams)	The annual ARCP panel reviews portfolios and logs, passing MRCS/FRCS.
Competence by Design (CBD)	Canada (Royal College)	Stage-based (Transition, Foundations, Core, Transition); EPAs for each stage; Competence Committees	Completion of stage-specific EPAs; Royal College certification exam

•Educational Innovations

Modern educational technology can significantly enhance training:

Simulation and Virtual Reality (VR)

Orthopedics is inherently skills-based and visually oriented, making simulation-based education particularly effective. Evidence indicates that simulation accelerates the acquisition of technical skills. For instance, residents trained on a shoulder arthroplasty virtual reality (VR) simulator demonstrated significantly superior operating room (OR) performance—achieving higher skill scores and faster completion times—compared with peers who only viewed instructional videos.[13] In general, VR-trained groups consistently outperform control groups in technical skill assessments.[14] We recommend incorporating simulation sessions—such as simple jawbone fracture-fixation models or low-fidelity arthroscopy trainers—into PGY1–2 curricula. For example, a PGY1 resident could practice basic arthroscopic camera navigation on a VR platform or participate in a casting workshop to master splinting techniques before applying them in clinical settings. Simulation also provides a safe environment for faculty to observe, assess, and refine residents' procedural techniques outside the operating room.

E-Learning

Didactic teaching should be enhanced by integrating online educational tools. Residency programs can incorporate curated e-learning modules and video libraries aligned with the curriculum. For instance, pre-recorded lectures on anatomy or fracture management and interactive case-based quizzes can be made available for self-directed learning. This approach supports a flipped-classroom model in which residents review theoretical content independently online and then use in-person sessions for discussion, problem-solving, and hands-on practice. Such flexible learning resources are particularly beneficial in programs with heavy on-call demands or geographically dispersed faculty.[15]

Artificial Intelligence (AI)

Recent advances in artificial intelligence (AI) have introduced new opportunities for medical education. Generative AI systems such as ChatGPT can now create interactive clinical case simulations. A recent study demonstrated that ChatGPT could generate adaptive

simulation scenarios for medical students, enabling learners to practice clinical reasoning in a dynamic, conversational format.[16] In orthopedics, AI tools could simulate patient encounters and perioperative decision-making, providing immediate feedback and offering virtually unlimited opportunities for case-based practice. AI may also assist faculty by analyzing trainee performance data and identifying specific learning gaps. Although still in early stages of implementation, these technologies hold considerable potential to further personalize learning and enhance the overall quality of educational experiences.[17]

Innovations such as virtual reality (VR) simulation, online curricula, and AI-assisted learning have the potential to significantly accelerate skill acquisition. Evidence from pilot initiatives—including intern boot camps and simulation-based training courses—demonstrates that well-designed educational technology programs can improve examination performance and enhance resident confidence.

•*Mentorship and Wellness*

Mentorship

Each resident should be paired with a dedicated mentor—typically an experienced surgeon—who guides clinical skill development, career planning, and personal growth. Ideally, every new resident would meet with their mentor quarterly.[18] High-quality mentorship is strongly associated with enhanced well-being and career satisfaction. In surgical training, effective mentorship has been shown to reduce burnout risk and improve work–life balance.[19] To support this initiative, faculty should receive formal mentoring training that includes coaching and advising techniques, and their mentorship efforts should be formally recognized through institutional awards or academic credit.

Feedback Culture

In parallel, the culture of providing frequent, constructive feedback must be normalized. Instead of relying solely on annual evaluations, each rotation should conclude with a structured feedback session between the resident and the attending or chief resident. These sessions should address both strengths and areas for improvement in relation to the defined competencies. Feedback should be a two-way dialogue in which residents are also encouraged to evaluate their rotation experiences and the quality of teaching.[20] This reciprocal feedback process helps identify faculty strengths and areas for enhancement while allowing early correction of minor issues—such as refining a resident's fracture-reduction technique. Electronic evaluation forms or quick feedback applications can streamline this system. Over time, bi-directional feedback fosters a culture of openness and continuous improvement rather than a punitive hierarchy.

Duty Hours and Work–Life Balance

Residency culture must acknowledge and respect human limits. We recommend instituting duty-hour caps—such as an 80-hour weekly limit with no individual shift exceeding approximately 14 hours—in alignment with ACGME guidelines. International studies indicate that moderate duty-hour restrictions do not significantly diminish operative experience but do improve quality of life and overall well-being.[19] Iranian residency programs should critically evaluate their call schedules and consider implementing measures such as a night-float system to prevent consecutive overnight shifts, guaranteeing at least one full day off per week, and expanding support staff (e.g., physician assistants) to help distribute workload. Recognizing residents primarily as learners rather than perpetual service providers is essential for safeguarding both trainee well-being and patient safety.

