



Arthroscopy and Orthopaedic Sports Injuries Fellowship AOSIF

**King Saud University
College of Medicine
King Saud University Medical City
King Saud University
Riyadh, Saudi Arabia**

Prepared by:

**Abdulaziz Alomar, MBBS, MSc, FRCSC
Assistant Professor of Orthopaedic Surgery
Consultant Sport Medicine & Arthroscopic Surgeon
Program director, AOSIF
King Khalid University Hospital
Riyadh, KSA**



Orthopaedic Sport Medicine fellowship Curriculum

Table of Contents

• Fellowship committee members-----	4
• Introduction & goals -----	5
• Purpose of the curriculum-----	6
• Objectives -----	7
• Curriculum content -----	13
• Surgical cases logbook-----	15
• Application requirements-----	19
• Structure and rotation -----	20
• Fellows scholarly activitie- -----	21
• Learning resources/place/events -----	22
• Assessment -----	24
• Evaluation -----	27
• Appendices -----	28 - 33

Fellowship committee members

Currently, there are five faculty members. All members are Canadian orthopaedic board-certified (FRCSC) and Orthopaedic Sports Medicine fellowship trained and certified (North America).

1) Dr. Abdulaziz Alomar, MBBS, MSc, FRCSC

Assistant Professor of Orthopaedic Surgery
Arthroscopic & Orthopaedic Sport Medicine Surgeon
Head, Arthroscopy and Sports Medicine Division
Director, Arthroscopy and Orthopaedic Sports Injuries Fellowship
Orthopaedic Department, King Saudi University
Riyadh, KSA

2) Prof. Fwazi Aljassir, MBBS, MSc, FRCSC

Professor of Orthopaedic Surgery
Orthopaedic Sport Medicine & Oncology Surgeon
KKUH, Riyadh, KSA

3) Prof. Abdulaziz Alahaideb, MBBS, FRCSC

Associate Professor of Orthopaedic Surgery
Orthopaedic Sport Medicine & Upper Extremity Surgeon
KKUH, Riyadh, KSA

4) Dr. Ahmed Ben Nasser, MBBS, FRCSC

Assistant Professor of Orthopaedic Surgery
Chairman, Orthopaedic Department
Orthopaedic Sport Medicine & Arthroplasty Surgeon
KKUH, Riyadh, KSA

5) Dr. Sultan Aldosary, MBBS, FRCSC

Assistant Professor of Orthopaedic Surgery
Orthopaedic Sport Medicine & Trauma Surgeon
KKUH, Riyadh, KSA

Orthopaedic Sport medicine fellowship

(GOALS)

Saudi Arabia has an estimated population of 25.7 million; young people participating in sport activities often represent large population. A significant number of young adult and children suffered from sport related injuries (mainly soccer), which necessitate appropriate and sufficient care provided by the orthopaedic surgeons specialized in the field of sport medicine. To accomplish this goal the KSU has approved the AOSIF by 2013 and the fellowship started on October 2014.

The goal of the KSU Sports Medicine Fellowship is to train orthopaedic residency graduates to become outstanding sports medicine surgeons and clinicians. Our aim is to provide a wide range of inpatient and outpatient clinical experience in orthopaedic sports medicine and to increase knowledge and improve medical judgment, surgical skills, and total management of patients with sports medicine problems. We are dedicated to providing a training fellowship program that ensures delivery of the highest quality orthopaedic and sports medicine care to our community. This fellowship will serve as a broad exposure to sports medicine, from injury prevention strategies to injury evaluation to diagnosis to restoration of function through rehabilitation or surgical means. The fellows will gain broad exposure to a variety of surgical skills and procedures like; arthroscopic and open procedures.

Purposes of this Curriculum Map

The purpose of this **map** is to present the **what, how, when and why** of a sports medicine fellowship. The “**What**” relates to the curriculum and depth of knowledge required of the sports medicine fellow at the completion of two years of specialty training. The “**How**” relates to the structure of the fellowship program. The “**When**” applies to the varied educational experiences, which are available in a fellowship program. The “**Why**” applies to the relevance of the curriculum content to sports medicine.

