

The primary care sports medicine fellowship: American Medical Society for Sports Medicine proposed standards of excellence

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ABSTRACT

The American Medical Society for Sports Medicine recognises a need to provide direction and continually enhance the quality of sports medicine fellowship training programmes. This document was developed to be an educational resource for sports medicine physicians who teach in a 1-year primary care sports medicine fellowship training programme. It is meant to provide high standards and targets for fellowship training programmes that choose to re-assess their curriculum and seek to make improvements.

INTRODUCTION

Primary care sports medicine fellowship programmes are designed to provide comprehensive training in preventing and treating musculoskeletal and non-musculoskeletal conditions in athletes and active individuals. A high-quality education should be the goal of all fellowship programmes.

The Accreditation Council for Graduate Medical Education (ACGME) provides the foundation of minimum standards in order to accredit training programmes. However, there are currently no criteria established to describe benchmarks for quality improvement or standards with which to achieve excellence. The purpose of this document is to outline a vision with targets for fellowship programmes to aim for the highest level in their educational training programme.

This is not meant as a requirement list that all programmes must meet to be considered excellent, as every programme will have its own strengths. The goal of this document is to provide guidance and examples of what programmes can do to enhance areas they may choose to improve.

STRATEGIC PLANNING, PROGRAMME PHILOSOPHY AND OVERSIGHT

A programme of excellence should have a written document detailing their mission, vision, values and strategic plan. Fellows, faculty and key stakeholders should be keenly aware of the programme priorities, to be able to concretely describe the impact on educational and service missions.

- A. The programme should be able to define its core values, how they were chosen and how often these are re-examined.
- B. Strategic documents should be re-evaluated every 2 years.
 - I. Strategic goals and objectives should be translated into outcomes/competencies that are measurable (metrics).

- II. The overall plan, metrics and competencies should be communicated to key stakeholders and the sponsoring entity.

- C. The programme should be able to quantitatively and qualitatively describe its impact on the community and local healthcare system, which may assist in obtaining future resources.

- D. Organisational structure

- I. The programme should have an organizational chart of the sponsoring institution, affiliated department and participating sites that include elements of reporting relationships, financial accountability and specific job titles

- II. The program should be able to describe how educational program decisions are made and communicated to those who are vested in the program

- E. Accreditation and affiliation

- I. The sponsoring and participating institutions are responsible for ensuring that all ACGME requirements are successfully met and that there is support necessary for quality assessment and improvement.

- II. The sports medicine fellowship programme must function as an integral part of an ACGME-accredited residency programme in emergency medicine, family medicine, internal medicine, paediatrics or physical medicine and rehabilitation. Some programmes may receive funding from orthopaedic departments, but currently, this specialty cannot serve as a sponsor for primary care sports medicine fellowship programmes.

- III. To avoid conflict and marginalisation, the mission, vision and values of the affiliated department must align with the global direction of the primary care sports medicine discipline.

FACULTY

A programme of excellence will allocate sufficient faculty time for fellow evaluation, mentoring, curriculum design, lecture/conference, scholarly activity, quality improvement, institutional citizenship (Graduate Medical Education Committee and other committee meetings) and programme administration that does not directly generate clinical revenue. Similar to output that is measured with clinical productivity, metrics should be defined for non-revenue, generating full-time equivalent (FTE) at both the individual and group/programme levels.



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A. Programme director

I. Qualifications

- a. The fellowship programme director must be board certified in his primary specialty (family medicine, internal medicine, paediatrics, emergency medicine, physical medicine and rehabilitation) and holds a Certificate of Added Qualification (CAQ) in Sports Medicine.
- b. The programme director should have strong leadership skills and a substantial commitment to education.
 1. The programme director should aim for at least 10 hours of faculty development per year (minimum).
 2. Faculty development can include faculty development seminars within the American Medical Society for Sports Medicine (AMSSM) annual meeting, institutional or other equivalent conferences.
- c. The programme director must be active in sports medicine organisations at the local, state, regional and/or national levels. For example, the programme director may participate in committees within AMSSM or the American College for Sports Medicine (ACSM).

II. Responsibilities

- a. The programme director is responsible for the creation of the educational mission and curriculum, while also articulating the programme philosophy.
- b. The director must be dedicated to the training of the fellow and nurture an environment of professionalism that is culturally sensitive.
- c. The programme director should participate in scholarly activity.
 1. Scholarly activity targets one peer-reviewed publication per year, which could include original research, review articles, book chapters and so on.
 2. The programme director should deliver at least one state, regional or national level presentation per year to peers.
- d. The programme director should have a leadership succession plan.
- e. Fellows should work with the programme director at least one-half day per week providing clinical care.

III. Percent effort

- a. Sponsoring institutions must provide adequate FTE allocation towards the administration, non-clinical teaching, curriculum design, mentoring, quality improvement, scholarly activity and evaluation of the fellowship programme, for which the ACGME designates a minimum of 10 hours/week.
- b. Direct patient care and/or fellow precepting should be no less than 30% of the total FTE allocation to maintain clinical expertise.

