Musculoskeletal Curriculum

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CONTENT DOMAIN: BASIC SCIENCE				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
PATHOPHYSIOLOGY OF TISSUES/ORGANS									
Understand the basic organization of tissue types, with an emphasis on the following aspects of the structural elements below. Know the effect of aging, training, medications, hormones, drugs, nutrition, and therapeutic interventions on these structural elements.									
Skeletal Muscle									
Muscle cell/ fibers, including their types, arrangement/composition.	X			X					
Muscle contraction, including action potentials, role of actin and myosin, calcium and acetylcholine.	X			X					
Determinants of strength and response to training and disuse.	X					X			
Strains, including types.	X					X			
Tendons									
Basic structure, including paratenon.	X			X					
Blood supply and healing.	X			X					
Collagen: types, arrangement, cross-linking.	X			X					
Elastin: fibroblastic response; metabolic rate of tendon.	X					X			
Golgi tendon organs.	X			X					
Bone									
Bone cells and their function, including osteocytes, osteoblasts, and osteoclasts.	X			X					
Basic structure and function of cortical vs trabecular bone.	X			X					
Blood supply for high risk fractures: femeral head, scaphoid, navicular.	X					X			
Normal vs abnormal bone formation, including response to stress and inborn errors.	X					X			
Growth plates.	X					X			
Ligaments									
Basic composition.	X			X					
Healing rate of sprains.	X						X		
Strains, including types.	X			X					

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Nerves									
Neuronal structure, including axon vs dendrites.	X			X					
Fasicular organization, including epineurium, perineurium, endoneurium.	X			X					
Schwann cell.	X			X					
Neuron type, including small vs large, myelinated vs unmyelinated.	X			X					
Neuromuscular transmission: pre-synaptic vs post-synaptic, modulators of membrane potential.	X				X				
Nerve cell injury, including neuropraxia, neurotmesis, axonotmesis.	X				X				
Understand the effect of nerve injury on return to play, the role of EMG/ NCS findings, ultrasound vs MRI findings, bracing, protective devices, surgical vs non-surgical considerations.	X						X		
Fascia									
Basic composition.	X				X				
Functional significance.	X				X				
FUNDAMENTAL BIOMECHANICAL PRINCIPLES									
General Biomechanics									
Compare and contrast isometric vs isotonic vs isokinetic resistance exercises and how they may be implemented in a rehabilitation program.	X					X			
State the difference between concentric and eccentric muscle contractions.	X			X					
Discuss differences between “open” vs “closed” kinetic chain exercises, give examples of each.	X				X				
Describe the indication/role for each type of exercise.	X					X			
Summarize passive, active assisted, and active range of motion.	X			X					
Compare and contrast dynamic vs static stretching. Review the most appropriate time to stretch, pre- or post- exercise.	X					X			
Lower Limb Biomechanics									
Outline the motion planes (sagittal, coronal and transverse) and range of motion for each of the following joints: hip, knee, ankle, foot and first MTP.	X			X					
Identify the ideal neutral stance position, including alignment of the weightbearing line through the lower limb.	X					X			
Point out biomechanical differences between walking and running, including foot contact, stance and swing phase, vertical ground reaction force, and joint.	X						X		
List the six determinents of gait foot contact, stance and swing phase, vertical ground reaction force, and joint.	X				X				

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Outline how to counsel patients regarding footwear, including fit, general structure, motion control properties, cushioning, and wear patterns.	X	X					X		
Explain how suboptimal lower limb biomechanics may lead to injuries.	X	X					X		
Explain how biomechanical abnormalities may be managed with orthotics, taping, or bracing.	X	X					X		
Determine the biomechanical differences that may predispose female athletes to noncontact anterior cruciate ligament injuries and how teaching appropriate jumping/landing techniques may prevent them.	X	X					X		
Describe the biomechanics of cycling, including proper seat height/position for the cyclist and how improper height/position can lead to injury.	X	X						X	
Upper Limb Biomechanics									
State the range of motion for each of the following joints: shoulder, elbow, wrist, and hand.	X			X					
Characterize the biomechanics of the shoulder.	X						X		
Describe the phases of throwing with involved muscle activity, including wind-up, early cocking, late cocking, acceleration, deceleration, and followthough.	X						X		
Explain the kinetic chain of throwing, including contributions from the legs, trunk, shoulder girdle, and upper limb.	X	X					X		
Describe common biomechanical abnormalities demonstrated in pitching and how these may lead to injuries of the shoulder and elbow. Describe which types of injuries most commonly occur in each phase.	X							X	
List common technical errors in specific swimming strokes that are thought to be risk factors for shoulder injury.	X	X						X	

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
FOUNDATIONAL SCIENCE									
Review the pharmakinetics, indications, contraindications, common side effects, interactions and manage the following:									
NSAIDS/Cox-2 Inhibitors (including lithium interaction)	X	X		X					
Corticosteroids	X	X		X					
Acetaminaphine and Other OTC Meds	X	X		X					
Muscle Relaxers	X	X			X				
Neuropathic Agents	X	X			X				
Antihypertensives	X	X		X					
Asthma medications	X	X			X				
Viscosupplementation	X	X				X			
Antibiotics	X	X		X					
Opiates	X	X			X				
Antidepressants	X	X			X				
Osteoporosis medications	X	X				X			
Be familiar with:									
Herbal supplements including glucosamine, tumeric, CBD oil	X					X			
Topicals	X					X			
Cannabinoids	X					X			
Manage drug-induced problems such as: steroid-induced myopathies, drug-induced myalgias (i.e., statins), eosinophilic reactions such as medication-induced eosinophilic myalgia, drugs with potential photosensitivity reactions, potential banned substances.	X	X						X	
MEDICATIONS COMMONLY USED IN SPORTS MEDICINE									
Outline the common banned substances in competitive sports, such as may be found on the "NCAA Banned Drugs" list, as well as those which require declarations of use rather than therapeutic use exemptions (TUE).	X						X		
For each class of medication describe the mechanism of action, appropriate use, and common and severe adverse medication effects. Additional objectives below.									

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Non-steroidal anti-inflammatory drugs (NSAIDs)									
Identify the primary mechanism of NSAIDs action for reduction of pain and inflammation.	X			X					
Name medications that can be administered in conjunction with NSAIDs to reduce likelihood and severity of some of the common adverse effects associated with NSAID use.	X			X					
Discuss a potentially severe electrolyte abnormality which can be associated with NSAID use.	X			X					
Describe the role of NSAID administration in association with muscle contusion.	X						X		
Explain why NSAID use may be more appropriate during the acute phase of injury recovery but may be contraindicated in later stages.	X						X		
Relate the role of topical NSAIDs.	X					X			
Injectables									
Explain the side-effects and risks associated with injection of corticosteroids.	X					X			
State the role and efficacy of injectable corticosteroids in conditions typically encountered in sports medicine (e.g., acute injury, osteoarthritis, chronic tendonopathy).	X					X			
Characterize different formulations and administration schedules available for injectable hyaluronic acid, as well as risks and benefits of each.	X					X			
Review foundational concept and physiology of regenerative techniques, such as tenotomy, prolotherapy, prp, and stem cell treatments.	X					X			
Explain indication, contraindication, risk, and cost associated with regenerative techinques, such as tenotomy, prolotherapy, prp, and stem cell treatments.	X						X		
Perform regenerative techniques such as tenotomy, prolotherapy, prp, and/or stem cell treatments.	X	X						X	
Asthma Medications									
Identify the sports which have the highest prevalence of exercise induced bronchospasm (EIB).	X						X		
Explain the role of short- and long-acting β-agonists, as well as other classes of asthma medications (leukotriene receptor antagonists, mast cell stabilizers, etc.) in the management of EIB.	X						X		
Recognize common detrimental effects β-agonists can have on performance.	X							X	
Identify which inhaled β-agonist combinations are permitted by the NCAA versus those permitted by the World Anti-Doping Agency (WADA).	X							X	
Cardiovascular Medications									
Explain why diuretic agents should be avoided or used only with caution in athletes, explicating potential adverse side effects and their potential use for illicit purposes.	X						X		
Express why β-blockers are prohibited in certain precision sports (e.g., archery). Explain how β-blockers may adversely affect athletic performance (cardiac output, VO2max, cardiac output, fuel use, thermoregulation, skeletal muscle recruitment patterns), and understand the role of selective β-blockers.	X						X		
Given the potential problems with diuretics and β-blockers, propose alternative anti-hypertensive medications that may be a better choice in athletes.	X						X		
Identify the most significant potential risk associated with using statins in athletes.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Antibiotics usage in athletics									
Recognize the potential risks of prescribing fluoroquinolones for athletes.	X				X				
Name the first-line agents for treatment of community acquired methicillinresistant Staphylococcus aureus (CA-MRSA).	X						X		
Explain how treatment of CA-MRSA can contribute to the development of infectious diarrhea.	X			X					
Outline the role of decolonizing agents in the management of CAMRSA.	X				X				
Stimulants									
List stimulant medications commonly used to treat ADHD.	X					X			
State the advantages athletes may derive from stimulant medications and restrictions on their use as proscribed by the International Olympic Committee (IOC) and the WADA.	X						X		
Oral contraceptive pills (OCPs)									
Explain the role of OCPs in the treatment of menstrual irregularities associated with the female athlete's triad.	X						X		
Summarize the role of OCPs in potentially reducing the risk of stressfractures.	X						X		
Recognize the potential severe adverse/life-threatening side-effects associated with OCP use, as well as those which may affect performance.	X						X		
Allergic rhinitis									
Identify first-line treatments for allergic rhinitis.	X			X					
Define restrictions on medications such as pseudoephedrine and other over-the-counter treatments which athletes may use as self-treatment for symptoms associated with allergic-rhinitis.	X						X		
Doping control									
Review the varying agencies (Word Anti-Doping Agency [WADA], United States Anti-doping Agency, USADA, NCAA), which monitor and govern the use of illicit substances by athletes, including the sports-specific anti-doping organizations.	X						X		
List the requirements for a valid therapeutic use exemption (TUE).	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
ORTHOTICS IN SPORTS									
For each general category of orthoses, describe the indications and cost of commonly used types.									
Shoulder Orthoses, including sling and swaths, shoulder immobilizer, and clavicle strap.	X	X					X		
Hand/Finger Orthoses, including thumb spica orthosis, neutral wrist orthosis, and ulnar gutters orthosis.	X	X					X		
Knee Orthoses, including a neoprene knee sleeve, patellar tracking orthosis, stabilizing knee orthosis, and off-loading knee orthosis.	X	X				X			
Ankle Orthoses, including a functional ankle brace (such as ankle stabilizing orthosis), stir-up ankle orthosis (such as air-cast), and compression ankle sleeve.	X	X					X		
Foot Orthoses, including a metatarsal pad, heel lift, medial or lateral heel wedge, and carbon fiber, and steel shank insert.	X	X				X			
INTEGRATIVE SPORTS MEDICINE									
Describe the role of the physician in promoting physical activity and demonstrate the ability to write an appropriate exercise prescription for individuals across the spectrum of age, ability, and wellness.	X	X				X			
Acupuncture									
Compare and contrast traditional vs contemporary acupuncture in terms of its goal and techniques.	X								X
Shock Wave Therapy									
Explain the basic science of this modality.	X						X		
Homeopathy and Herbal Remedies									
Note those remedies that have been the most widely studied, as well as those that might be used for performance enhancement.	X							X	
Discuss the role of the naturopathic practitioner in sports and rehabilitation medicine.	X							X	
Manipulation									
Disclose the risks and complications associated with high velocity manipulation.	X					X			
Massage Therapy									
Outline the different types of massage therapy.	X					X			
Alexander Technique									
Describe the role of the Alexander teacher and a basic lesson in this technique.	X								X