The purposes of creating a detailed orthopaedic Sports Medicine Fellowship Curriculum can be summarized as follows:

1. To provide sports medicine fellowship educators with a strategy and template to bring together many categories of clinical and basic science-related knowledge in order to design the best and most efficacious two-years educational experience.
2. The curriculum identifies in a generic manner the proficiency of a sports medicine fellow in both medical and surgical management of common sport related injuries in KSA.
3. The proficiency expectations in this curriculum map define the ideal educational experience and it is not expected that all aspects of the total curriculum are attainable in a two-years fellowship. The goal is for each fellowship to incorporate approximately three-fourths of the curriculum with yearly updates of the educational experience.
4. To provides a document to be utilized by future fellowship committees to update and modify as education priorities change and new fields of knowledge develop in orthopaedic sports medicine.
5. The curriculum map will be available to SCFHS membership, fellowship applicants and others as a reference providing important information on orthopaedic sports medicine fellowship education requirements.

OBJECTIVES

“Learning outcomes”

The main objective for creating this curriculum map is to provide a core curriculum for a two-years sports medicine fellowship. This fellowship will be a competency-based training. CanMEDS roles will be utilized to structure the objectives of the training. Because this is the first sport medicine fellowship to create in Saudi Arabia, a special attention will be made in order to define and establish the appropriate objectives for medical experts meets the community requirements at Saudi Arabia. Additionally, The Orthopaedic Sports Medicine Fellowship Curriculum and Structure of American Orthopaedic Society for Sports Medicine (AOSSM) will be used to guide us in building the objectives for the medical expert role.

Communicator

The fellow will be able to:

- a) Effectively demonstrate skills as a communicator and work and communicate effectively with other physicians, allied health professionals, patients and families.
- b) Deliver information to the patient and their support group in a way which is understandable.
- c) Demonstrate the ability to describe procedures to the patient and patient’s support group.
- d) The ability to obtain an appropriate informed consent for patients undergoing interventions.

Collaborator

The fellow will be able to:

- a) Show awareness of a team approach to the management of athletic problems involving physician, surgeon, therapist, coach/trainer and nutritionist.

- b) Interacts and consults effectively with all allied health professionals and acknowledges their roles and expertise.
- c) Understand and develop patient care plan with other members of the inter-professional health care team.
- d) Demonstrate the ability to work within an inter-professional team in regards to research and administrative duties.
- e) Delegate appropriately and effectively to other members of the healthcare team.

Manager

The fellow will be able to:

- a) Cost effectively use of investigative tools and therapeutic modalities including complementary and alternative therapies and procedures
- b) Exhibit an ability to effectively organize his/her work and work effectively as part of a team to ensure total and continuing care of his/her patients.

Health Advocate

The fellow will be able to:

- a) Show an ability to act as an effective healthcare advocate for the patient, society, and the community.
- b) Recognize and understands the psychological, social, and physical determinants of patient health.
- c) Identify and advise on risk factors for prevention of injury including issues specific for gender, age and return to activity
- d) Counsel athletes on the risks and side effects of performance enhancing drugs and substance abuse

Scholar

The fellow will be able to:

- a) Develops an ability to critically evaluate and appraise medical literature.

- b) Show an ability and interacts in teaching residents, medical students and allied healthcare workers and patients.
- c) Organize and successfully complete a research project.

Professional

The fellow will be able to:

- a) Display dependability, reliability, honesty and is forthright with patients and colleagues.
- b) Display an understanding and sensitivity to age, gender, culture and ethnicity issues.
- c) Display responsibility and self-discipline and punctuality.
- d) Communicates with patients with compassion and empathy.
- e) Recognizes his/her own limitations and is able to seek and give advice/assistance when necessary.
- f) Understand the principles and practice of biomedical ethics as it relates to sports medicine and minimally invasive orthopedic surgery.
- g) Demonstrate the ability to work within the scope of clinical and technical acumen and obtains responsible and timely patient referrals.
- h) Practice ethically consistent with the obligations of a physician and expectations of the community in regards to gender, culture, ethnicity, race, spiritual values and socioeconomic standard.
- i) Demonstrate the ability to put patient and parents at ease and inspire confidence in the treatment plan.