B. Associate programme director

I. Qualifications

- a. The associate programme director must be board certified in his/her primary specialty (family medicine, internal medicine, paediatrics, emergency medicine, physical medicine and rehabilitation) and holds a CAQ in Sports Medicine.
- b. The associate programme director should have strong leadership skills and a substantial commitment to education.

1. The associate programme director should aim for at least 10 hours of faculty development per year (minimum).
2. Faculty development can include faculty development seminars within the AMSSM annual meeting, institutional or other equivalent conferences.

- c. The associate programme director should be active in sports medicine organisations at the local, state, regional or national levels, which could include committees within the AMSSM or the ACSM.

II. Responsibilities

- a. The associate programme director should support the programme director in the creation of the educational mission and curriculum and should be able to articulate the programme philosophy.
- b. The associate programme director should assist in clinical teaching, mentoring, advising and didactic education.
- c. Fellows should work with the associate programme director at least one-half day per week providing clinical care.
- d. The associate programme director should participate in scholarly activities.
 1. Scholarly activities target one peer reviewed publication per year, which could include original research, review articles, book chapters and so on.
 2. The associate programme director should deliver at least one state, regional or national level presentation per year to peers.
- e. The associate programme director may be a part of the leadership succession plan for the role of a programme director.

III. Percent effort

- a. Sponsoring institutions must provide adequate FTE allocation towards the administration, non-clinical teaching, curriculum design, mentoring, quality improvement, scholarly activity and evaluation of the fellowship programme, for which the ACGME designates a minimum of 10 hours/week.
- b. Direct patient care and/or fellow precepting should be an expectation of the associate programme director's role.

C. Core sports medicine faculty

I. Number of core faculty

- a. Programme requirements dictate at least two core primary care sports medicine faculty (including programme director) for accreditation.
- b. For each additional fellow (>1), it is recommended that there should be at least one additional faculty member.

II. Qualifications

- a. The core faculty should be board certified in their primary specialty (family medicine, internal medicine, paediatrics, emergency medicine, physical medicine and rehabilitation) and hold a CAQ in Sports Medicine.
- b. The core faculty should be devoted to ongoing faculty/professional development.
 1. The core faculty should aim for at least 10 hours of faculty development per year (minimum).
 2. Faculty development can include faculty development seminars within AMSSM annual meeting, institutional or other equivalent conferences.

- c. The core faculty should be active in sports medicine organisations at the state, regional or national levels.
- III. Responsibilities
 - a. The core faculty should support the programme director in programme and curricular development and be strong in at least one of the four following areas: clinical care, scholarly activity, education or event coverage.
 - b. The core faculty should assist in clinical teaching, mentoring, advising and didactic education.
 1. Fellows should work clinically with each core faculty member at least one-half day per week.
 2. The core faculty should lead or colead educational sessions (eg, didactics, journal clubs, etc) on at least a quarterly basis.
 - c. The core faculty should participate in scholarly activity or quality improvement initiatives, with the target of at least one per year of any of the following: peer reviewed funding, publication of original research or review articles in peer-reviewed journals, chapters in textbooks or presentations (state, regional or national).
 - IV. Percent effort
 - a. Sponsoring institutions should provide adequate FTE allocation towards the administration, teaching, curriculum design, mentoring, quality improvement, scholarly activity and evaluation of the fellowship programme, which by ACGME definition is a minimum of 10 hours/week.
 - b. Clinical sports medicine revenue and non-revenue-producing activities including direct patient care, or fellow precepting should be an expectation of each core faculty.
 - D. Non-core faculty
 - I. Clinicians from sports-related surgical and non-surgical orthopaedic specialties may participate as non-core faculty.
 - a. Ideally, orthopaedic specialists would include: shoulder, elbow, wrist/hand, spine, hip, knee and foot/ankle, paediatrics and potentially other specialties such as trauma and oncology.
 - b. Rotations should include operating room experience, which is an optimal time to perform examinations under anaesthesia and observe proper placement of a blind needle injection.
 - II. Other non-core faculty may include:
 - a. Nutritionists
 - b. Coaches
 - c. Athletic trainers
 - d. Physical/occupational therapists
 - e. Pharmacologists
 - f. Behavioural specialist
 - g. Neuropsychologists specialising in concussion
 - h. Exercise physiologists
 - i. Anatomy and physiology professors
 - j. Bike fit specialists
 - k. Strength coaches
 - l. Adaptive sports medicine experts
 - m. Prosthetist/Orthotist

RESOURCES

The programme must have sufficient resources and support to become a top-tier sports medicine fellowship training programme.