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Yoga									
Delineate the most popularly practiced types of yoga.	X								X
Describe how the Eastern aspects of yoga distinguish it from Western athletic and rehabilitation approaches.	X								X
Discuss possible complications of yoga.	X								X
Tai Chi/ Chi Gong									
Relate the theories behind these practices as they relate to exercise and mental health.	X								X
Feldenkrais Method									
Describe a typical lesson.	X	X						X	
Rolfing									
Explain how this method specifically targets the fascia, and describe the similarities and differences to massage therapy and traditional physical therapy.	X						X		
NUTRITION/ METABOLISM IN SPORTS									
Energy Metabolism									
Describe the concept of energy balance including total energy expenditure, resting energy expenditure, physical activity, and thermal effect of food.	X						X		
List the components that derive the universal source of metabolic fuel in the body (ATP) and the three energy systems used in muscular activity.	X					X			
Discuss the effects of aging on energy expenditure (resting metabolic rate and thermic effect of foods).	X						X		
Explain the typical order of fuel consumption and its impact on athletic performance.	X						X		
Nutritional needs for athletes									
For each condition describe the nutritional requirements of carbohydrates, protein, fat, and micronutrient intake:									
General training.	X						X		
Endurance athletes.	X						X		
Ultra-endurance athletes.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Hydration and fluid replacement									
Define dehydration and the potential causes of dehydration. Identify the effects on effort, performance, and balance control.	X						X		
Choose the best way to evaluate a hydration program.	X							X	
State the amount of fluid intake recommended before, during, and after exercise.	X						X		
Identify the fluid recommendations if exercise lasts more than 1 hour.	X						X		
Explain the effects of aging, medications and medical conditions, such as diabetes mellitus, on hydration status.	X						X		
Discuss the effects of hydration on heat illness and the expected levels of dysfunction associated with declining hydration.	X						X		
Nutrient timing									
Identify the three phases of nutrient timing, and the recommended ingestion of nutrients during each phase.	X							X	
Break down the recommended doses and examples of carbohydrates and protein snacks to enhance recovery from vigorous or endurance and resistance exercises.	X							X	
Selected Nutritional Issues									
Identify the optimal time and ideal glycemic index for a pre-exercise meal.	X						X		
Define carbohydrate loading and identify differences in performance with carb loading vs. high fat/low carb diet.	X						X		
Recognize the different forms of eating disorders and their impact on athletic performance, bone mineralization, and menstruation.	X						X		
Discuss the impact of low calorie meal consumption on weight loss and the impact of starvation mode on desired weight loss.	X						X		
Diabetes									
Discuss the impact of nutrition and exercise on diabetes mellitus, including risk of increased weight, hypoglycemia and hyperglycemia. Describe how the effects of nutrition impact type I diabetes vs type 2 diabetes.	X					X			
Explain the effects of overeating associated with insulin receptor upregulation.	X			X					
Summarize the effects of the glycemic index of foods on the diabetic athlete.	X						X		
Fractures									
Discuss the nutritional risk factors that inhibit bone healing.	X					X			
Report the role of nutrition in fracture management and recommended doses of calcium and vitamin D to promote bone healing.	X					X			
Differentiate the recommended doses of calcium for women based on their age/ menopausal state.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Distinguish between Non-Functional Overreaching (NFOR) and Overtraining syndrome (OTS)									
Identify the clinical and hormonal signs and symptoms of each disorder.	X	X					X		
Point out possible markers for the detection of OTS.	X						X		
Discuss the impact of eating disorders on sport performance and effect on body systems.	X						X		
Nutritional supplementation									
Identify the dose of creatine to maximize muscle mass and enhance energy and discuss the length of a typical washout period.	X						X		
Compare the positive and negative effects of creating as it relates to athlete performance and weight gain.	X						X		
Recognize the role and daily dose of caffeine in performance enhancement and potential side effects.	X						X		
Explain the uses and components of a sport drink vs an energy drink. Discuss the positive and negative aspects of these drinks as they relate to hydration, glucose, and sodium balance and carbohydrate, protein and fat metabolism.	X						X		
Explain the risks associated with the use of nutritional supplements as they relate to drug testing in sport.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
CERVICAL SPINE REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate. Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X		X					
b. Demonstrate familiarity with radiographs of the cervical spine.	X	X			X				
c. Demonstrate familiarity with advanced imaging of the cervical spine including CT, PET, bone scan and MRI.	X	X				X			
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and neck stretching and strengthening exercises for patients who sustain a cervical spine injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			
Cervical Herniated nucleus propulsis									
Identify clinical presentation of cervical disc herniation with nerve root compression.	X			X					
Localize nerve root with associated cervical disc herniation.		X			X				
Recognize the rationale and limitations of each imaging modality.						X			
Cervical Strain and Sprain						X			
Describe the origins, insertions, actions, and innervations of the cervical muscles.	X				X				
Name the ligaments of the cervical spine and explain how each contributes to the static stability of the cervical spine.	X				X				
Describe the role of imaging with flexion-extension radiographs.	X					X			
Discuss the role of cervical orthoses in the acute management of cervical strains.	X					X			
Ligamentous Injury/ Instability								X	
List the radiologic criteria for instability on flexion/ extension radiographs.	X					X			
Break down the specific consideration for patients with Downs Syndrome and rheumatoid arthritis including the role of screening radiographs and restriction from specific activities and treatments.	X					X			
Describe Klippel-Feil syndrome and the role of imaging and considerations for sports participation for these patients.	X							X	
Cervical Spinal Stenosis								X	
Describe the clinical presentation of patients with spinal stenosis.	X				X				
Demonstrate how to calculate the Torg/Pavlov ratio, and the uses and limitations of this measurement.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Cervical Fractures									
Discuss the osseous anatomy of the cervical spine.	X				X				
Describe mechanism and management of each of these specific fractures to the cervical spine: Jefferson fracture, posterior arch fracture of C1, Hangman's fracture, Odontoid fractures (types I-III), Vertebral body compression fractures (type I-V).	X	X				X			
Transient Quadriparesis/Cervical Cord Neuropraxia						X		X	
Describe the typical clinical presentation, mechanism, incidence, and recurrence rate of transient quadriparesis.	X						X		
Identify the considerations related to return to play for patients with a single episode compared to repeated episodes of transient quadriparesis.	X						X		
Cervical Radiculitis/Radiculopathy									
Recall the neuroanatomy of the cervical spine, spinal nerve roots, and brachial plexus.	X				X				
Describe the typical presentation based on root level involvement.	X					X			
Point out the expected electrodiagnostic findings of a cervical radiculopathy at 1 week, 3-4 weeks, 5-6 weeks, and greater than 6 months.	X					X			
Contrast the electrodiagnostic findings of cervical radiculopathy with those observed with a nerve root avulsion or burner/stinger.	X	X				X			
Identify the indications for a cervical epidural steroid injection and for surgical interventions.	X					X			
Burners/ Stingers								X	
Describe the typical mechanism of transient neuropraxia of the brachial plexus (burners/stingers).	X					X			
Review the estimated incidence of this injury among football players and which nerve roots are most often affected.	X					X			
Explain the role for, including the appropriate timing of, electrodiagnostic studies for evaluation and prognosis for a burner/ stinger.	X					X			
Summarize the typical treatment and the considerations for role of return to play.	X						X		
Cervical Facet Arthropathy									
Identify the most commonly affected joints of the cervical spine and describe their typical pain referral pattern.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Cervical Zygapophyseal (Facet) Joint Procedures.		X						X	
Cervical Epidural Injections.		X						X	
Cervical Region Trigger Point and other Intramuscular Injections.		X				X			
Stellate ganglion block.		X							X
Botulinum toxin.		X						X	
Occipital nerve blocks.		X				X			
SHOULDER REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate. Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X				X			
b. Demonstrate familiarity with radiographs of the shoulder.	X	X				X			
c. Demonstrate familiarity with advanced imaging of the shoulder including MRI, MRI-Arthorgrram, and ultrasound.	X	X					X		
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and stretching/stabablizing and strengthening exercises for patients who sustain a shoulder injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			
Scapular Dyskinesis and Scapular Winging									
Identify the scapular stabilization muscles and describe their role in optimizing scapulothoracic function.	X					X			
Discuss the relevance of evaluating kinetic chain mechanics and sport specific technique in an athlete with shoulder pain.	X							X	
Compare and contrast the presentations and causes of lateral vs medial scapular winging.	X					X			
Acromioclavicular (AC) Joint Sprains									
Describe the structure of the AC joint and the classification of AC injury (I-VI).	X					X			
Review which classes of AC joint sprains require a surgical consultation.	X					X			
Shoulder Instability and Dislocation									
List the typical causes and presentations of anterior, posterior shoulder dislocation, and Multi directional instability (MDI).	X					X			
Break down potential associated conditions, including Bankart and Hill-Sachs lesions and neurovascular injury.	X					X			
Describe a clinical approach to the hypermobile athlete.	X						X		
Explain the risk of recurrence for first time shoulder dislocations in the young athlete.	X					X			

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CONTENT DOMAIN: REGIONS				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Rotator Cuff Tendinopathy, Rotator Cuff Tears, Calcific Tendinpathoy, and Shoulder Impingement Syndrome									
Identify the rotator cuff muscles and discuss their function.	X			X					
Describe the mechanism of and contributing factors to impingement.	X					X			
Review the natural history of rotator cuff tears and clacific tendinpathoy, and indications/ contraindications for surgical intervention.	X					X			
Bicipital Tenosynovitis, Tendinopathy and Proximal Biceps Tendon Rupture									
Outline biomechanics of bicips tendon injuries and its affect on rehabilitation.	X					X			
Identify the bicip tendons using ultrasound.	X	X				X			
Labral Pathology, including SLAP Lesion									
Characterize the structure and function of the glenoid labrum.	X				X				
Describe the mechanism of and contributing factors to labral pathology.	X					X			
Review the natural history of labral tears and indications/ contraindications for surgical repair.	X						X		
Adhesive Capsulitis									
Distinguish adhesive capsulitis from other shoulder problems and describe its typical course.	X				X				
Report the difference between primary and secondary adhesive capsulitis.	X					X			
List associated co-morbilies at increased risk.	X				X				
Glenohumeral (GH) Arthritis									
Describe the structure and function of the GH.	X			X					
Discuss the mechanism of and contributing factors to GH pathology.	X					X			
Review the natural history of GH arthritis and indications/ contraindications for surgical intervention.	X					X			
Treat post surgical recovery and complications, including persistent pain and neuropathay and post arthroplasty pain syndroms.	X	X							X
AC Arthritis									
Describe the structure and function of the AC Joint.	X			X					
Discuss the mechanism of and contributing factors to AC pathology.	X					X			
Review the natural history of AC arthritis and indications/ contraindications for surgical intervention.	X					X			
Treat post surgical recovery and complications, of SAD, Distial clavicle resection.	X	X						X	