Medical expert focus content:

1. Knowledge

- **Basic Science: gross anatomy, microanatomy, rehabilitation and kinesiology, pathophysiology, tissue healing, inflammation, and cartilage**
 - Demonstrates knowledge of applied and functional anatomy (e.g., meniscopopliteal ligaments, Buford complex, zona obliquaris)
 - Demonstrates knowledge of the details of rehabilitation protocols and preventive techniques (e.g., ACL reconstruction, concussion, ankle sprains)
 - Demonstrates knowledge of the details of tissue healing and cellular physiology of treatment modalities (e.g., cartilage microfracture, platelet rich plasma [PRP], corticosteroid injections)
- **Musculoskeletal: acute and chronic orthopaedic disorders, acute non-orthopaedic disorders, acute non-orthopaedic traumatic injuries (eye and ear)**
 - Demonstrates full knowledge and preventive measures of MSK conditions in sports medicine (e.g., training biomechanics, braces, taping)
 - Demonstrates knowledge of intervention techniques to prevent reinjures
 - Demonstrates knowledge of surgical indications and variables associated with surgical timing in athletes and non-operative management of the in-season athlete
 - Demonstrates complete knowledge of etiology, pathophysiology, treatment, and prevention of complications
 - Demonstrates knowledge of more advanced imaging studies for MSK conditions
 - Demonstrates full knowledge of routine and accessory portal placements and associated complications

- **Medical Issues: cardiopulmonary, skin, heat/cold intolerance, concussions, gastrointestinal (GI)/GU, and gender-related**
 - Demonstrate full knowledge and preventive measures of medical conditions in sports medicine (e.g., nutrition/supplements)
 - Demonstrates knowledge in controversies and complications of medical conditions in sports medicine
 - Demonstrates full knowledge in return to play guidelines for common medical conditions in sports medicine (e.g., *H. gladiatorum*, mono, concussions)

2. Clinical skills

- **Non-operative: history and physical examination, imaging interpretation, common medical issues treatment and referral**
 - Independently provides patient care in all aspects of sports medicine conditions
 - Manages all musculoskeletal aspects and acute sports medicine injuries
 - Refers medical sports medicine conditions to specialists (e.g., recurrent concussions, hyphema, cardiomegaly, eating disorders) appropriately
 - Correlates imaging studies with clinical findings

3. Operative Skills

- Performs all steps for primary reconstruction of the knee, shoulder, and ankle (see the surgical cases logbook)
- Performs common revision reconstruction for the ACL, anterior shoulder, and lateral ankle
- Performs surgical repair and reconstructive techniques for the hip, and ankle (e.g. hip labral and femoroacetabular impingement [FAI] treatment)
- Recognizes, corrects, and avoids potential intra-operative complications

4. Working with inter-professional teams (consultants, certified athletic trainer, physical therapist, occupational therapist, etc.) to enhance athletic care and safety

- Maintains a team approach and has situational awareness to the care of the athlete
- Incorporates clinical quality improvement and athletic safety into clinical care
- Contributes to the reduction of risks of errors and promotes "speaking up" with concerns by members of the inter-professional team

Curriculum's contents

The AOSSM fellowship committee has established the ideal topics need to be covered during the fellowship. These topics represent the core curriculum for the sport medicine fellowship ideal curriculum. However, to address the gaps in the taught curriculum's contents, a prioritizing, categorizing and identifying the type of knowledge and surgical skills required is considered important during preparing the curriculum's content.

A. Types of knowledge are required for surgical practice

Fundamentally, there are three types of knowledge: 1) knowing what (declarative knowledge), 2) knowing how (procedural knowledge), and 3) knowing when and why (conditional knowledge). Often confusing and potentially problematic for orthopaedic education is the relationship between knowing how (procedural knowledge) and being able to deal proficiently with a particular type of injury or illness. Command of all three types of knowledge is required for surgical practice. Procedural knowledge (i.e. knowing the steps one is to follow in doing a particular procedure) and being able to implement the procedure proficiently are both important in orthopaedic sports medicine.

B. Prioritizing Levels of Knowledge, clinical and surgical skills For Curriculum

It was realized that the graduate of a fellowship program should handle certain difficult and sports medicine cases in a highly proficient manner; others routinely and still others only well enough to make a responsible referral. Similarly, graduates should possess an in-depth understanding of certain types of knowledge from the basic sciences because of their importance to the practice of sports medicine, while other optionally relevant knowledge, which is not essential to this subspecialty, may be known at only a minimal level.