- A. Fellowship programme coordinator
 - I. The fellowship programme coordinator is an essential part of any fellowship programme and assists with duties such as recruitment, on-boarding, annual program reviews and evaluations.
 - II. The fellowship programme coordinator should devote at least 50% FTE towards the programme.
 - III. If the position is shared among other fellowships within the institution, it should only be with one other fellowship programme to minimise the inability to complete critical tasks.
- B. Business administrator
 - I. A business administrator can assist in securing financial stability for the fellowship and any associated clinical productivity that is generated.
 - II. Critical tasks include managing the clinical budget, assuring stable funding and assessing the feasibility of reimbursement models.
 - III. An ideal allocation may include 10% FTE.
- C. Administrative staff
 - I. Administrative staff may provide support for the faculty, the fellows and the fellowship.
 - II. Every faculty member should have access to administrative assistance.
- D. Other resources
 - I. Fellows and faculty should be offered clinical and non-clinical workspace, including one computer and desk per fellow.
 - II. Fellows should have access to a robust online and/or physical medical library.
 - III. Medical information access
 - IV. The clinical setting should have an appropriate Health Insurance Portability and Accountability Act (HIPAA) compliant Electronic Medical Record (EMR).
 - V. An ideal EMR would include the ability to track aggregate patient information for quality improvement initiatives and population health management dashboards.

FELLOW APPOINTMENT

Sports medicine fellowship applicants and programmes should follow a standard set of guidelines for recruiting, interviewing and matching within a fellowship.

- A. Eligibility
 - I. Sports medicine fellows must be scheduled to complete an ACGME-accredited residency in family medicine, paediatrics, internal medicine, emergency medicine or physical medicine and rehabilitation.
 - II. Fellows should submit applications to programmes through Electronic Residency Application System (ERAS), which requires completion of United States Medical Licensing Examination Steps 1, 2 and 3 or the Comprehensive Osteopathic Medical Licensing Examination of the United States Steps 1, 2 and 3.
 - III. Fellows should register and participate in the the National Residency Matching Program (NRMP) and abide by NRMP integrity standards and the AMSSM Code of Ethics.
 - IV. The ideal candidate should have verifiable research, presentation or publication experience.
 - V. Eligible fellows must be able to obtain a state license in the state of the fellowship programme, and it is critical for the programme director to know his/her particular state requirements.

VI. The ACGME's Milestone Handoff from residency to fellowship can be used as a tool to understand the fellow's level of education at the start of fellowship to ensure continuity from previous training. This is now part of ACGME's recommended actions for transitioning between training programmes.

B. Number of fellows

- I. The number of the fellows in a programme should be determined by the adequacy of educational experiences, which would include faculty, clinical/academic capabilities, team and event coverage.
- II. Ideally, the number of fellows is also guided by the availability of faculty in sports medicine, orthopaedics, ancillary staff and subspecialists, as well as expertise in musculoskeletal ultrasound.

CORE COMPETENCIES

A list of competency requirements and expectations for promotion and/or graduation should be given in clear detail at the outset of fellowship training.

A. Patient care: Fellows must be able to provide patient care that is compassionate, appropriate and effective for the treatment of health problems and the promotion of health. Fellows must be able to diagnose and provide treatment (including appropriate referral) of medical illnesses and injuries related to sports and exercise and competently perform all procedures essential to the practice of sports medicine.

I. Clinical experience: The fellowship programme should ensure adequate clinical experience for fellows that would include a variety of presenting complaints, ages, sports, genders, socioeconomic backgrounds, types of sports and levels of participation.

a. Longitudinal experiences

- i. Sports medicine clinic: The sports medicine clinic is the paramount clinical experience during fellowship training and the fellow should work/learn in this setting longitudinally with the target of >800 patient visits.
- ii. Continuity clinic: Sports medicine fellows are required to have a minimum of one-half day per week devoted to clinical care in their primary specialty during fellowship training (minimum target case load >200 patient experiences).
- iii. Training room: During fellowship training, fellows should provide sports medicine care in a training room setting (target >200 patient visits per year).
- iv. Event coverage: Fellows should provide event coverage in a variety of settings during their fellowship year.

- a. Fellows should cover a football team throughout an entire season (high school and college).
- b. Fellows should aim to provide coverage to other contact sports during the fellowship year (lacrosse, soccer, hockey, rugby, etc).
- c. Fellows should cover at least one game in each of a variety of other sports to become accustomed with the athletic environment and potential injuries that could be sustained during the event.
- d. Fellows should provide medical coverage for at least one mass event during their fellowship year, with the goal of being a medical director/codirector for at least one mass participation event during their training.

v. Ultrasound: Fellows should complete the AMSSM recommended sports US curriculum for sports medicine fellowships, plus be given a one-half day per week devoted to US experience.

vi. Preparticipation examination (PPE): Programmes of excellence will have fellows perform PPEs for a variety of athletes (eg, high school, college, special olympics, adaptive athletes). The overall target number of PPEs for the fellowship year should be >150.

b. Monthly rotations

i. Orthopaedics

a. Fellows should have the ability to rotate with subspecialists, including: shoulder, elbow, wrist/hand, hip, knee, foot/ankle and paediatrics surgeons (target 50 patient encounters per rotation).

b. Acute injury and fracture management: Fellowship programmes should offer sufficient exposure to acute fracture and dislocation management including assessment and diagnosis, splinting and casting, referral and follow-up. Fellowships may consider exposure through rotations in the emergency room, urgent care, after game/Saturday morning clinics or winter injury clinics (eg, winter ski clinic).

ii. Specialty rotations: Aside from the traditional orthopaedic rotations, fellowship programmes should look to incorporate monthly or longitudinal experiences with other disciplines such as: sports cardiology, musculoskeletal radiology, PM&R, physical/occupational therapy, exercise physiology and performance, neurology, rheumatology, nutrition and psychology. Meaningful experiences in each discipline would include a target of >25 patient encounters per rotation.