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Nerve Entrapment									
Discuss the most common nerve entrapments affecting the should girdle and inlcuding the clinical presentation and management.	X					X			
Constrast the clinical presentation for the suprascapular nerve entrapment at the various locations and associated shoulder pathology.	X					X			
List common etiologies of axillary nerve injusry and clinical presentation.	X					X			
Fractures of the Shoulder Region									
Discuss typical fractures of the shoulder region and any associated cliassifications.	X								X
Special Topics/Populations									
Identify populations at risk for HO, AVN, Charot.	X					X			
Descrbe the typical clinical and radiological presentation and treatment options.	X	X				X			
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Subacromial Injection.		X				X			
Bicipital Tendon Sheath Injection.		X					X		
GH Joint Injection.		X					X		
AC Joint Injection.		X						X	
Suprascapular Nerve Block/RFA.		X							X
Shoulder Joint Reduction.		X						X	
Sholder tenotomy/lavage.		X							X
Trigger point injections.		X				X			
Botulimum toxin injection.		X				X			
ELBOW REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate. Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X				X			
b. Demonstrate familiarity with radiographs of the elbow.	X	X				X			
c. Demonstrate familiarity with advanced imaging of the elbow including MRI, MRI-Arthorgrram, and ultrasound.	X	X					X		
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and stretching/stabablizing and strengthening exercises for patients who sustain a elbow injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Elbow Conditions. For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate. Additional objectives are below.									
Lateral Epicondylitis/osis									
Name the most commonly involved muscle.	X				X				
Describe the different treatment algorithms for acute epicondylitis versus chronic lateral epicondylosis.	X					X			
Discuss the most recent literature on injections and their short-term versus long-term efficacy.	X						X		
Medial Epicondylitis/osis									
Identify the most commonly involved anatomy.	X				X				
Describe the different treatment algorithms for acute epicondylitis versus chronic lateral epicondylosis.	X					X			
Discuss the most recent literature on injections and their short-term versus long-term efficacy.	X						X		
Olecranon Bursitis									
Compare and contrast the differences between acute and chronic olecranon bursitis.	X					X			
Distal Biceps Tendon Rupture									
Describe the most common mechanism of this injury.	X							X	
Contrast management treatment options between proximal and distal injuries.	X							X	
Triceps Tendinitis									
Discuss the most common causes and what preventive measures should be undertaken to decrease risk of recurrence.	X						X		
Ulnar Collateral Ligament (UCL) Injury of the Elbow									
Discuss the anatomy of UCL and surrounding structures.	X					X			
Describe the biomechanical importance of the UCL in relation to overhead throwers.	X						X		
Review the gold standard imaging modality to diagnose this injury.	X						X		
Explain what preventative measures are used to decrease risk of this injury.	X						X		
Valgus Extension Overload Syndrome (VEOS)/ Posterolateral Rotatory Instability									
Discuss the overhand pitching cycle and review the phases and events of throwing.	X						X		
Explain the biomechanical importance of the UCL ligament in relation to overhead throwers.	X						X		
Describe the differences between VEOS and an UCL disruption.	X							X	

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Medial Epicondylar Apophysitis (Little League Elbow)									
Cite the importance of rest and pitch restrictions and explain how this impacts adolescent elbow throwing injuries.	X						X		
State the order of epiphyseal closure of the growth plates in the adolescent elbow, with ages.	X						X		
Anterior Interosseous Nerve (AIN) Syndrome									
Review the AIN innervated muscles.	X					X			
Predict the common signs and symptoms of AIN Syndrome.	X					X			
Pronator Syndrome									
Review the median intervated muscels and discuss the potental sites of compression of the median nerve.	X					X			
Predict the common signs and symptoms of pronator Syndrome.	X					X			
Posterior Interosseous Nerve (PIN, i.e Radial Tunnel) Syndrome									
Review the PIN innervated muscles.	X					X			
Predict the common signs and symptoms of PIN Syndrome.	X					X			
Cubital Tunnel Syndrome									
Describe the type of elbow fractures associated with this type of nerve injury.	X					X			
Discuss activities and postitioning that are commonly associated with cubital tunnel syndrome.	X					X			
Elbow Dislocations									
Describe the importance of neurovascular examination with traumatic elbow injuries.	X				X				
Recall the classification scheme of elbow dislocations.	X								X
Differentiate between simple vs complex dislocations.	X							X	
Radial Head Subluxation (Nursemaid's Elbow)									
Explain the mechanism of injury and why the size of the radial head diameter plays a role.	X					X			
Describe treatment for acute and reocurring injuries.	X						X		
Osteochondritis Dissecans of the Elbow									
Identify the typical location of OCD of the elbow.	X							X	
Differentiate the treatment algorithm in displaced vs nondisplaced lesions.	X							X	
Determine the difference between OCD of the elbow and Panner's Disease (see Pediatric Sports Medicine section).	X							X	

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Volar Compartment Syndrome (Volkmann's Ischemia)									
Review the fractures that are associated with this syndrome.	X								X
Discuss the most common of the 6 "P's" associated with this injury.	X								X
Explain why this type of injury is a potential surgical emergency.	X								X
Fractures of the elbow									
Describe typical fractures of the elbow and any associated cliassifications.	X								X
Report radiographic findings asscociated with common fractures of the elbow.	X					X			
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Elbow Joint Injection and/or Aspiration.		X					X		
Olecranon Bursa Aspiration and/or Injection.		X				X			
Lateral Epicondylitis/osis Injection.		X				X			
Medial Epicondylitis/osis Injection.		X					X		
elbow tenotomy/lavage.		X							X
Trigger point injections.		X				X			
Botulimum toxin injection.		X				X			
Nerve block/hydrodisection.		X							X
WRIST/ HAND REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate. Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X				X			
b. Demonstrate familiarity with radiographs of the wrist/hand.	X	X				X			
c. Demonstrate familiarity with advanced imaging of the wrist/hand including MRI, MRI-Arthorgrram, and ultrasound.	X	X						X	
d. Describe an appropriate rehabilitation program including activity modification, functional restoration, stretching, stabablizing and strengthening exercises for patients who sustain a wrist/hand injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X							X	
Tendon/Cartilage Injury									
DeQuervain's Tenosynovitis	X					X			
Identify the involved muscle/tendon units. Review the contents of each dorsal wrist compartment.									

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Intersection Syndrome									
"Identify the involved tendons. Explain the clinical difference between this syndrome and DeQuervain's Tenosynovitis."	X					X			
Mallet Finger and Jersey Finger									
Explain the mechanisms of injury.	X					X			
Outline what is seen on clinical examination in each case.	X					X			
Explain the treatment algorithm and justify non-surgical management versus surgical management for each.	X					X			
Trigger Finger									
Review the natural history of this syndrome and the cause of the mechanical catching.	X					X			
Discuss treatment options, including collagenase injections.	X					X			
Boutonniere Deformity									
Describe the mechanism of injury, what structure is injured, and the treatment algorithm in acute and chronic (i.e., > 6 weeks) cases.	X					X			
TFCC Injury. Describe the mechanism of injury									
Explain the clinical importance of positive versus negative ulnar variance and how it relates to the Triangular Fibrocartilage Complex (TFCC).	X							X	
Ligamentous Injury. 1st MCP Ulnar Collateral Ligament (Skier's or Gamekeeper's Thumb)									
Review the mechanism of injury and explain why it is important to image the injury prior to stressing the thumb.	X					X			
Define a Stener lesion, recognize on radiograph, and explain how the presence of one can change treatment decisions.	X						X		
Nerve Entrapment									
Discuss the most common nerve entrapments affecting hand and wrist, including the clinical presentation and management.	X					X			
Constrast the clinical presentations for the median, ulnar, and radian nerves at the common entrapment sites.	X					X			
Common Dislocations-IP									
Outline the most common mechanism of injury for DIP and PIP dislocations.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Ganglion Cysts									
Point out the most common location to find this cyst.	X				X				
Describe the treatment algorithms for conservative and operative management, and imaging modalities to confirm diagnosis.	X				X				
Subungual Hematoma									
Discuss role of radiographic evaluation with evaluation of an acute hematoma of the nail bed.	X					X			
Articulate the procedure of how to drain this type of a hematoma.		X					X		
Hand/Wrist Osteoarthritis									
Summarize clinical and radiological findings associated with osteoarthric and rheumatologic disorders, including Bouchards, Heberden, Virchow nodes.	X					X			
List contributing factors to development of arthricit changes.	X					X			
Identify the most commonly involved joints.	X					X			
Discuss available surgical indications and options.	X							X	
Fractures of the hand and wrist									
Discuss typical fractures of the wrist/hand and any associated cliassifications.	X								X
Interpret radiographic findings asscociate with common fractures of the wrist and hand.	X						X		
Describe the appropriate radiologic views to evaluate for this injury and discuss the role of x-rays in diagnosing scaphoid fracture.	X					X			
Explain the anatomy of the scaphoid and its blood supply and how location of fracture could affect healing and management decisions.	X					X			
Discuss the importance in evaluating for angulation for a metacarpal fracture.	X						X		
Distinguish when to use a short arm cast versus a long arm cas.	X							X	
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Carpal Tunnel Injection.		X					X		
Guyon Canal Injection.		X							X
De Quervain's Tenosynovitis Injection.		X					X		
Carpometacarpal Joint Injection.		X					X		
Trigger Finger Injections.		X					X		
Trigger Finger Release.		X							X
Ganglion Cyst Aspiration.		X				X			
Hydrodisection.		X							X

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Botulimum toxin injection.		X					X		
DRUJ injection.		X							X
THORACIC SPINE/ CHEST REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate. Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X		X					
b. Demonstrate familiarity with radiographs of the thoracic spine.	X	X			X				
c. Demonstrate familiarity with advanced imaging of the thoracic spine including CT, MRI, PET and bone scan.	X	X				X			
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and stretching and strengthening exercises for patients who sustain a thoracic spine injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			
Thoracic Degenerative Disc Disease, including HNP									
Explain why HNPs occur less frequently in the thoracic spine than in the lumbar or cervical spine.	X				X				
Thoracic Vertebral Compression Fracture									
Articulate a biomechanical theory of spinal support as well as a categorization system of spinal fractures.	X					X			
Describe the risks and benefits of conservative management vs. interventional treatment.	X					X			
Kyphosis									
Define kyphosis.	X				X				
List the specific diagnostic criteria of Scheuermann's Disease.	X					X			
Thoracic Zygapophyseal Arthropathy									
Report the typical pain patterns for these joints and the evidence for their role as pain generators.	X					X			
Costal Disorders									
Rib fractures									
Review the differential presentation of rib stress fractures vs. acute fracture, and complete vs. incomplete injuries.	X						X		
Describe the mechanism of injury and presentation for Flail Chest.	X						X		
State the treatment and prognosis for return to activity.	X							X	
Costovertebral and costotransverse disorders	X					X			
Describe costochondritis, costochondral sprain and separation.									