The rating used in this curriculum applies functional ratings to topic areas. The curriculum is designed to separate: 1) Topics which should be mastered by all fellows

(rating of “A”) with increasing proficiency and with increasingly complex and challenging issues and problems during the fellowship. 2) Topics (rating “B”) in which fellows are not expected to become proficient during the fellowship (rather they may assist experts in managing such cases for which diagnosis and treatment procedures have only been partly developed by the field). 3) Topics (rating “C”) pertaining to aspects of orthopaedic sports medicine for which fellows are to learn to triage, since the topics are in “unknown territory” from the perspective of orthopaedic sports medicine. Diagnosis and treatment of such cases is typically left to the other experts. Table 1 shows some examples in how the content of the curriculum will be prioritized.

C. Contents categories:

AOSSM curriculum topics will be utilized in this curriculum while some minor adjustment regarding the categorizing and prioritizing of the topics in order to address the preexisted gaps in this area. The contents of the curriculum focusing in medical expert competency will cover all of surgical and medical aspect of sport medicine. Topic will organize to cover the major joints of the body. Every topic related to the single joint will be categorized in to three main categories: basic science, clinical, and surgical knowledge and skills. In addition to that, the curriculum will include topics about medical aspect of athletes’ health and sport medicine. Table 2 shows some examples of the topics need to be covered in the curriculum

Surgical Cases Logbook

The AOSIF created a case Logbook for Orthopaedic Sports Medicine allows fellows to document their operative experience during the 24-month educational program and enables the fellowship Committee to monitor programs to ensure that fellows have an adequate volume and variety of experiences appropriate for fellowship education. The Committee has identified defined case categories (listed here on the following pages) as appropriate for the focused education of orthopaedic sports medicine fellows.

To log a case, fellows will continue to identify the patient type (adult or pediatric), and must also identify their role in the case as either Level 1 (primary or supervising fellow surgeon) or Level 2 (assisting fellow surgeon). All procedures at both levels require appropriate faculty member supervision and participation in the case. At this time, both Level 1 and Level 2 participation will count. The fellowship committee will continue to review the fellows' Case Log reports as a measure of the depth and breadth of fellow experience.

GLENOHUMERAL INSTABILITY

1	Diagnostic arthroscopy
1	Arthroscopic OR open anterior capsulorrhaphy; with labral repair (e.g., Bankart procedure)
2	Arthroscopic OR open anterior capsulorrhaphy; with bone block
2	Arthroscopic OR open anterior capsulorrhaphy; with coracoid process transfer
2	Arthroscopic OR open posterior capsulorrhaphy, with or without bone block
2	Arthroscopic OR open Glenohumeral joint capsulorrhaphy for multi-directional instability
2	Arthroscopic repair of SLAP lesion

ROTATOR CUFF

1	Arthroscopic OR open decompression of subacromial space with acromioplasty, with or without coracoacromial ligament release
1	Arthroscopic OR open repair of acute ruptured musculotendinous cuff (e.g., rotator cuff)
1	Arthroscopic OR open repair of chronic ruptured musculotendinous cuff (e.g., rotator cuff)
2	Reconstruction of chronic massive rotator cuff tear
1	Arthroscopic OR open tenodesis of long tendon of biceps
1	Tenotomy of long tendon of biceps

ACOMIOCLAVICULAR INSTABILITY

1	Arthroscopic distal clavicle resection
1	Open distal clavicle resection
1	Open treatment of acromioclavicular dislocation, acute or chronic; with or without tendon graft reconstruction (includes obtaining graft)

HIP ARTHROSCOPY

2	Diagnostic hip arthroscopy, with or without synovial biopsy
2	Diagnostic hip arthroscopy; with removal of loose body or foreign body
2	Diagnostic hip arthroscopy; with debridement/shaving of articular cartilage (chondroplasty), abrasion arthroplasty, and/or resection of labrum
2	Diagnostic hip arthroscopy; with synovectomy

KNEE INSTABILITY

1	Primary repair of torn collateral ligament
2	Primary repair (ORIF or arthroscopically) of avulsed cruciate ligament (ACL or PCL)
2	Ligamentous reconstruction (augmentation) of PLC
2	Ligamentous reconstruction (augmentation) of the collateral ligaments (MCL/LCL)
1	Arthroscopically aided anterior cruciate ligament reconstruction
2	Arthroscopically aided posterior cruciate ligament reconstruction