II. Procedural training in sports medicine fellowship programmes

There are no current ACGME procedural requirements for sports medicine fellowship programmes with the exception of the recent addition of ultrasound training. However, since sports medicine procedures are an integral component of most sports medicine practices, they should also be included in this document. Procedural training is also not included in the Sports Medicine Milestones since the milestones are a reflection of the ACGME programme requirements.

Procedural training should include education in four ways: (1) didactic instructional sessions, (2) didactic practice sessions, (3) mentored clinical experience and (4) supplementary and continuing education options.

Direct observation of the fellow's procedural knowledge and technique is critical in determining procedural competency and should be performed to determine proficiency for all procedures.

a. Sports ultrasound

The new ultrasound requirements have not been added to the Milestones and there is no timeline set at this point to do so. It is recommended that programme directors see the AMSSM Recommended Sports Ultrasound Curriculum for Sports Medicine Fellowships published in the following journals:

- British Journal of Sports Medicine. 49:145–150, 2015. doi:10.1136/bjsports-2014-094220

- Clinical Journal of Sport Medicine. 25 (1):23–29, January 2015.
- PM&R. 7(2):e1–e11, February 2015.
- AMSSM Sports Ultrasound Didactics Online. <https://www.amssm.org/UltrasoundOnlineDidactics.php>
- b. Injections

Fellows should aim for competency in the following procedures through palpation (*) and/or ultrasound (^) guidance:

 - i. Subacromial bursa* ^
 - ii. Glenohumeral joint* ^
 - iii. Acromioclavicular joint* ^
 - iv. Sternoclavicular joint* ^
 - v. Biceps tendon sheath* ^
 - vi. Trigger points* ^
 - vii. Elbow joint* ^
 - viii. Medial epicondyle* ^
 - ix. Lateral epicondyle* ^
 - x. Olecranon bursa* ^
 - xi. Wrist joint (Radiocarpal) * ^
 - xii. Carpometacarpal joint thumb* ^
 - xiii. Trigger finger* ^
 - xiv. DeQuervain's tenosynovitis* ^
 - xv. Digital blocks* ^
 - xvi. Carpal tunnel* ^
 - xvii. Sacroiliac joint* ^
 - xviii. Hip Joint ^
 - xix. Trochanteric bursa*
 - xx. Ischial bursitis* ^
 - xxi. Pes anserine bursitis* ^
 - xxii. Pre-patellar bursitis* ^
 - xxiii. Knee joint* ^
 - xxiv. Ankle joint (mortise) * ^
 - xxv. Plantar fasciitis* ^
 - xxvi. First Metatarsal-phalangeal joint* ^
 - xxvii. Sinus tarsi* ^
 - xxviii. Peroneal/posterior tibialis tendon sheath* ^
 - xxix. Interphalangeal joint injections (hands and feet) * ^
 - xxx. Tendinopathy/tenosynovitis (all tendons/sheaths) * ^
- c. Other procedures to consider for general exposure with didactics, journal articles or clinical experiences include:
 - i. Dry needling
 - ii. Autologous blood injections
 - iii. Platelet-rich plasma injections
 - iv. Prolotherapy
- d. ECG interpretation
 - i. Currently, no universal standard for sports cardiology training exists for the sports medicine physician in the USA.
 - ii. Controversy exists regarding the most suitable approach for cardiovascular screening in athletes, which mainly involves the inclusion (or not) of an ECG. Regardless, however, it is critical for sports medicine physicians to be knowledgeable of both the ECG-associated physiological adaptations to regular exercise and the conditions associated with sudden cardiac death.
 - iii. Free online training programmes (<http://learning.bmj.com/ECGathlete>) are available to improve physician education in ECG interpretation and guide secondary testing for ECG abnormalities.
 - iv. Fellows should master and demonstrate sound knowledge of contemporary ECG interpretation standards in athletes (eg, 2016 International ECG Interpretation Standards) through mentored clinical experiences, didactic sessions and/or formal courses.
- e. Exercise treadmill testing

Programmes of excellence will identify ways to provide experiences in exercise treadmill testing (ETT). For fellowship programmes aiming to provide exposure to ETT, performing 10 tests can help solidify objectives such as indications for testing, protocols, limitations and process for interpretation. Those that seek to have their fellows become proficient in ETT must have their fellows perform, interpret and document >50 tests, which is often the threshold for hospital credentialing.
- f. Exercise prescriptions