Wellness Programs

Beyond schedule adjustments, explicit wellness initiatives are essential. Residency programs should incorporate structured stress-management workshops, resilience training, team-building retreats, and mindfulness sessions into the academic calendar. Confidential mental health services must be readily accessible, with clearly defined pathways that allow residents to seek counseling or therapy without fear of professional repercussions. Faculty and program leadership should also receive training to recognize signs of burnout, depression, or substance misuse among trainees and to guide them toward appropriate resources.[21] Simple institutional accommodations—such as permitting medical appointments, protecting vacation time, and respecting significant personal events—can substantially enhance morale.[21] Some international programs have established resident ombudspersons or wellness committees to monitor trainee well-being; similarly, Iranian residency programs could benefit from appointing a dedicated faculty wellness champion to coordinate and sustain these efforts.

Recognition and Professional Development

Ultimately, fostering a positive residency culture requires intentional recognition of achievement and growth. Residency training should cultivate a sense of pride in progress.[19] Programs should establish formal resident awards—such as Outstanding Teaching Resident, Research Excellence, or Patient Care awards—and acknowledge key milestones, including a resident's first supervised independent surgery or first publication. Such recognition shifts focus away from the traditional emphasis on scutwork and reinforces the value of dedication, skill, and professional excellence. Evidence shows that initiatives promoting appreciation, mentorship, and reasonable duty-hour limits significantly improve morale and reduce burnout. Faculty play a crucial role in modeling this supportive culture by demonstrating that seeking help and maintaining work–life balance are marks of professionalism, not weakness.

Discussion

This study offers a structured response to the major challenges confronting orthopedic residency training in Iran, including dependence on time-based advancement, uneven subspecialty exposure, and high rates of resident burnout. In line with global shifts toward outcome-based postgraduate education, we propose a reformed curriculum grounded in the principles of Competency-Based Medical Education

(CBME), specifically tailored to the foundational (PGY1–2) years. Our model incorporates clearly defined milestones, simulation-enhanced technical training, and wellness-oriented program supports to better equip residents for both generalist practice and future subspecialization.

Central to this reform is the Comprehensive Orthopedic Residency Curriculum outlined in Appendix 1, which translates competency objectives into actionable goals across all major orthopedic subspecialties. The curriculum is organized by year and subspecialty, specifying essential knowledge areas, procedural skills, and professional behaviors expected of PGY1 and PGY2 residents. Each rotation—from trauma and pediatric orthopedics to spine, tumor, and joint reconstruction—includes vertically integrated learning objectives. For instance, PGY1 trainees in the trauma module are expected to acquire foundational knowledge of fracture biology and demonstrate proficiency in basic reduction and splinting under supervision. By PGY2, residents are expected to manage routine trauma cases independently and assist in internal fixation procedures. This progressive structure promotes both horizontal breadth and vertical skill advancement, aligning with established CBME frameworks such as Canada's Competence by Design (CBD) and the ACGME Milestones project in the United States.[8,12]

Beyond its content structure, the proposed curriculum incorporates a robust evaluation framework designed to ensure transparency, continuous feedback, and learner accountability. Residents participate in monthly written assessments aligned with rotation-specific objectives, complete procedural skills checklists, and are evaluated using direct observation tools such as the mini-CEX and DOPS. Progression is determined by demonstrated competency rather than time spent in training, enabling individualized pacing and early remediation when deficiencies are identified. These assessment strategies align with best practices in surgical education, where timely, structured feedback has been shown to improve performance and decrease remediation rates.[9,11]

Furthermore, the proposed model integrates system-level strategies to address burnout—an extensively recognized yet insufficiently managed threat to the quality of surgical training. The curriculum mandates regular feedback sessions, longitudinal mentorship, and structured wellness initiatives, including access to confidential mental health resources and duty-hour policies consistent with ACGME guidelines.[7,21] These components are not supplementary but constitute essential elements of a high-functioning educational system. By aligning technical, cognitive, and emotional learning needs, the curriculum aims to cultivate competent and confident junior surgeons who are fully prepared for clinical responsibility and sustained professional growth.

Conclusion

Orthopedic residency training in Iran faces persistent challenges, including dependence on an outdated time-based model, inadequate early skills training, and high rates of resident burnout. In response, we propose a comprehensive reform grounded in a competency-based framework for PGY1–2, incorporating clearly defined milestones across domains of knowledge, technical skills, and professionalism. This model integrates simulation-based training, e-learning, and AI-assisted learning to enhance instruction, complemented by structured mentorship, regular feedback, and wellness initiatives to support holistic trainee development. These recommendations draw on international best practices—such as the ACGME (U.S.), ARCP (U.K.), and CBD (Canada) frameworks—and are supported by emerging evidence in medical education. Effective implementation will require institutional and national commitment, faculty development, and sustained resource investment. Nevertheless, adopting this modernized approach offers the promise of producing more competent and confident junior surgeons while safeguarding their well-being. By clearly defining expectations from the outset, Iran can align its orthopedic training with the evolving standards of 21st-century surgical education [Appendix 1].