KNEE MULTI-LIGAMENT REPAIR AND RECONSTRUCTION

2	Open treatment of knee dislocation, with or without internal or external fixation; with primary ligamentous repair or augmentation/reconstruction
2	Arthroscopic treatment of knee dislocation with multiple ligaments reconstruction

KNEE OSTEOTOMY

1	High tibial osteotomy for correction of genu varus
1	Distal femur osteotomy for correction of genu valgus

PATELLOFEMORAL INSTABILITY

1	MPFL reconstruction
1	Reconstruction of dislocating patella; with extensor realignment and/or muscle advancement or release
1	Reconstruction of dislocating patella; with tibial tubercle and/or distal femur osteotomy osteotomy
1	Arthroscopic lateral retinacular release
1	Arthroscopic or open treatment of acute patella dislocation with osteochondral fracture+ ORIF or removal+ MPFL and medial retinacular repair

KNEE ARTICULAR CARTILAGE

- 1 Arthroscopic debridement/shaving of articular cartilage (chondroplasty)
- 1 Arthroscopic microfracture
- 2 Arthroscopic/ open allograft osteochondral transplantation for OCD
- 2 Arthroscopic/ open osteochondral autograft transplantation (e.g., mosaicplasty) (includes harvesting of the autograft(s))
- 1 Arthroscopic drilling for osteochondritis dissecans with/without bone grafting, with or without internal fixation (including debridement of base of lesion)

MENISCUS

1	Arthroscopic partial, subtotal or total meniscectomy (medial OR lateral including any meniscal shaving)
1	Arthroscopic meniscus all-inside repair (medial OR lateral)
2	Open meniscus repair inside-out or out-in (medial OR lateral)

FOOT AND ANKLE

1	Open or percutaneous primary repair ruptured Achilles tendon
1	Open repair of chronic ruptured Achilles tendon with graft reconstruction
1	Acute repair of superior peroneal retinaculum and deepening of the fibular groove for dislocating peroneal tendons
1	Groove-deepening with soft tissue transfer and/or osteotomy for chronic dislocating peroneal tendons
1	Primary repair/ reconstruction of disrupted lateral collateral ankle ligament
1	Arthroscopic excision of osteochondral defect of talus and/or tibia, including drilling
1	Open or Arthroscopically aided ORIF of large osteochondritis dissecans lesion, talar dome fracture
1	Arthroscopic ankle joint debridement
1	Arthroscopic removal of loose body or foreign

Application requirements

Candidate for this fellowship will be an orthopaedic fellow who successfully finished his/her residency-training program. A total of two fellows will be accepted in this fellowship.

The following documents are required:

- KKUH Orthopaedic Sports Medicine Fellowship Application
- Current curriculum vitae
- Three letters of recommendation
- Saudi Orthopaedic Board Certificate or equivalent.

Structure & Rotation

The fellowship is two years in length. The program begins on March 1st and terminates on February 29. Fellows will spend the two-year in doing different rotations to cover most aspect of sport medicine. Currently we have five surgeons with different expertise area in different sport medicine subspecialties (shoulder + upper extremities, and Knee+ lower extremities).

Most of the Fellowship is a one-on-one learning experience. This is accomplished by assigning the Fellow to two of the sports medicine attending staff. While with this attending, the Fellow's schedule mirrors the both attending staff's schedule which is two days a week in the clinic, two days a week in the operating room, and one day free to pursue research and prepare for conferences. This allows a very close exposure to the attendings' thought processes regarding clinical evaluation and test ordering, decision making in the clinic, preoperative counseling and preparation, intra-operative decision making and post-operative decision making involving wound care, precautions, physical therapy and activity progression. This exposure to the continuity of care for the athletic patient care is important in the fellowship program.

Elective rotation:

Each fellow will have a chance to do an elective rotation (3-6 months) outside the KKHU. Fellow can conduct this rotation only at accredited sports center with a qualified sports medicine surgeon who is the arthroscopy and sports medicine represent at least more than 80% of his practice.

Fellows' Scholarly Activities

The KSU institution and AOSIF program will allocate all adequate educational resources to facilitate fellow involvement in scholarly activities

Each fellow must demonstrate scholarship through at least one of the following activities:

1. Participation in sponsored research;
2. Preparation of an article for a peer-reviewed publication;
3. Presentation of research at a regional or national meeting; **OR**,
4. Participation in a structured literature review of an important topic.