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Sternal Disorders									
Sternoclavicular sprains, subluxations, and dislocations									
Compare the differences between first vs second degree sprains and Type I, II, and III subluxations/ dislocations, as well as the relative dangers of whether the latter is anterior vs posterior.	X							X	
Sternal Fractures									
Soft Tissue Disorders - Pectoral Strains and Tears									
Describe a typical mechanism of injury, the different anatomical sites of injury.	X					X			
Discuss the role of conservative vs surgical treatment.	X						X		
Illustrate a presentation that would be more likely to be associated with performance-enhancing drugs.	X							X	
Disorders of the Vasculature and Vital Organs Thoracic Outlet Syndrome (TOS).									
Describe the unique diagnostic studies utilized to distinguish between neurogenic vs vascular thoracic outlet.	X					X			
Explain the various mechanisms of injury in supraclavicular, subclavicular, costoclavicular, and infraclavicular region.	X							X	
Identify the various presentations for each type of TOS, namely neural, arterial, and venous compression symptoms, and understand that compression can be postural/functional.	X					X			
Aortic Aneurysm	X					X			
Splenic Rupture	X					X			
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Thoracic Zygapophyseal (Facet) Joint Injections.		X						X	
Thoracic Epidural Injections.		X						X	
Thoracic Region Trigger Point and other Intramuscular Injections.		X				X			
Intercostal nerve block.		X							X
Kyphoplasty and vertebroplasty.		X							X

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
LUMBAR SPINE REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X		X					
b. Demonstrate familiarity with radiographs of the lumbar spine.	X	X			X				
c. Demonstrate familiarity with advanced imaging of the lumbar spine including CT, MRI, PET and bone scan.	X	X				X			
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and stretching and strengthening exercises for patients who sustain a lumbar spine injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			
Spondylolysis									
Identify the different types, the reliability of different imaging modalities in making this diagnosis, and management options.	X					X			
Spondylolesthesis									
Describe the different clinical causes, grading of this condition, the natural history, and management options.	X					X			
Spondylosis									
Review the normal anatomy and physiology of the spine and the degenerative cascade (dysfunction, instability and stabilization).	X				X				
Spinal Stenosis									
Compare central vs neuroforaminal spinal stenosis, including clinical presentation and indications for surgical management.	X					X			
Annular Tear									
Explain the anatomy of the annulus, including fiber alignment, blood supply, and innervation.	X					X			
Herniated Nucleus Pulposis (HNP)									
Identify clinical presentation of lumbar disc herniation with nerve root compression.	X			X					
Localize nerve root with associated lumbar disc herniation.		X			X				
Recognize the rationale and limitations of each imaging modality.	X					X			
Describe the prevalence of asymptomatic HNP in the general population as a function of age.	X				X				

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Lumbosacral Radiculitis/ Radiculopathy									
Discuss the neuroanatomy of the lumbar spine, spinal nerve roots, and lumbosacral plexus.	X				X				
Describe the typical presentation based on root level involvement.	X					X			
Outline the expected electrodiagnostic findings of a lumbar radiculopathy at 1 week, 3-4 weeks, 5-6 weeks, and greater than 6 months.	X					X			
Mechanical Causes of Lumbar Pain									
Discuss anatomy and presentation of mechanical low back pain and importance of "core strength" and lower extremity flexibility.	X					X			
Explain how errors in training, technique, and improper equipment can predispose to injury.	X					X			
Medical Causes of Lumbar pain									
Recognize and describe medical illness that can cause lumbar pain including rheumatologic renal, pancreatic, hepatic, vascular, pulmonary, hematologic including splenic, malignant and non-malignant etiologies, and infectious causes including disciitis, osteomyelitis, STDs, tuberculosis, etc.	X						X		
Pediatric/Youth Injuries									
Report the typical injuries associated with the skeletally immature, including spondylolysis, scoliosis, congenital anomalies not previously documented, tumors of childhood, JRA.	X						X		
Lumbar Vertebral Fracture									
Articulate a biomechanical theory of spinal support as well as a categorization system of spinal fractures.	X					X			
Compare and contrast the risks and benefits of conservative management vs interventional treatment.	X					X			
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Lumbar Zygapophyseal (facet) Joint Injection.		X					X		
Lumbar Medial Branch Block and Radiofrequency Ablation.		X						X	
Lumbar Epidural Injections, including Transforaminal, Interlaminar, and caudal approaches.		X						X	
Lumbar Region Trigger Point and other Intramuscular Injections.		X				X			
Sacroiliac joint injection.		X				X			
Lumbar Discography.		X							X
Lumbar sympathetic block.		X							X
Kyphoplasty and vertebroplasty.		X							X

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
PELVIS/ HIP REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X		X					
b. Demonstrate familiarity with radiographs of the pelvis/hip.	X	X			X				
c. Demonstrate familiarity with advanced imaging of the pelvis/hip including CT, MRI, PET and bone scan.	X	X				X			
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and stretching and strengthening exercises for patients who sustain a pelivs/hip injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			
Femoroacetabular Impingement									
Name the two types of FAI (CAM, Pincer) and explain how these deformities lead to abnormal contact between the femur and the acetabulum.	X					X			
Recall that the distribution of pain can be groin, lateral hip ("C sign") and/or in the posterior pelvis.	X					X			
Discuss the association of FAI with labral pathology. Describe the role of the diagnostic hip injection.	X					X			
Hip Labral Tear									
Recognize the prevalence of asymptomatic labral tears.	X					X			
Explain the relationship between labral tears and the development of early osteoarthritis.	X					X			
Discuss appropriate imaging modalities for labral tears (MRA vs 3T MRI vs US).	X					X			
Osteoarthritis									
Discuss the risk factors for hip osteoarthritis.	X					X			
Describe the role of aerobic exercises and strength training in management of hip osteoarthritis.	X	X				X			
Avascular Necrosis									
Discuss risk factors and role of imaging in diagnosis.	X					X			
Slipped Capital Femoral Epiphysis (SCFE) and Perthes Disease (see Pediatrics)									
Extra-Articular Hip Disorders:									
Femoral Neck Stress Fracture									
Discuss the risk factors for femoral neck stress fractures.	X					X			
Compare the two types: compression-side vs tension-side and the implications for management.	X						X		

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CONTENT DOMAIN: REGIONS				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Greater Trochanteric Pain Syndrome (GTPS)									
Outline the diagnostic criteria for GTPS.	X					X			
Explain the importance of ruling out referred pain from the lumbar spine and the hip joint in patients with this presentation.	X					X			
Discuss the role of hip abductor weakness in GTPS.	X					X			
Snapping Hip									
Describe the structures involved in the three types of snapping hip: external, internal and intra-articular.	X						X		
Piriformis Syndrome									
Review the pathophysiology of piriformis syndrome.	X					X			
Differentiate between piriformis syndrome vs L5-S1 radiculopathy.	X					X			
Pelvic Disorders:									
Hip Pointer									
Identify the muscles that insert onto the iliac crest.	X					X			
Describe physical examination or radiographic findings to help rule out an avulsion.	X					X			
Athletic Pubalgia									
Describe the primary sites of pathology.	X						X		
Discuss the proposed mechanism of injury.	X						X		
Osteitis Pubis									
Review the proposed underlying mechanism and radiographic finding associated with osteitis pubis.	X						X		
Adductor Strain									
Outline the grading scale for muscle strains.	X			X					
Describe the most common mechanism of injury.	X					X			
Stress Fractures									
List the risk factors associated with pubic ramus and sacral stress fractures.	X					X			
Explain the utility of xray vs MRI vs bone scan to diagnose pelvic stress fractures.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Sacroiliac Joint Dysfunction/Pain									
List the risk factors for SIJ pain.	X					X			
Explain the utility of combining 4-5 physical exam provocative maneuvers to diagnose SIJ pain.	X					X			
Pelvic Floor Dysfunction/Pain									
Define the muscles that comprise the pelvic floor.	X			X					
Characterize the manifestations of pelvic floor dysfunction in athletes, including stress urinary incontinence and pain.	X						X		
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Intra-articular Hip Injection.	X	X				X			
Sacroiliac Joint injection.	X	X				X			
Greater Trochanteric Bursa Injection.	X	X				X			
Iliopsoas Bursa Injection.	X	X				X			
Pubic Symphysis Injection.	X	X				X			
KNEE REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X		X					
b. Demonstrate familiarity with radiographs of the knee.	X	X			X				
c. Demonstrate familiarity with advanced imaging of the knee including CT, MRI, PET and bone scan.	X	X				X			
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and stretching and strengthening exercises for patients who sustain a knee injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			
Patellofemoral pain syndrome (PFPS)									
Identify the underlying factors contributing to patellar tracking/maltracking.	X					X			
Iliotibial Band Syndrome (ITBS)									
Describe some of the muscular imbalances and dysfunctions that may contribute to this syndrome.	X					X			
Review the anatomy of the IT band.	X			X					