Writing an exercise prescription is an essential skill for the sports medicine physician. All fellows should feel confident in promoting physical activity in their practice after graduation. Exercise prescriptions can be performed in a number of ways (eg, the FITT (frequency, intensity, time and type) principle for aerobic activity). Fellows should aim to write >25 exercise prescriptions during their fellowship year.
- g. Compartment testing

Compartment pressure testing is a diagnostic technique that can be useful in the management of acute and chronic leg pain. Fellows should complete, interpret and document at least five patient cases and be deemed competent by the programme faculty.
- h. Splinting

Splinting can be performed with a variety of off-the-shelf braces as well as with fiberglass and plaster. Fellows should be competent in immobilising patient's injuries with the following splints:

 - i. Volar wrist
 - ii. Ulnar gutter
 - iii. Thumb spica
 - iv. Sugar tong elbow and ankle
 - v. Posterior ankle
 - vi. Finger—stax/buddy tape/flexion and extension splints
- i. Casting: Fellows should be competent at immobilising patient's injuries with the following casts:
 - i. Long arm
 - ii. Short arm
 - iii. Thumb spica
 - iv. Short leg
- j. Neuropsychological testing:
 - i. Exposure in the administration of neuropsychological testing for concussion management
 - ii. Interpret >10 tests
- k. Laceration repair (aim for competency if not achieved in prefellowship training)
- l. Partial or complete toenail excision (aim for competency if not achieved in prefellowship training)
- B. Medical knowledge: Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioural sciences, as well as the application of this knowledge to patient care.

- I. Fellows must demonstrate a level of expertise in the knowledge of those areas appropriate for a subspecialist in sports medicine. Material that should be mastered includes content that is testable for the CAQ examination, which can be found in the CAQ Sports Medicine Examination Checklist Blueprint (<https://www.theabfm.org/caq/sports.aspx>). Core content areas include:
 - a. Role of the team physician
 - b. Basic science of sports
 - c. Health prevention/preventive aspects of sports medicine
 - d. Emergency assessment and care
 - e. Diagnosis, management and treatment of sports-related injuries
 - f. Musculoskeletal rehabilitation
 - g. Procedures
- II. Fellows may attain medical knowledge through different mechanisms such as: the clinical settings, sports medicine textbooks or journal articles, didactic instruction, grand rounds, AMSSM case studies teaching library, AMSSM ultrasound curriculum videos or local/state/regional/national conference attendance.
- III. Programmes should have a defined didactic curriculum that offers weekly education.
- IV. Fellows can assess their medical knowledge via the fellowship pretest (July/August), the in-training examination (February) and the American Board of Family Medicine Sports Medicine CAQ examination
- V. Educational curriculum organisation
 - a. Didactics/Conferences: The programme should ensure a well-rounded and complete didactic and conference curriculum that exposes the fellows to the full spectrum of sports medicine.
 - I. The weekly didactic curriculum should be structured, well-organised and cover a broad range of topics that mirror the blueprint for the CAQ examination in an effort to prepare the fellow for certification.
 - II. Regular conferences should be a part of the organised curriculum and offer an opportunity for interprofessional education with colleagues of other disciplines such as radiologists, physical/occupational therapists, athletic trainers, orthopaedic surgeons, nutritionists, psychologists, exercise physiologists and other team members.
 - III. Morbidity & Mortality (M&M) conferences are regularly scheduled peer reviews of errors that occurred during patient care.
 - a. The objectives of M&M conferences are to learn from complications and errors, to modify behaviour and judgment based on previous experiences and to prevent repetition of errors leading to complications in a non-punitive way.
 - b. M&M conferences identify areas of improvement and systems issues (eg, outdated policies, mathematical errors, etc) which affect patient care.
 - b. Grand rounds: Grand rounds are an important teaching tool open to a department or medical community and often involves presenting clinical cases, research and new therapies in sports medicine.
 - c. Journal club: Journal club involves the critical review of new (and possibly older, classic) sports medicine literature that may change one's clinical practice and provides fellows with a mechanism to determine the types of articles that could affect practice after graduation. The AMSSM Top 120 Articles (<http://amssm.blogspot.com/p/amssm-100.html>) may be a source for classic articles that could be used for the journal club.
 - d. Seminars/workshops: Seminars and workshops are specific and focused learning times set aside for such matters as ultrasound, sideline preparedness, event planning, casting and splinting, orthotic fabrication, leadership, research, and so on, based on programme resources. Consideration should be made for possible collaboration with other, close-by fellowship programmes with some of these learning experiences.
 - e. Research: Fellows should have a one-half day per week devoted to research and other scholarly activities.
 - f. Regional and national meetings: Sports medicine fellows should attend one local, state or regional conference and at least one national sports medicine conferences that broaden the understanding of the most recent sports medicine practices.
- C. Practice-based learning and improvement: Fellows must investigate and evaluate their care of patients, appraise and assimilate scientific evidence and continuously improve patient care based on constant self-evaluation and life-long learning principles. Fellowship programmes should strive to create an environment that fosters inquiry and practice improvement.
 - I. Fellows must be able to systematically analyse their clinical practice using quality improvement methods and implement changes with the goal of continuous practice improvement.
 - II. Fellows should be able to locate, appraise and assimilate evidence from scientific studies related to their patients' health problems.
 - a. Fellows should be encouraged to use scientific articles to support their diagnosis and management plans when precepting patients to their attending physicians.
 - b. Fellows should participate in journal clubs that occur monthly that provide education on how to critically analyse literature, with the goal of being able to independently perform these types of assessments in practice after graduation.
 - III. Fellows must demonstrate the ability to incorporate formative and summative evaluation feedback into daily practice.
 - a. Fellows should ask for and receive formative feedback on a monthly basis.
 - b. Summative evaluations should be performed on the fellow after each rotation and reviewed with the fellow on a quarterly basis.
 - c. Milestone evaluations should be performed by the Clinical Competency Committee at least every 6 months and reviewed with the fellow by faculty at least bi-annually.
 - IV. Fellows must have access to and be able to use information technology to optimise learning.
 - a. Fellowship programmes must provide fellows access to a physical and electronic library.
 - b. Ideally, fellows would have online access to journals such as the *American Journal of Sports Medicine*,