As part of their educational experience, all fellows are required to perform a clinical or laboratory research project (at least ONE) during the 2 years of training.

Completion of one scholarly activity is MUST and MANDATORY.

Learning resources, place, and events

Learning resources:

During the training and in addition to the formal teaching, fellows will have the chance to get a free access to the educational resources, which are rich of educational materials specifically related to sport medicine. Details of the learning resources are shown on table 1.

Learning places and events

For orthopaedic surgeons to gain proficiency in sport medicine, an appropriate setting for efficient learning and teaching is fundamental. Competency in surgical arthroscopy and sport medicine typically develops during completion of the residency curriculum as defined by the residency review committees, with standard of care as defined by community norms. Additional training is often provided by focused fellowships in arthroscopy and sports medicine. Therefore, a careful planning of teaching to address gaps around residency teaching and exposure to sport medicine is crucial and should be well planned.

In addition to learning and teaching take place at the operative room, clinics, and attending international or local conferences and meetings, a structured and well planned formal learning, which will be conducted through the two years curriculum.

- Weekly combined residents and fellows Case-Based Teaching:
 - Teaching will take place at conference room.
 - Supervised by the teaching faculty.
 - Fellows will participate in preparing the clinical cases and teaching.
 - Time protected teaching, where the fellows will be freed from any clinical and surgical duties.

- Sport medicine rounds:
 - Weekly at the conference room.
 - Will be prepared and organized by chief residents and fellows and supervised by teaching faculty.
 - Only difficult and more challenging cases will be discussed.
- Journal club meeting:
 - Monthly at one of the attending staff's house or at the restaurant.
 - Scope of teaching will be focus on research methodology, athletes' population, and basic science research related to sport medicine.

- Simulation lab:

Traditional orthopaedic training in arthroscopy and sport medicine surgical skills has relied heavily on the apprenticeship model in which fellows observe experienced surgeons in the operating room and increase their level of involvement with subsequent procedures. This method of learning is inefficient in terms of both time and cost, and it is associated with patient morbidity. These concerns illustrate the limitations of the current system and demonstrate a rationale for improving the acquisition of technical skill outside the operating room. Therefore, alternative education tools like simulation (cadavers, bench top model, and virtual reality) will be utilized in this fellowship.

Assessment

Purpose: The purposes of the assessment during the training are to:

- Support learning
- Develop professional growth
- Monitor progression
- Competency judgment and certification
- Evaluate the quality of the training programs

General Principles:

- Judgement should be based on holistic profiling of a trainee rather than individual traits or instruments
- Assessment should be continuous in nature
- Trainee and faculty must meet together to review portfolio and logbook once every two months and at the of a given rotation
- Assessment should be strongly linked to the curriculum and the content

Type of assessment:

- **Formative:**
 - Self-assessment MCQ exam by AOSSM
 - Continuous assessment including the workplace-based assessment
 - 360-degree/Multi-source feedback
 - Peer
 - Nurse
 - In-Patient nurses
 - Out-Patient nurses
 - ER nurses

- OR nurses
- Patients
- Other health professionals
 - ER physicians
 - Physiotherapists
- Faculty
- Case-Based Discussion (CBD)
- Portfolio and logbook
- Direct observation:
 - Mini clinical evaluation exercise (Mini-CEX)
 - DOPS
 - Non Operative Technical Skills for Surgeons (NOTSS)
- **Summative:**
 - The final Fellowship certificate exam will be conducted yearly. It will consist of a minimal 120 MCQs. Fellow who successfully completes the 2 years triaging will allow setting for the exam.

In addition to the other CanMEDS role, there are three major components of surgical competence need to be addressed during assessment: cognitive factors (including ability to take decisions), personality traits (including ability to communicate), and technical skills. Therefore, the ideal assessment tools will be used in this fellowship need to address knowledge, surgical skills, and attitude change of trainee. Both formative and summative assessment will be the purpose of assessment in this fellowship.