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Plica Syndrome/Medial Plica Syndrome									
List the features that help distinguish medial plica syndrome from PFPS or injuries to the medial meniscus.	X	X					X		
Patellar tendinopathy and patellar tendon rupture									
Explain the role of ultrasound in aiding in diagnosis of patellar tendinopathy.	X					X			
Quadriceps tendinopathy and quadriceps tendon rupture	X					X			
Patellar subluxation/dislocation									
State the common factors underlying PFPS and patellar dislocation.	X					X			
Outline some of the pathoanatomic variants that may contribute to recurrent episodes and failure of even surgical management if not adequately addressed.	X						X		
Pre-patellar/Infra-patellar/supra-patellar bursitis									
Review the typical causes of each type of bursitis.	X					X			
Pes anserine bursitis/tendinitis									
Describe the location and anatomic structures comprising the pes anserinus.	X			X					
Baker's cyst/ popliteal cyst									
Explain the association between popliteal cysts and intra-articular pathologies such as OA.	X					X			
Identify the typical location and anatomy of a Baker's cyst, including the surrounding musculature.	X					X			
Osteoarthritis (OA)									
Explain why weight-bearing films are preferred to nonweight bearing X-Rays when evaluating Knee OA. Define what a merchant view is, and why it is obtained.	X					X			
Discuss the role of visco-supplementation in the conservative management of knee osteoarthritis.	X					X			
Meniscus Tears									
Differentiate the typical features of traumatic vs degenerative meniscus tears.	X					X			
Give examples of at least two provocative physical exam maneuvers for testing of meniscal injury.	X					X			
Describe the "double PCL" sign.	X						X		
Explain why bucket handle tears require surgical referral and with what urgency.	X						X		
Explain what areas of the meniscus receive greater vascularity and its application to the management of meniscal injuries.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Medial and Lateral Collateral Ligament Tears	X					X			
Anterior Cruciate Ligament Tear									
Recognize the role of biomechanical prevention programs in preventing ACL injuries.	X						X		
Posterior Cruciate Ligament Tear									
Discuss the role of non-operative management for PCL tears.	X						X		
Posterolateral corner injury									
Recall the relevant anatomy of the PLC. Identify the three most important static stabilizers of the posterolateral knee, and what movements they restrict.	X						X		
Identify the two other important ligamentous structures commonly injured along with the PLC.	X						X		
Tibial plateau fracture									
Discuss the associated neurovascular risks associated with medial tibial plateau fractures.	X						X		
Osteochondritis dessicans									
State the most common location for an OCD lesion in the knee.	X						X		
Sinding-Larsen-Johansson Disease and Osgood-Schlatter's Disease									
Describe the typical patient population in which these conditions appear.	X					X			
Fractures									
Describe the common fractures about the knee.	X							X	
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Intra-articular knee joint injection.	X					X			
Knee joint effusion aspiration.	X					X			
Pre-patellar bursa aspiration and injection.	X					X			
Baker's cyst aspiration.	X					X			
Patellar reduction.	X	X					X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
ANKLE/ FOOT REGION									
For each condition describe typical clinical presentation, diagnostic criteria, and non-surgical and surgical management, including rehabilitation prescription, as appropriate. Additional objectives are below.									
a. H&P. Perform an appropriate H&P.	X	X		X					
b. Demonstrate familiarity with radiographs of the ankle/ foot.	X	X			X				
c. Demonstrate familiarity with advanced imaging of the ankle/ foot including CT, MRI, PET and bone scan.	X	X				X			
d. Describe an appropriate rehabilitation program including postural reeducation, functional restoration, and stretching and strengthening exercises for patients who sustain an ankle/ foot injury.	X					X			
e. Discuss appropriate DME for each specific condition diagnosis.	X					X			
Ankle									
Lateral ankle sprain									
Identify the lateral ankle stabilizing ligaments and classification of injury.	X					X			
Discuss potential associated conditions such as anterior process calcaneus fracture, peroneal tendinopathy, sinus tarsi syndrome, intraarticular pathology.	X						X		
High ankle sprain. syndesmotic injury									
Discuss mechanism of injury.	X					X			
Describe radiographic findings in unstable sprain.	X	X					X		
Peroneal tendinopathy									
Characterize anatomy and function of peroneus longus, brevis, superficial peroneal retinaculum.	X					X			
Describe exam maneuver for snapping peroneal.		X					X		
Sinus tarsi syndrome									
Report anatomic confines of sinus tarsi.	X						X		
Anterior ankle impingement									
Compare bony versus soft tissue impingement and risk factors.	X						X		
Posterior tibial tendinopathy									
Discuss the classification of posterior tibial dysfunction and acquired flat foot deformity.	X					X			
Review orthotic / bracing options.	X	X					X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Achilles tendinopathy/ retrocalcaneal bursitis									
Differentiate anatomy and pathophysiology of Achilles peritenonitis, midsubstance tendinosis, insertional tendinopathy and retrocalcaneal bursitis/subcutaneous bursitis.	X						X		
Posterior ankle impingement / os trigonum syndrome/ flexor hallucis longus tendinopathy	X						X		
Talar osteochondral injury	X						X		
Tarsal tunnel syndrome									
Describe anatomy of the tarsal tunnel.	X					X			
Describe the innervation to the foot and ankle region, including the Saphenous nerve, Superficial and Deep peroneal nerves, Sural nerve, Medial and Lateral Plantar nerves.	X					X			
Foot									
Hindfoot									
Discuss the Windlass mechanism, the basic biomechanics of gait, and the purpose of an orthotic device for the foot.	X					X			
Plantar fasciopathy.	X					X			
Calcaneal stress fracture.	X						X		
Talocalcaneal coalition.	X						X		
Midfoot									
Navicular stress fracture / os navicularis	X						X		
Lisfranc injury	X						X		
Outline anatomy of ligament complex. Describe mechanism of injury and identify most frequently misdiagnosed injury of foot.	X					X			
Determine appropriate radiographic workup and evaluate stability of injury.	X					X			
Determine appropriate triage to orthopaedics.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Forefoot									
Metatarsal injury. For the 5th metatarsal fracture, describe 3 zones of injury, an Avulsion fracture, a Jones fracture, and a Dancer's fracture, including classification of injury and triage to orthopaedic surgery.	X						X		
Morton's neuroma.	X					X			
Frieberg's Infraction.	X						X		
Turf toe / 1st MTP plantar plate sprain. Describe anatomy of region.	X						X		
Hallux rigidus.	X						X		
Crystall-induced arthropathy.	X					X			
Gout / Pseudogout.	X						X		
Sesamoid injury. Discuss sesamoiditis, sesamoid stress injury, and bipartite sesamoid.	X								
Interventions. Describe the approach, imaging modality for needle guidance (as appropriate), indications, and precautions. Recognize appropriate use of available injectables, including risks/benefits profile.									
Fracture Management of the foot									
Describe the fundamentals of acute splinting and casting.	X			X					
Perform acute splinting and casting.	X	X					X		
Explain appropriate criteria for triage to orthopedic service.	X					X			
Common ultrasound-guided Injections									
Tibiotalar.	X	X					X		
Subtalar.	X	X					X		
Peroneal Tendon Sheath.	X	X					X		
Sinus Tarsi.	X	X					X		
Achilles Peritenon / Brisement procedure.	X	X					X		
Retrocalcaneal Bursa.	X	X					X		
Plantar fascia.	X	X					X		
Flexor Hallucis Longus Tendon Sheath.	X	X					X		
Os Trigonus / Posteror Ankle Impingement.	X	X					X		
Tarsometatarsal Joint.	X	X					X		
1st MTP Joint.	X	X					X		
Morton's Neuroma.	X	X					X		
Compartment Pressure Testing of lower limb		X						X	

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CONTENT DOMAIN: EXAMS				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
CERVICAL EXAM: DESCRIBE AND DEMONSTRATE THE CORRESPONDING EXAMS:									
Inspection/Palpation, including landmark anatomy	x	x		x					
ROM, including neck and shoulder	x	x			x				
Gait	x	x				x			
Myotomal/Dermatomal Testing	x	x		x					
Deep tendon reflexes, including Hoffman's, babinski, clonus	x	x		x					
Spurling maneuver, cervical facet, brief shoulder exam	x	x			x				
Assess cervical and rib segmental motion	x	x							x
Neural Tension Test	x	x						x	
SHOULDER CONDITIONS: DESCRIBE AND DEMONSTRATE THE CORRESPONDING EXAMS:									
Inspection/Palpation, including landmark anatomy, should symmetry, atrophy	x	x		x					
ROM active/passive	x	x			x				
Brief Cervical Spine Exam	x	x			x				
Scapular Motion	x	x				x			
Myotomal/Dermatomal Testing	x	x		x					
Deep tendon reflexes	x	x		x					
Hawkins/neers, speeds, yergason	x	x			x				
Jobes (empty can), cofield, sulcos, o'brien, load and shift test, liftoff,	x	x				x			
Apprehension, relocation test	x	x					x		
Evaluation for GIRD	x	x						x	
Resistive maneuvers for scapular instability	x	x						x	
Evaluation for TOS	x	x				x			
Assess thoracic rib segmental motion	x	x							x
Kinetic chain evaluation	x	x							x
ELBOW CONDITIONS: DESCRIBE AND DEMONSTRATE THE CORRESPONDING EXAMS:									
Inspection/Palpation, including landmark anatomy	X	X			X				
ROM, including shoulder and wrist	X	X			X				
Myotomal/Dermatomal Testing	X	X		X					
Deep tendon reflexes, including Hoffman's	X	X		X					
Tinels, cozen, varus/valgus, maudsley	X	X				X			
Assess radial head motion, joint play	X	X						X	
Neural Tension Test	X	X						X	
Inspection with carrying angles	X	X			X				

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Neurovascular assessment	X	X				X			
Kinetic chain evaluation	X	X							X
WRIST AND HAND CONDITIONS: DESCRIBE AND DEMONSTRATE THE CORRESPONDING EXAM TO EACH OF THE COMPONENTS:									
Inspection/Palpation, including landmark anatomy, atrophy	X	X				X			
ROM, including elbow	X	X				X			
Myotomal/Dermatomal Testing	X	X		X					
Deep tendon reflexes, including Hoffman's	X	X		X					
Tinels, cozen, phalens, carpal compression test	X	X			X				
Snuff box assessment, watsons	X	X				X			
Neurovascular assessment	X	X				X			
Kinetic chain evaluation	X	X							X
Key-grip, ok sign, finkelstein's, carpal instability, DRUJ instability, TFCC tenderness, 2-point discrimination	X	X				X			
Evaluation for digital injuries	X	X					X		
UCL Stress Test of thumb	X	X					X		
Evaluate for TOS, including roos, adsons	X	X				X			
THORACIC SPINE/ CHEST MUSCULOSKELETAL CONDITIONS: DESCRIBE AND DEMONSTRATE THE CORRESPONDING EXAM TO EACH OF THE COMPONENTS:									
Inspection/Palpation, including landmark anatomy and focal rib tenderness	X	X		X					
ROM, including neck and shoulder	X	X			X				
Gait	X	X				X			
Myotomal/Dermatomal Testing	X	X		X					
Deep tendon reflexes, including Hoffman's, babinski, clonus	X	X		X					
Spurling maneuver, brief shoulder exam/detailed scapular exam	X	X			X				
Assess thoracic and rib segmental motion	X	X							X
Assess core strength and stability	X	X						X	
Adam's Test	X	X				X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
LUMBAR SPINE CONDITIONS: DESCRIBE AND DEMONSTRATE THE CORRESPONDING EXAM TO EACH OF THE COMPONENTS:									
Inspection/Palpation, including landmark anatomy	X	X		X					
ROM, including hip	X	X			X				
Gait/stance	X	X				X			
Myotomal/Dermatomal Testing	X	X		X					
Deep tendon reflexes, including babinski, clonus	X	X		X					
SLR/Slump test, L'hermitte, lumbarfacet, brief hip exam, SI Joint testing, hoovers test	X	X			X				
Assess lumbar/sacral pelvis and hip segmental motion	X	X							X
Neural Tension Test	X	X						X	
Assess Leg Length	X	X		X					
Assess core stability and strength	X	X						X	
Kinetic chain evaluation	X	X							X
Schobers Test	X	X					X		
Adam's Test	X	X				X			
PELVIS/ HIP MUSCULOSKELETAL CONDITIONS: LEARN AND DEMONSTRATE THE CORRESPONDING EXAM TO EACH OF THE COMPONENTS:									
Inspection/Palpation, including landmark anatomy	X	X		X					
ROM, including lumbar spine and knee	X	X			X				
Gait/stance	X	X				X			
Myotomal/Dermatomal Testing	X	X		X					
Deep tendon reflexes, including babinski, clonus	X	X		X					
SLR/Slump test, L'hermitte, ober test, FABER Test, FADIR Test, log roll, SI Joint testing, hoovers test	X	X				X			
Stinchfield, hip scour, Drehman, resist adduction	X	X						X	
Assess pelvic floor	X	X							X
Assess lumbar/sacral pelvis and hip segmental motion	X	X							X
Assess pelvic and sacral dysfunction	X	X							X
Neural Tension Test	X	X						X	
Assess Leg Length	X	X		X					
Assess core stability and strength	X	X						X	
Kinetic chain evaluation	X	X							X
Thomas test	X	X			X				