the *British Journal of Sports Medicine*, the *Clinical Journal of Sports Medicine* and *Sports Health: A Multi-Disciplinary Approach, Current Sports Medicine Reports*.

V. Scholarly activity

- a. Scholarly activity development: The ability to complete scholarly activity within 1 year is often challenging. Thus, directors and fellows may consider project planning prior to entry into the fellowship year and possibly manuscript completion after graduation. Additionally, directors are encouraged to send their fellows to classes or courses on research design and methods. An example would be the AMSSM Fellows Research and Leadership Conference each year in July where fellows can refine project ideas. To meet AMSSM or ACSM deadlines for abstract submission, fellows will need to plan appropriately brainstorm project design, obtain Institutional Review Board approval, perform the project, analyse data and write an abstract.
- b. Faculty scholarly activity: The faculty are encouraged to work with fellows to complete scholarly activity. Faculty who develop an area of expertise are likely to understand knowledge gaps that can be addressed by future projects. An accumulation of publications can assist a faculty member in obtaining promotion from assistant to associate professor and from associate to full professor. Case reports/presentations, grant funding, journal reviews, conference planning and committee work at an institutional/regional/national level are other ways to perform scholarly activity and work towards promotion.
- c. Quality improvement projects: Fellows should complete at least one quality improvement (QI) project during their fellowship year. QI projects can address a variety of areas within sports medicine and are aimed at improving daily practice.
- d. Case reports: The fellowship programme should expose the fellow to a high volume of cases to improve proficiency in musculoskeletal and non-musculoskeletal sports medicine. Fellows should ideally aim to submit at least one case during the fellowship year, which can be presented at a national meeting. Ideally, these cases would be published in a peer-reviewed journal.
- e. Publications: Fellows should aim to publish at least one peer-reviewed (eg, original research, review articles, etc) publication that results from work performed during the fellowship year.
- f. Presentations: Presentations provided at various levels (eg, local, regional or national) may also count towards scholarly activity.
- g. Book chapters: Fellows may aim to complete at least one book chapter during their fellowship year.
- h. Committees: Fellows can join one local/regional/national sports medicine committee to provide service to the broad discipline of sports medicine.

VI. Fellow evaluation

- a. Philosophy: Fellows should be evaluated regularly throughout their fellowship experience. The format should parallel the goals and objectives for each area within the curriculum.
- b. Metrics: Fellows should have evaluations that address the following (when appropriate) in all curricular areas: knowledge, skills, attitudes and behaviours.

- c. 360° perspective: Fellows should be evaluated from a 360° perspective, including staff, patients, residents/students, attending physicians, athletic training staff and any other members of the multidisciplinary team. Evaluations should consider measurements in comprehension and quality of patient care.
- d. Dashboards: Data from a population health management system or electronic health records should be used to create a dashboard for fellows to understand the quality, volume and characteristics of a fellows' patient panel.
- e. Professionalism: The programme should ensure that the fellow appropriately understands and adheres to the values and principles of sports medicine, as well as, the philosophy of the programme. The programme should develop and provide a professionalism agreement that is signed by the fellow at the beginning of the year.
- f. ACGME competencies: The programme should ensure that the fellow is taught and assessed using the ACGME milestones and core competencies.
- g. Interpersonal skills: Observational data assessing the fellow's interaction with patients can be obtained through direct observation or video should be provided so that fellows can improve on their performance. Feedback should be provided in a timely manner to allow for early and continued improvement in performance. A multidisciplinary assessment can be provided with the assistance of a specialist in behavioural science. These behavioural science-related curricula and competencies should be weighted consistently with other curricular entities.
- h. Burnout: The fellowship year can be quite rigorous and demanding. The impact of professional development on a fellow's personal life should be periodically assessed. A healthy balance between personal life and professional endeavors should be encouraged.
- i. In-training assessment: The AMSSM pretest (offered in July/August) and the AMSSM in-training examination (offered in February) are standardised objective measures of evaluation that can assist the programme in designing an individualised educational plan (IEP). Data from these examinations can also be used to evaluate the programme's overall curriculum.
- j. Advising: An IEP should be developed for each fellow and revisited on a regular basis. Each fellow must have an identified advisor (ie, programme director, associate programme director or core faculty), and meetings should occur quarterly to review data from evaluations, previous rotations and upcoming experiences. Meetings should also provide a basis to discuss career planning.
- k. Practice management: Fellows should be assessed in their competence to code, bill and in practice management principles. Assessments can occur via intermittent chart audits or other management of health systems mechanisms.
- l. Final graduate summary: Each programme must provide a final evaluation for each fellow. This summary must attest to the fellow's ability to practice independently, competently and autonomously. The summary document should include an assessment of the fellow's abilities to