Assessment of surgical trainees' knowledge acquisition and application for both basic science and clinical will be addressed by a written examination. The sport medicine

exam, which is conducted yearly by AOSSM as a formative test, and it is a combination of MCQs and key feature questions and cover both basic science and sport medicine topic. It is useful assessment tool for assessment of non-technical surgical skills, like communication, knowledge, and problem solving which constitute a major component of surgical competency. The fellows will have the chance to do the exam twice a year, at the beginning and at the end of the fellowship. The main purpose of the test is for formative assessment. However, the pre- and post-test result can be used for the program outcome evaluation purpose. Additionally, other assessment tools like chart audit & case based discussion will be utilized thoroughly to help in assessing both clinical skills and surgical decision and to help fellows to reflect their own practice.

The objective structured assessment of technical skills (OSATS) and direct observational of operative skills (DOPS) are reliable and valid tools can be used to assess the technical surgical skills. A previously published and validated evaluation model for assessment of Arthroscopic skills will be utilized. As written exam, the OSATS will conduct twice a year at the same time with the written sport medicine exam to give a feedback to the fellows and to use as pre- and post-test for program evaluation purpose.

To help in assessment of the other CanMEDS role, fellows will be advised to use a portfolio. Portfolios include documentation of and reflection about specific areas of a trainee's competence. Portfolios demonstrate a trainee's development and technical capacity. They can include chart notes, referral letters, procedure logs, videotaped surgery, peer assessments, patient surveys, literature searches, quality-improvement projects, and any other type of learning material.

CERTIFICATION

Certificate of training completion will only be issued upon the fellow's successful completion of all program requirements. Candidates passing all components of the AOSIF requirements awarded the "Orthopaedic Sports Medicine Fellowship" certificate

Program evaluation

Both process and outcome evaluation are crucial in planning this fellowship. The main purpose of fellowship evaluation is to be used as an ongoing management and learning tool to improve the training and fellowship's effectiveness and to determine whether the fellowship program is effectively carrying out planned activities and learning outcomes. The Five steps Task-Oriented Conceptual Model of Program Evaluation will be utilized in evaluating this fellowship. The details of the evaluation process of the fellowship are demonstrated in figure 1.

Learning resources

Basic Science Knowledge	Surgical and Clinical knowledge	Surgical skills
<ul style="list-style-type: none"> • Textbooks: major sport medicine textbooks will be available at library for the fellows. • Journals: a free accesses to the following journals <ul style="list-style-type: none"> - JBJS (journal of bone and joint surgery) - AJSM (American journal of sport medicine) - CJSM (clinical journal of sport medicine) • Websites: a free accesses for the following website <ul style="list-style-type: none"> - AOSSM (American Orthopaedic Society for Sports Medicine) - AAOS (American association of orthopaedic surgery) - OKO (orthopaedic knowledge online) • Conferences and meeting <ul style="list-style-type: none"> - AAOS - AOSSM - Review courses 	<ul style="list-style-type: none"> • Rounds • Clinics • Textbooks • Journals • Audiovisual media 	<ul style="list-style-type: none"> • Operative room • Simulation lab <ul style="list-style-type: none"> - Cadaver - Animal - Bench top model - Virtual reality • Media resources (video of surgical procedure) <ul style="list-style-type: none"> - VuMedi - OKO - AAOS

Table 3: Learning resources for sport medicine fellowship

	Prioritizing Levels of Knowledge For Curriculum		
	A	B	C
Basic science knowledge	Comprehensive and excellent working knowledge as to the basic science field.	Overall understanding and general knowledge of the basic science field.	Minimal understanding of the basic science field.
Clinical knowledge and skills	Fellow learns to be capable of managing routine orthopaedic sports medicine diagnostic and treatment problems. During the training period, the fellow shows increasing judgment and proficiency to manage increasingly complex problems.	Fellow has experience in assisting and participating with sports medicine experts in management of complex problems; however, the fellow does not directly manage or learn all aspects of the particular problem.	Fellow triages and leaves management to other experts, the fellow possesses only a general understanding and familiarity of the problem.
Surgical knowledge and skills	Fellow develops all necessary surgical skills and techniques to manage a routine surgical problem or case. During the training period the fellow shows increasing proficiency and psychomotor skills.	Fellow has experience in assisting and participating with sports medicine experts in complex surgical cases in this area, however, the fellow does not develop all of the necessary surgical skills to perform the surgical procedure with proficiency or manage all of the potential intra-operative problems. The fellow may develop initial surgical skills in a particular sub-specialization, which are expanded and further developed after the fellowship.	Fellow triages and leaves management and surgical treatment to other experts, possesses only a general understanding and familiarity of the problem.