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
KNEE CONDITIONS: LEARN AND DEMONSTRATE THE CORRESPONDING EXAM TO EACH OF THE COMPONENTS:									
Inspection/Palpation, including landmark anatomy (genu varus/valgus)	X	X		X					
ROM, including hip and ankle	X	X		X					
Myotomal/Dermatomal Testing	X	X		X					
Deep tendon reflexes	X	X		X					
Varus/valgus, mcmurray, thessaly, anter/posterial drawer, Sag sign, OBER	X	X			X				
Posterolateral corner testing, pivot shift testing	X	X							X
Lachman, dial test, Evaluation of patellar instability/tracking, patellar ballottement	X	X				X			
Kinetic chain evaluation	X	X							X
Fibular head, Extensor mechanism testing	X	X				X			
ANKLE/ FOOT CONDITIONS: DESCRIBE AND DEMONSTRATE THE CORRESPONDING EXAM TO EACH OF THE COMPONENTS:									
Inspection/Palpation, including landmark anatomy	X	X			X				
ROM with knee flexed and extended	X	X			X				
Myotomal/Dermatomal Testing	X	X		X					
Deep tendon reflexes, including clonus, babinski	X	X		X					
Tinels, varus/valgus	X	X				X			
Anterior/posterior/infer drawer	X	X						X	
Neural Tension Test, Thompson test, homan sign	X	X						X	
Syndesmosis (kleiger) testing	X	X			X				
Neurovascular assessment	X	X				X			
Kinetic chain evaluation	X	X							X
Mid and forefoot testing, fibular assessment, talocrural motion testing	X	X						X	
Gait, vibratory, proprioception	X	X				X			
Foot and arch evaluation, weight bearing and non-weight bearing, too many toes sign, metatarsal squeeze testing, digital axial load testing	X	X				X			
Dynamic evaluation of posterior tibialis	X	X					X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
GENERAL									
Fibromyalgia									
Review the ACR criteria.	X			X					
Describe typical clinical presentation.	X			X					
Describe/initiate treament/first line management.	X	X		X					
Coordinate care within the interdisciplinary teams.	X	X		X					
Advanced pharma management of FM.	X								X
Ankylosing Spondylitis									
Review the ACR criteria.	X			X					
Describe typical clinical presentation including conducting physical examination.	X			X					
Interpret basic radiographic and laboratory results.	X	X		X					
Interpret advanced imaging (MRI, CT, Bone Scan, more than radiographs).								X	
Describe/initiate treament/first line management.	X	X		X					
Coordinate care within the interdisciplinary teams.	X	X		X					
CRPS									
Review the Budapest criteria.	X			X					
Describe typical clinical presentation including conducting physical examination and typical radiographic findings.	X				X				
Interpret advanced imaging (MRI, CT, Bone Scan, more than radiographs).	X	X						X	
Describe/initiate treament/first line management including indication for sympathetic blocks.	X	X				X			
Perform interventional procedures including sympathetic block and botox.		X							X
Coordinate care within the interdisciplinary teams.	X	X				X			
Gout & Pseudogout									
Describe typical clinical presentation including conducting physical examination.	X				X				
Interpret laboratory and radiologic findings, including fluid analysis.	X	X						X	
Describe/initiate treament/first line management, including coordination with primary physician/rhuma.	X	X				X			
Perform interventional procedures, including large joint aspirations/injections.		X				X			
Perform interventional procedures, including small/med joint or image guided aspirations/injections.		X						X	

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				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Osteoarthritis									
Describe typical clinical presentation including conducting physical examination.	X				X				
Interpret laboratory and radiologic findings, including fluid analysis.	X	X						X	
Describe/initiate treament/first line management.	X	X				X			
Perform interventional procedures, including large joint aspirations/injections.		X				X			
Perform interventional procedures, including small/med joint or image guided aspirations/injections.		X						X	
Recognize surgical indication.	X					X			
Treat post surgical recovery and complications, including persistent pain and neuropathay and post arthroplasty pain syndroms.	X	X							X
Rheumatoid Arthritis									
Review the ACR criteria.	X			X					
Describe typical clinical presentation including conducting physical examination.	X			X					
Interpret basic radiographic and laboratory results.	X	X		X					
Interpret advanced imaging (MRI, CT, Bone Scan, more than radiographs).								X	
Coordinate care within the interdisciplinary teams.	X	X		X					
Describe/initiate treament/first line management, including coordination with primary physician/rhuma.	X	X				X			
Perform interventional procedures, including large joint aspirations/injections.		X				X			
Perform interventional procedures, including small/med joint or image guided aspirations/injections.		X						X	
Psoariatic Arthritis									
Review the ACR criteria.	X			X					
Describe typical clinical presentation including conducting physical examination.	X			X					
Interpret basic radiographic and laboratory results.	X	X		X					
Interpret advanced imaging (MRI, CT, Bone Scan, more than radiographs).								X	
Coordination of care within the interdisciplinary teams.	X	X		X					
Describe/initiate treament/first line management, including coordination with primary physician/rhuma.	X	X				X			
Perform interventional procedures, including large joint aspirations/injections.		X				X			
Perform interventional procedures, including small/med joint or image guided aspirations/injections.		X						X	
Acute Compartment Syndrome									
Explain risk factors and expected H&P.	X				X				
Coordinate the emergent referal.	X					X			
Recognize and describe imaging and interventional diagniostics and treatment.	X					X			
Perform and interpet compartment pressure testing.		X							X

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CONTENT DOMAIN: GENERAL				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Exertional Compartment Syndrome									
List risk factors and expected H&P, including post exertional evaluation.	X				X				
Coordinate the surgical referal.	X					X			
Describe/initiate treament/first line management.	X	X				X			
Recognize and describe imaging and interventional diagniostics and treatment.	X					X			
Perform and interpret compartment pressure testing.		X							X
Describe the role of EDM.	X						X		
Vascular Entrapment Syndroms	X								
Recognize exertional Vascular Entrapment Syndrome.	X				X				
Recognize of Acute Vascular compromise.	X			X					
Discuss risk factors and expected H&P, including post exertional evaluation.	X						X		
Coordinate the surgical referal.	X				X				
Describe/initiate treament/first line management.	X	X					X		
Recognize and describe diagniostics and treatment.	X							X	
Explain the role of EDM.	X						X		
DVT									
Identify risk factors and clinical presentation/H&P.	X			X					
Outline diagnostic work-up.	X			X					
Coordinate with specialty referal.	X			X					
Describe/initiate treament/first line management.	X	X		X					
Summarize DVT prevention.	X			X					
Counsel patient regarding activity modifications.									
Leg Length Difference									
Demonstrate how to clinically measure leg length.	X	X		X					
Conduct radiographic assessment.	X				X				
Determine treatment plan.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Osteoporosis									
Review Pathophysiology.	X			X					
Examine and manage fragility fractures.	X								X
Identify risk factors.	X			X					
Ultilize and interpret diagnositic imaging.	X	X			X				
Interpret FRAX.	X	X						X	
Screening for secondary causes of osteoprosis.	X							X	
Initiate medical treatment.	X							X	
Initiate activity modifications, exercise perscription.	X				X				
Coordinate care with specialists.	X	X			X				
Osteonecrosis/AVN									
Review Pathophysiology.	X					X			
Evaluate and manage initial presentation.	X					X			
Identify risk factors.	X			X					
Ultilize and interpret diagnositic imaging.	X	X				X			
Initiate medical treatment.	X						X		
Initiate activity modifications.	X						X		
Coordinate referals to specialists.	X	X				X			
Hypermobility									
Define hypermobilty.	X				X				
Perform screening with beighton criteria.	X	X						X	
Describe unique treatment considerations.	X						X		
Compare and contrast the differences between physologic and pathologic biomechanics.	X						X		
Recognize and describe treatment modalities, including theraputic ultrasound, shockwave, TENS, phonophoresis, inonphoresis, cold/heat, laser therapy, e-stim.	X			X					
Write diagonosis-specific prescriptions for PT and OT.	X	X				X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
RHEUMATIC DISEASES									
Recognize the following conditions and refer as approperiate:									
Sjogrens.	X					X			
Psoriatic Arthritides.	X					X			
Buerger's Disease.	X					X			
JRA.	X			X					
Raynaud's.	X					X			
Scleroderma.	X					X			
Psoriasis.	X			X					
PMR.	X			X					
METABOLIC DISORDERS									
Understand the following co-morbilities and the effect on MSK care:									
Diabetes.	X				X				
Renal Disease.	X				X				
Pulomonary.	X				X				
Cardiovascular.	X				X				
HERDITARY/CONGENITAL									
Understand the following co-morbilities and the effect on MSK care and exercise:									
Osteogenesis Imperfecta.	X				X				
Sickle Cell.	X				X				
Beta Thalassemia.	X				X				
Understand the following co-morbilities, associated cardiovasular risks, and the effect on MSK care:									
Marfans Syndrome.	X					X			
Ehlers-Danlos.	X					X			