practice in settings such as the office, training room and sideline, as well as, proficiency in procedures (listed in Procedural Training in Sports Medicine Fellowship Programs). Additionally, the programme should provide the graduating fellow with supporting information to document their skills, which could assist in credentialing at their future institution. The programme should follow up with graduates to assess the privileges granted based on documentation from both the graduating fellow and the programme.

D. Interpersonal skills and communication: The fellow must demonstrate skills that are effective in the exchange of information and collaboration with patients, their families and health professionals.

I. It is critical for fellows to effectively educate patients, members of patients' families, medical students, residents, coaches, athletes, other professionals and other healthcare professionals (including nurses and allied health personnel) regarding issues related to sports and exercise. Educational materials, such as AMSSM Sports Medicine Today (<http://www.sportsmedtoday.com>) can be an effective point of care tool to assist in the education of patients, coaches, families and other interprofessional team members.

II. Work effectively as a member or leader of a healthcare team or other professional group.

- a. Fellowship programmes should provide didactic sessions on how to effectively manage teams.
- b. At least 10 hours of education per year should be devoted to leadership training and principles.

III. Maintain comprehensive, timely and legible medical records.

- a. At least 10 chart audits should be performed each quarter by the programme to assess the fellows ability to communicate effectively in the electronic medical record.
- b. Feedback from chart audits should be provided in a timely manner so that fellows can incorporate any needed changes.

IV. Teamwork

- a. Fellows must be receiving training in an environment that maximises teamwork among the many caregivers that makes up the sports medicine team.
- b. Fellows must be observed and evaluated and given appropriate timely feedback regarding their communication and leadership skills within the framework of the sports medicine team. This is a critical component of sports medicine systems-based practice education and must be a key component of the regular evaluations and goal-setting meetings held by the programme faculty.

E. Professionalism: Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. In truth, many arenas within fellowship training are lumped into the category of professionalism without concrete examples or process. Ideally, programme directors, faculty and fellows should have a discussion that provides structure and mutual understanding regarding professional standards. The standards should be captured in a professionalism contract that is signed by the fellows and addresses commitments to: self, patients, colleagues, staff, students/residents, fellowship programme, the sports medicine discipline and society. Included in the contract

should also be core principles of excellence, duty, integrity, respect, accountability and altruism.

Professionalism and personal responsibility are hallmarks of fellowship training and are often where remediation is needed in fellowships more than in areas such as medical knowledge or patient care. Professional societies, third party payers and hospitals all require proof of professional conduct as part of the licensing procedure. Fellowships must make the expected behaviours known to fellows on entry into the programme.

I. Transitions of care: Transitions of care have become a more important source of medical errors as the number of transitions have grown with the implementation of duty hour requirements. To ensure patient safety, programmes must require excellence in these transitions even if fellows are not taking hospital call or providing care for hospitalised patients. Programmes should educate fellows on expected handoff methods and policies and monitor and document direct observation of competency in this communication between team members. There are several templates available such as the Illness Severity, Patient Summary, Action List, Situation Awareness and Contingency Planning and Synthesis by Receiver (I-PASS) system.

II. Programmes should provide fellows with clear expectations of call duties for clinic patients and athletic team athlete coverage to ensure continuity of care with the fewest transitions while meeting all fellow duty hour requirements and fellow wellness expectations.

III. Programmes should ensure a back-up system with proper supervision available at all times for fellow clinic time and sports coverage to ensure patient safety. These schedules should be made available to all members of the healthcare team.

IV. Alertness Management/Fatigue Mitigation: On entry into the programme, fellowships should share the programme policies for education on the signs of fatigue/sleep deprivation, alertness management/fatigue mitigation protocols and plans for ensuring patient safety and continuity of care in the event the fellow may be unable to perform his/her duties.

V. Supervision of fellows and clinical progression

- a. Fellows must advance through the four stages of supervision throughout the course of their fellowship programme receiving progressively increased authority and responsibility as skills and knowledge allow.