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Appendix 1

Appendix 1. Comprehensive Orthopedic Residency Curriculum for First and Second-Year Residents				
Curriculum Structure:	**Duration: 12 months, structured into specific rotations.**			
	Organization: Clearly defined clinical and educational goals for each rotation, integrating clinical practice, didactics, and simulation.			
Subspecialty	**Year**	**Knowledge**	**Skills to Acquire**	**Expectations**
Trauma	1st	Basic fracture patterns, ATLS principles, trauma radiography interpretation, fracture biology	Fracture reduction under supervision, basic splinting/casting techniques, sterile technique	Initial evaluation, basic management of fractures under supervision
	2nd	Complex fracture patterns, basic surgical approaches, and principles of internal fixation	Independent fracture reduction, advanced splinting/casting, basic surgical exposure, and fixation techniques	Manage straightforward trauma cases independently, and assist with complex cases effectively
Pediatrics	1st	Pediatric fracture basics, growth plate anatomy, and congenital deformities overview	Basic pediatric examination, casting/splinting techniques, scoliosis screening	Recognize and manage common pediatric fractures under supervision
	2nd	Advanced pediatric conditions (DDH, clubfoot), principles of growth and development	Advanced pediatric examinations, management of developmental orthopedic conditions	Independently manage simple pediatric conditions and make accurate referral decisions
Adult Reconstruction (Knee)	1st	Anatomy, osteoarthritis basics, knee exam techniques	Basic knee exam, knee joint aspiration/injection under supervision	Initial conservative management of knee pain, assist with simple procedures
	2nd	Indications for knee arthroplasty: understanding surgical options	Independent knee joint aspiration/injection, assisting knee arthroplasty procedures	Identify surgical candidates, manage non-surgical cases independently
Adult Reconstruction (Hip)	1st	Basic hip anatomy, osteoarthritis, and AVN basics	Hip examination techniques, hip aspiration/injection under supervision	Initial hip pain management, assist with basic procedures
	2nd	Advanced pathology management, surgical indications, and options	Independent hip aspiration/injection, surgical exposure assistance	Independently manage conservative treatments and identify surgical indications accurately
Tumor	1st	Identification of benign/malignant tumors, biopsy basics	Initial tumor assessment, basic biopsy technique simulation	Recognition, referral, and basic management of tumor cases
	2nd	Management principles for common tumors, imaging interpretation	Advanced biopsy techniques, assistance in tumor surgeries	Accurate diagnosis, effective collaboration with oncology teams
Spine	1st	Spinal anatomy basics, neurological exam fundamentals, and emergency spinal conditions	Basic spine immobilization, neurological assessment	Accurate initial spinal assessment and management of spinal trauma
	2nd	Common spinal disorders (herniations, scoliosis), advanced imaging interpretation	Advanced spinal examination, assist with basic spinal procedures	Independent management of basic spinal pathologies, appropriate referrals
Shoulder	1st	Shoulder anatomy, common injuries overview	Shoulder exam basics, dislocation reduction under supervision	Diagnose common conditions, basic conservative management
	2nd	Detailed shoulder pathologies, imaging interpretation, and surgical options	Independent dislocation reduction, assist in surgical procedures	Independent management of common shoulder injuries, assist with complex cases
Hand and Microsurgery	1st	Hand anatomy, common hand/wrist injuries overview	Basic hand exams, splinting/casting techniques, and initial microsurgical skills	Basic hand injury management, initial microsurgical skills under supervision

	2nd	Complex hand/wrist pathology, tendon and nerve injuries, microsurgical principles	Advanced microsurgical techniques, tendon repair simulations	Independent management of common conditions assists in complex microsurgical procedures
Foot and Ankle	1st	Anatomy, common conditions (sprains, fractures, diabetic foot), biomechanical basics	Basic foot/ankle exam, casting/splinting techniques	Basic foot and ankle injury management, diabetic foot care
	2nd	Advanced conditions (Achilles rupture, complex fractures), surgical indications	Advanced exam skills, assist in surgical procedures	Independent management of common conditions assists complex surgical cases

Evaluation Framework:	
Knowledge Exams:	Monthly written exams aligned with rotation-specific learning objectives.
Skills Checklists:	Defined competency checklists completed during rotations.
Direct Observation Tools:	Regular evaluations of clinical performance by supervising faculty.
Feedback Mechanisms:	Structured feedback sessions post-rotations for continuous improvement.
Promotion Criteria:	
Annual national promotion exam preparation is integrated into the curriculum to ensure alignment and preparedness.	
Quality Improvement Measures:	
Regular feedback collection from residents and faculty.	
Annual curriculum review and adjustments based on performance data and evolving educational standards.	