Table 1: shows the prioritizing levels for basic science, clinical and surgical knowledge and skills.

Shoulder Joint	Knee Joint	Medical Aspects of Sports Medicine
<p>1. GLENOHUMERAL</p> <p>a. Ligament (IGHL, MGHL, SGHL, labrum)</p> <p>i. Basic science</p> <ol style="list-style-type: none"> 1. Tendon anatomy 2. Mechanical Aspects of Injury 3. Tendon Repair and Healing 4. Clinical Effects on Tendon <p>Repair</p> <p>ii. Clinical - instability</p> <ol style="list-style-type: none"> 1. Classification of injury/disease 2. Traumatic 3. Instability <ol style="list-style-type: none"> a. Direction b. Degree c. Timing d. Acute/chronic e. Frequency 4. Inflammatory 5. Evaluation 6. Management <ol style="list-style-type: none"> a. Non-operative b. Unidirectional c. Anterior d. Posterior e. Inferior f. Multidirectional <p>iii. Surgical</p> <ol style="list-style-type: none"> 1. Operative (open/arthroscopic) <ol style="list-style-type: none"> a. Unidirectional b. Anterior c. Posterior d. Inferior e. Multidirectional <p>b. CARTILAGE</p> <p>c. TENDON</p> <p>d. MUSCLE</p> <p>e. BONE</p> <p>f. NERVE</p> <p>g. VESSEL</p> <p>2. AC joint</p> <p>3. Scapulothoracic joint</p> <p>4. Sternoclavicular joint</p>	<p>1. Tibiofemoral joint</p> <p>a. Ligament (ACL, PCL, MCL, LCL, posterolateral structures)</p> <p>i. Basic science</p> <p>ii. Clinical</p> <ol style="list-style-type: none"> 1. Classification of injury/disease 2. Evaluation 3. Management <ol style="list-style-type: none"> a. Non-operative <ol style="list-style-type: none"> b. Isolated <ol style="list-style-type: none"> i. ACL ii. PCL iii. MCL iv. LCL/posterolateral c. Combined injuries d. Dislocated knee e. Arthritis/instability <p>iii. Surgical</p> <ol style="list-style-type: none"> 1. Isolated <ol style="list-style-type: none"> a. ACL b. PCL c. MCL d. Posterolateral 2. Combined injuries <ol style="list-style-type: none"> a. ACL/medial b. ACL/lateral c. PCL/medial d. PCL/lateral 3. Dislocated knee 4. Arthritis/instability <p>b. Meniscus</p> <p>c. CARTILAGE</p> <p>d. TENDON</p> <p>e. MUSCLE</p> <p>f. BONE</p> <p>g. NERVE</p> <p>h. VESSEL</p> <p>2. Patellofemoral</p> <p>3. Proximal tibia/fibula joint</p>	<ol style="list-style-type: none"> 1. Cardiac 2. Dermatology 3. Pulmonary 4. Infection 5. Nutrition <ol style="list-style-type: none"> a. Eating disorders b. Hydration c. Anabolic steroids d. Nutritional supplements e. Ergogenic aids 6. Drug testing/banned substances 7. Environmental exposure <ol style="list-style-type: none"> a. Hypothermia b. Heat injuries c. Altitude sickness d. Decompression sickness 8. Exercise Physiology <ol style="list-style-type: none"> a. Response to exercise b. Fitness level c. Training d. Adaptation e. Motor skills f. Performance factors 9. Athletic Populations <ol style="list-style-type: none"> a. Female athletes b. Disabled athletes c. Aging athletes 10. Pediatric and Adolescent Issues in Sports 11. Preventative Sports Medicine <ol style="list-style-type: none"> a. Pre-participation guidelines b. Rules of sports c. Protective equipment 12. Sports-Specific Trauma <ol style="list-style-type: none"> a. Eye, ear, mouth, and face b. Head: concussion, closed head injury c. Chest d. Abdomen e. Genito-urinary <ol style="list-style-type: none"> i. Male/Female 13. Protective Equipment Including Braces

Table 2: shows some examples of sport medicine topics need to be covered in The curriculum.

Orthopaedic sport medicine fellowship evaluation plan