- i. Direct supervision
- ii. Indirect supervision with direct supervision immediately available
- iii. Indirect supervision with direct supervision available
- iv. Oversight

- b. Fellows should gradually perform an increasing role in resident and student supervision and educational responsibility in recognition of their progress towards independence. These levels of supervision should be clearly delineated in the schedules and curriculum.

VI. Programmes should directly observe and document the fellow's skills on entrance into the programme in all of the core competencies. This can be through simulation, observed structured clinical examination (OSCE), pre-in-training examination testing or with direct patient care.

- VII. The milestones should be filled out as a self-evaluation for the fellow on entrance into the programme and within the first 2 weeks by the faculty. This sets a baseline for an individualised educational plan (IEP) that can be developed with specific learning objectives mutually agreed on by the program director and fellow and eventually modified solely by the fellow identifying specific learning goals as the fellowship progresses.
 - VIII. Programmes must have appropriately credentialed and privileged attending physicians available for fellow supervision and evaluation at all times, and this schedule should be available for all healthcare providers as well as patients informed of these respective roles at all times.
 - IX. The programme director, associate programme director and advisor (if different than programme director or associate programme director) should meet with fellows on a regular basis and at least every 3 months to discuss evaluations, milestone progress, progress towards individual goals and specific learning needs in order to revise IEPs.
 - X. Programmes must develop policies detailing the guidelines for circumstances and events in which fellows must communicate with appropriate supervising faculty members. These policies should be given to and discussed with fellows on entrance into the programme.
 - XI. Clinical responsibilities and progression towards independence should be based on the collective evaluation of the faculty as discussed at regular interval meetings of the Fellowship Clinical Competency Committee.
 - XII. Fellow duty hours: Duty hour requirements have been established with the goal of improving patient safety and improving fellow wellness and preparedness to learn. Fellows should be fit for duty and prepared to provide quality care, and this must be balanced with the fact that on graduation from the programme, fellows must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods of time.
 - XIII. Programmes should have a policy regarding duty hours, and this policy should be presented to and discussed with the fellow on entrance into the programme. The policy should specifically address: the 80-hour work week, a minimum of 1 day free of duty every week (when averaged over 4 weeks), a maximum of 24 hours of continuous duty, no additional clinical responsibilities after 24 hours of continuous in-house duty, effective transitions of care taking no more than an additional 4 hours of time, 8 hours free of duty between scheduled duty periods, no more than six consecutive nights of night float, in-house call no more frequently than every third night and at-home call must count towards the 80-hour maximum weekly hour limit when called into the hospital.
 - XIV. Programmes must have a moonlighting policy, and this policy should be given to and discussed with fellows on entrance into the programme. Moonlighting must not interfere with the ability of the fellow to achieve the goals and objectives of the educational programme. Moonlighting time must be counted towards the 80-hour work week limitation.
 - XV. Programmes should have a policy regarding when fellows can break duty hours, and this policy should be given to and discussed with fellows on entrance into the programme. In unusual circumstances, fellows, on their own initiative, may remain beyond their scheduled period of duty to continue to provide care to a single patient or return to the hospital with less than the expected 8 hours free of duty. Justifications for such extensions of duty are limited to reasons of required continuity for a severely ill or unstable patient (such as a spinal cord injured athlete), academic importance of the events transpiring or humanistic attention to the needs of a patient or family. These instances must be documented and reviewed with the programme director after each occurrence.
- F. System-based practice: Fellows must demonstrate an awareness of and responsiveness to the larger context and system of healthcare, as well as the ability to call effectively on other resources in the system to provide optimal healthcare.
 - I. Fellows must be able to work effectively and coordinate care in various athlete healthcare delivery settings and systems, which include:
 - a. Primary care sports medicine clinic
 - b. Orthopaedic clinic
 - c. Student health clinic
 - d. Training room (eg, high school, college)
 - e. Sideline/event coverage (eg, football game, mass participation event)
 - II. Fellows should also be able to advocate for quality patient care and incorporate considerations of cost awareness and risk-benefit analysis in clinical medicine.
 - a. Fellows should receive instruction in sports medicine billing and coding during a management of health systems curriculum.
 - b. At least 10 hours of time per year should be devoted to sports medicine management of health systems curriculum.
 - III. Fellows should be able to work in interprofessional teams to enhance athlete safety and improve quality of care.
 - a. Fellows should receive 360° evaluations from sports medicine staff, including office staff, athletic trainers, coaches, patients, faculty, and so on, at least twice per year to evaluate the fellows ability to work collaboratively in teams.
 - b. Fellows should aim to take at least one sideline emergency preparedness course during fellowship year to maximise the ability to work effectively in teams in an emergency setting.
 - IV. Participate in identifying system errors and in implementing potential systems solutions.
 - a. Fellows should complete at least one quality improvement project during their fellowship year to assist in identifying possible system errors and implementing solutions.
 - b. Fellows should aim to participate in one committee within the programme, clinic, school or institution that is designed to identify errors within the athlete healthcare system.

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