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CONTENT DOMAIN: MSK ULTRASOUND				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
MUSCULOSKELETAL ULTRASOUND									
Be familiar with the American Institute of Ultrasound Medicine (AIUM) guidelines for musculoskeletal ultrasound found at: http://www.aium.org/resources/guidelines/musculoskeletal.pdf	X					X			
Basic Principles									
Compare the relative strengths and weaknesses of musculoskeletal (MSK) ultrasound in comparison to other imaging modalities. Be able to discern appropriate circumstances for use of MSK ultrasound.	X					X			
Outline the basic principles of impedance, reflection, refraction, and absorption as it relates to musculoskeletal ultrasound.	X					X			
Define echogenicity, and understand the descriptive terms anoechoic, hypoechoic, and hyperechoic.	X				X				
Describe anisotropy/the anisotropic effect, and how to account for it when using MSK ultrasound.	X	X				X			
List other common ultrasound artifacts such as reverberation, acoustic shadowing, and through transmission.	X					X			
Explain how frequency, resolution, and attenuation affect ultrasound imaging.	X					X			
Discuss the role of adjusting depth, gain, focal zones, and time gain compensation (TGC) on images obtained.	X	X				X			
Discuss the role of Doppler imaging in MSK ultrasound including their role in assessing neovascularization.	X	X				X			
Basic Technique									
Articulate how to make appropriate transducer selection.	X				X				
State the role of ultrasound gel.	X				X				
Recognize the importance of anchoring the hand during scanning.	X	X			X				
Discuss conventions of transducer positioning (i.e., left and right on screen in relation to transducer orientation and anatomic positions such as proximal, distal, medial and lateral).	X	X				X			
Imaging									
Describe the normal ultrasonographic appearance of typical structures encountered in MSK ultrasound (e.g., muscle, tendon, ligament, nerve, vessels, and bone).	X	X				X			
Scan and obtain images for the 6 major regions of the body as recommended by the AIUM Practice Guidelines for MSK US (shoulder, elbow, wrist/hand, hip, knee, foot/ankle).	X	X					X		
Intervention									
Discuss the principles and techniques of injection and other interventions commonly performed in a Sports Medicine office.	X	X					X		
State the different techniques involved in needle guidance in-plane vs out of plane relative to the transducer.	X					X			
Perform basic interventional injections to areas that require ultrasound guidance for correct placement (i.e., hip joint, knee, glenohumeral joint).		X				X			
Perform interventional procedure for tendon and nerve pathology.		X					X		
Describe indications, precautions, and post-procedure management.	X						X		

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				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
IMAGING									
Approach. Describe a general approach to imaging, ie., how the choice of imaging is generally influenced by the history and physical exam, and how the results will be integrated into an assessment and plan.	X	X				X			
For each of the below diagnostic imaging modalities, describe how it works, general category of use, advantages and disadvantages, and contraindications. Additional learning objectives are below:									
Plain radiographs									
Describe the characteristics of a fracture on x-ray.	X					X			
Explain how many radiograph views are required for fracture identification and why.	X					X			
Recognize the appearance of a degenerative joint.	X					X			
Discuss the appearance (or lack) of the major visible structures on radiographs, including, but not limited to air, fluid, bone, cartilage, muscle, calcific deposits, and the major visible organs.	X					X			
Utilize appropriate fluoroscopy views and understand radiation safety in spinal interventions.	X	X						X	
Computed Tomography									
Express the role of CT in evaluation of injuries – which are likely to benefit from the use of CT as opposed to MRI.	X					X			
Illustrate when contrast should be used in conjunction with CT imaging. Identify circumstances when 3D reconstruction would be most helpful.	X						X		
Describe the indications for CT angiography in sports medicine.	X						X		
Delineate the findings of acute intracranial hemorrhage.	X			X					
Delineate the findings of bone healing.	X						X		
Delineate the findings of intra-abdominal visceral injury.	X							X	
Identify when to refer to CT for needle guidance.	X					X			
Magnetic Resonance Imaging									
Explain the difference between the different sequences, including T1-weighted, T2-weigted, proton density, and STIR – specifically state how cortical bone, medullary bone, cartilage, tendon, muscle and fluid should appear.	X					X			
Recognize the appearance of tendinopathy, fracture, cartilage injury and fluid collections.	X	X				X			
Identify the circumstances where MRI provides unique and clinically critical information.	X					X			
Describe when contrast should be used intra-articularly and intra-vascularly.	X					X			
Describe MR neurography.	X							X	

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Musculoskeletal Ultrasound									
Identify the characteristic appearance of different tissue types in this modality.	X	X				X			
Compare and contrast the advantages and disadvantages of this modality, including resolution, portability, cost, and accessibility.	X					X			
Describe sonopalpation.	X				X				
See separate Musculoskeletal Ultrasound section for more details									
Bone scintigraphy									
Outline the 3 phases of the test.	X					X			
Justify the use of detecting stress injuries.	X					X			
Distinguish when SPECT is advantageous in conjunction with this imaging modality.	X					X			
Cardiovascular / vascular imaging									
Determine echocardiogram indications in athlete.	X						X		
Explain cardiac testing options for post-COVID patients.	X						X		
Doppler ultrasonography.	X						X		
Contrast angiography, venography, arteriography (positional).	X						X		
Discuss vascular workup for exertional limb pain.	X						X		
LABORATORY STUDIES IN SPORTS MEDICINE									
Demonstrate an understanding of the correlation and pertinence of routine and specialized laboratory tests with regard to various injuries and sport specific illnesses that a team physician may need to order or encounter under the following circumstances:									
Pre-participation, including routine blood work, genetic testing, anemia-related tests.	X						X		
Endurance Events, including electrolyte panel, sweat and urine tests, and blood tests for rhabdomyolysis.	X						X		
Cardiovascular Assessment, including genetic markers of cardiac disease.	X						X		
Pulmonary, including pulmonary function tests, and metacholine challenge test.	X						X		
Hematologic Disorders, including sickle cell trait/ disease, Clotting Factor Deficiencies, G6-PD Hereditary Spherocytosis, March hemoglobinuria.	X						X		
Infection, including Hepatitis, Bacterial, HIV, HSV, Bite wounds, STDs, Heterophile antibody (monospot)/throat culture, EBV specific antibody; HIV testing, including legal requirements.	X						X		
Diabetes, including Hgb A1C, Glycosylated Hgb, Glucose tolerance test, Casual plasma glucose vs fasting, and routine labs.	X						X		
Other Endocrine Considerations, including pregnancy test, testosterone levels, gnrh, FSH,LH (karyotypes) Prolactin, TSH,Free Thyroxine, Calcium Progestinwithdrawal.	X						X		
Rheumatologic, including ANA, CRP, and ESR.	X					X			
Neuromuscular Disorders including CK, indication for muscle biopsy.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Describe tests for blood doping/ banned substances/ ergogenic aides, including Hematocrit levels, EPO, electrolytes, liver function tests, lipid profile, HGH, U/A, Urine screens, Uric acid, Testosterone/ Epitestosterone ratio, Gas Chromatography/ Radioimmunoassay/ Mass Spectrometry.	X							X	
ELECTRODIAGNOSIS IN SPORTS									
Nerve Injury Fundamentals									
Memorize the classification scheme for type and severity of nerve injuries (neuropraxia, axonotomesis, and neurotmesis).	X				X				
Match the type of injury with the potential for recovery and prognosis and the expected electrodiagnostic findings (immediately post injury, 4-6 weeks post injury, months post injury, and years post injury).	X				X				
Describe indications and rationale for neurosurgical referral for a nerve injury as well as surgical treatment options.	X					X			
Explain the appropriate time course for the performance of the nerve conduction studies and needle EMG exam for a suspect nerve injury.	X				X				
Specific Nerve Injuries. For each of the following nerve injuries, describe the typical clinical presentation, the affected nerve and specific location(s) of injury, the most common cause(s), and the electrodiagnostic findings specific to each injury:									
Cervical Spine: cervical radiculopathy, thoracic outlet syndrome, long thoracic neuropathy.	X					X			
Cervical Spine: stinger and transient quadreparesis.	X						X		
Shoulder: axillary neuropathy, suprascapular neuropathy, brachial plexopathy including Parsonage-Turner Syndrome.	X					X			
Elbow/ Arm: cubital tunnel syndrome, posterior interosseous nerve (PIN) syndrome, and radial tunnel syndrome (RTS), anterior interosseous nerve (AIN) syndrome, and pronator syndrome.	X					X			
Hand/Wrist: carpal tunnel syndrome, Guyon's Canal ulnar nerve entrapment (aka cyclist's palsy). Contrast electrodiagnostic findings in an ulnar neuropathy at the wrist with an entrapment at the elbow. Explain the anatomic causation between wheelchair sports and carpal tunnel syndrome (CTS) and ulnar neuropathy at the wrist.	X					X			
Lumbosacral Spine: lumbar radiculopathy, sciatic neuropathy, lumbosacral plexopathy.	X					X			
Hip/Pelvis: Pudendal nerve entrapment, with BSN, femoral neuropathy, obturator neuropathy.	X							X	
Knee: Peroneal neuropathy. Explain the importance of EMG evaluation the head of the biceps femoris.	X					X			
Foot/Ankle: Tarsal Tunnel Syndrome (TTS). List the 5 categories of TTS and describe the sensory and motor deficits in TTS. Name 3 neurological syndromes that may produce foot drop.	X						X		

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				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Describe evaluation and management of the following injuries:									
Upper Extremity Compartment Syndrome (UECS)									
Review the typical history, physical examination findings, and initial treatment of UECS.	X						X		
Describe the pathophysiology and management of the of Volkmann's Ischemic contractures.	X						X		
Lower Extremity Compartment Syndrome									
Acute Compartment Syndrome. Review the typical history, physical examination findings, and initial treatment of acute compartment syndrome.	X					X			
Chronic Exertional Compartment Syndrome. Describe the natural history and treatment of Chronic Exertional Compartment Syndrome (CECS).	X					X			
Contrast history, physical, and diagnosis studies for CECS and exertional vascaular claudication.	X						X		
Describe the compartments of the lower leg, including the blood supply, muscles and innervation within each compartment.	X					X			
Explain which athletes aremost commonly affected by CECS.	X						X		
Bicycle Seat Neuropathy (BSN)									
Explain the natural history of bicycle seat neuropathy (BSN) in cyclists and how a bicycle seat can be altered to improve symptoms.	X						X		

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				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
COMMUNICATION & TEAMWORK IN SPORTS MEDICINE									
General Communication									
Describe common pitfalls associated with improper and adverse forms of communication.	X	X				X			
Explain the importance of setting "on-call" expectations with your ATC and setting consistent times for training room sessions.	X	X	X					X	
Recognize that it is the responsibility of the team physician to blend into the Training Room Environment.	X	X	X				X		
Availability									
Discuss the importance of physician availability.	X		X			X			
Identify the sports with highest risks of injury.	X						X		
Prepare to triage communication in an effective, accurate, and efficient manner within a sports medicine environment.	X	X					X		
Teamwork									
Explain the importance of developing relationships with the team's ATCs, Head Coaches, and any other medical personnel that may assist in treating your athletes.	X		X				X		
Emergencies									
State the important elements of an Emergency Action Plan (EAP), including how they might be different for different venues. Please see Sideline Coverage and Sports Medicine Emergencies section.	X							X	
Chain of Command									
Describe the importance of having a predetermined chain of command, including a single person who will be the voice of the medical staff.	X						X		
Recognize that the Head Certified Athletic Trainer is the liaison between the head coach and the Physician.	X	X	X				X		
Explain why communication from the Head Team Physician to the Director of Athletics (at the Collegiate Level) can be considered reasonable if an emergency situation occurs.	X	X	X					X	
Recognize that emotions are heightened during games and protocols are established during pre-season planning to avoid miscommunication.	X					X			
Media									
Explain the role of the team physician regarding relations with the media and the mechanism for communicating information.	X						X		
Recognize the importance of speaking with "one voice" as medical providers.	X	X	X				X		
Explain the nuances of social media and its affect on providing medicine care.	X	X	X		X				
Review benefit and potential liabilities of social media in sports medicine.	X	X	X				X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
PREVENTION & SCREENING, INCLUDING PPE									
Describe the contents of the standard Pre-participation Exam (PPE) form found on the American Medical Society for Sports Medicine (AMSSM) site at http://www.amssm.org/Publications.html, especially the historical questions related to cardiovascular risk. Additional objectives are below.	X						X		
Identify the goals of the PPE, including forming a therapeutic alliance with the athlete, and the different types of prevention.	X						X		
Identify the major cardiovascular, pulmonary, medical, neurological and musculoskeletal injuries that can predispose to loss of life, limb, other morbidity, or diminished sports function should be sought first. Describe the diagnoses that disqualify an athlete from safe participation in contact sport.	X							X	
Describe the cost and benefits of the different types of cardiac screening modalities.	X							X	
Summarize what referral resources a PPE team should have access to.	X						X		
Compare and contrast the pros and cons of a station-based PPE.	X						X		
Discuss how underlying injuries/conditions may affect performance in different sports.	X						X		
Identify resources for determining age-appropriate expectations for vital signs and functioning.	X							X	
Identify resources to direct athletes for performance improvement in deficient areas.	X						X		
Be familiar with timing of need for repeating physical exams.	X						X		
Describe basic principles of return to play for previously injured athletes.	X					X			
Direct appropriate sports return based upon prior injuries/ surgeries.	X						X		
Determine the best practice for concussion baseline testing at the high school and collegiate levels.	X						X		
Determine the best practice for concussion baseline testing at professional levels.	X							X	
SIDELINE COVERAGE & SPORTS MEDICINE EMERGENCIES									
Staff and responsibilities									
Discuss the importance of the team physician knowing the affiliated staff (coach, athletic director/ event director athletic trainers, EMT, event security, other physicians) and their roles, as well as having a clearly recognized chain of command on and off the field.	X	X	X				X		
Location and Supplies									
Articulate the importance of knowing the venue address, nearest hospital, floor plan/field layout, location of AED, spine board, ambulance, etc.	X	X					X		
Identify appropriate equipment kit.	X	X					X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Communication & Protocolization.									
Describe the role of established protocols for evaluation, treatment, and disposition of injuries, including an Emergency Action Plan.	X						X		
Discuss appropriate technology for communication among staff.	X							X	
Explain the importance of protocols for clearing injury area to protect the injured and treating staff, especially during races.	X							X	
Discuss the importance of protocol review and practice in event preparation.	X							X	
Emergencies.									
Know what the specific needs are among staff regarding BLS, ACLS, and ATLS certification.	X							X	
Describe the prioritization protocol in injuries referenced by the ABCDEF acronym (Airway, Breathing, Circulation, Disability, Exosure, Final Disposition), and for each of the below types of injuries, discuss how to apply the ABCDEFs.									
Head and neck injuries: mild TBI, spinal cord injuries.	X						X		
ENT injuries.	X						X		
Cardiac events – sudden cardiac arrest.	X					X			
Thorax – pneumothorax, exercise-induced bronchospasm.	X						X		
Abdominal, Pelvic, and Genitourinary Injuries.	X						X		
MSK and extremity injuries.	X						X		
Environmental and miscellaneous emergencies, including heat and cold exposure and anaphylaxis.	X					X			
Describe the on-field examination and management of suspected cervical spine injuries, including:									
Describe the physical examination of an athlete with a suspected cervical spine injury and list signs and symptoms concerning for a spinal cord injury that necessitate immobilization.	X	X				X			
List the sideline equipment and processes for management of an athlete with a suspected spinal cord injury.	X	X					X		
List the step-by-step procedure for spine boarding an athlete on the field. Contrast how this procedure differs for athletes wearing full football pads and helmet versus an athlete wearing football helmet without pads, versus an athlete who is not wearing equipment. Review the procedure for removing facemasks.	X						X		
Explain how to evaluate an ambulatory athlete on the sideline for a suspected cervical spine injury. In an athlete with transient neurologic symptoms, what criteria should be met before considering return to play.	X						X		
ETHICAL & MEDICO-LEGAL ASPECTS AND PROFESSIONALISM IN SPORTS MEDICINE									
Advocacy									
Explain the role of the team physician, specifically identifying for whom she is an advocate.	X	X	X				X		

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CONTENT DOMAIN: SPORTS				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Autonomy									
Describe the role of the team physician in providing informed consent to the athlete and the importance in making decisions in the context of the player's personal goals and preferences.	X	X	X				X		
Liability									
Recognize the importance of limiting unnecessary liability for the team physician or the institution.	X						X		
Disclose why a physician may or may not be covered to take care of her student-athletes when they are out of state, and identify resources to check individual state rules.	X						X		
Identify what rules govern the liability of physicians caring for other teams' players, spectators, or other staff members.	X							X	
Confidentiality									
Define HIPPAA and FERPA.	X			X					
Explain how the physician's relationship with the school or professional club inhibits the normal strict rules governing doctor-patient confidentiality.	X						X		
Describe how the physician's responsibility regarding giving players advance notice of any potential sharing of medical information.	X	X						X	
Minors									
Describe when and how parents should be involved in their child's training and care and when parental permission needs to be obtained.	X					X			
Professionalism and Ethics									
Identify the important qualities of a team physician, including altruism, honesty, compassion, integrity, and respect.	X						X		
Recall the physician's responsibility to self, patient, institution, and medical profession.	X						X		
Prevention									
Discuss the role of the PPE (see Screening & Prevention section above).	X					X			
Infectious Disease									
Describe the role of the physician in limiting the spread of infectious diseases (see Primary Care Sports Medicine section above).	X						X		

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CONTENT DOMAIN: MULTIDISCIPLINARY AREAS				CORE			SPECIALIZED		
				1	2	3	4	5	6
	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
CARDIOPULMONARY SPORTS MEDICINE, INCLUDING EXERCISE PHYSIOLOGY									
Be comfortable performing a basic cardiopulmonary H&P, including an auscultatory cardiac exam.		X		X					
Be familiar with the fundamentals of reading an EKG, and identify electrophysiologic changes of the athletic heart.	X	X					X		
Familiarize yourself with the standard Pre-participation Exam (PPE). See separate PPE section of these guidelines.	X						X		
Know the physiologic effects of exercise on the cardiopulmonary system.									
Explain the relationship between cardiac output, heart rate, and stroke volume.	X			X					
Define the Fick Equation.	X					X			
Compare and contrast the differences in the acute cardiovascular and pulmonary effects of and cardiovascular adaption to static vs dynamic exercise.	X						X		
Define VO2max and explain how it changes with training.	X						X		
Discuss what adaptation is primarily responsible for increased cardiac output as a result of training.	X						X		
Recall what pulmonary adaptations occur in trained individuals, including changes in respiratory rate at rest vs submaximal and maximal exercise, tidal volume, minute ventilation, and respiratory muscle strength.	X						X		
Outline morphologic changes in the heart associated with static and dynamic exercise. Review the law of Laplace.	X						X		
Describe Athletic Heart Syndrome. Know the typical normal value range for left ventricular cavity size and septal thickness.	X						X		
Describe changes in the cardiovascular system that occur following periods of deconditioning.	X					X			
Relate approximate metabolic equivalents of task (MET) of common activities, and be aware of appropriate MET recommendations when prescribing exercise to individuals of varying fitness levels.	X					X			
Characterize the role of perceived exertion/ the Borg Rating of Perceived Exertion (RPE) Scale in exercise prescription.	X					X			
Congenital Heart Disease and Exercise									
Recognize the importance of obtaining a value for pulmonary artery pressure in directing exercise prescriptions in individuals with congenital heart disease (CHD).	X						X		
Recall basic CHD terminology (e.g., cyanotic vs. acyanotic, shunt, tetrology of Fallot, transposition, etc.).	X			X					
Explain the concept of static vs dynamic exercise, and that different CHD conditions may permit high amounts of one vs the other.	X					X			
Explain how certain types of CHD can be at increased risk for cardiac events in collision sports (e.g., Marfan's Syndrome).	X					X			
Discuss the history and physical exam findings typically present in shunt lesions (e.g., ventricular septal defects, atrial septal defects, and patent ductus arteriosus).	X							X	
Identify the history and physical exam findings characteristic of hypertrophic cardiomyopathy (HCM).	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Sudden Cardiac Death									
State what sports and age ranges have the highest incidences of sudden cardiac death (SCD), and what etiologies of SCD are more common at what age ranges.	X						X		
Explain how non-obstructive HCM presents and how exercise can worsen the symptoms of HCM.	X						X		
Establish which coronary anomalies associated with sudden death, including the most common anomaly.	X						X		
Report the most frequently identifiable pathogen associated with myocarditis.	X						X		
Explain the significance of arrhythmogenic right ventricular dysplasia.	X						X		
Describe Long QT syndrome.	X			X					
Describe commotio cordis.	X						X		
Discuss the appropriate management by a Sports Medicine Physician of commonly detected arrhythmias and syncope.	X						X		
Pulmonary disorders and exercise									
Outline exercise induced asthma (EIA), its presentation, common triggers (including association with temperatures and humidity), and treatment.	X					X			
Explain the role of chronic asthma treatment in managing EIA.	X							X	
Deduce the likelihood of exercises with high minute ventilation vs those with low minute ventilation to exacerbate EIA.	X							X	
Recognize the presentation and treatment of vocal cord dysfunction (VCD).	X							X	
Describe the physiologic responses to exercise that occur in individuals with COPD.	X					X			
PRIMARY CARE SPORTS ISSUES									
For the below body systems, be familiar with the common conditions listed below, including presentation, inital treatments/indications for referrals, effect on athletic participation, and return to play policy.									
Cardiac									
Myocarditis, hypertension, hypertrophic cardiac myopathy, long q-t syndrome, cardiac arrhythmias, cardiac murmurs, marfan's syndrome.	X						X		
Respiratory									
Dyspnea, asthma, exercise induced bronchospasm, vocal cord dysfunction, exercise induced anaphylaxis.	X						X		
Gastrointestinal									
Acute gastroenteritis, peptic ulcer disease, delayed gastric emptying, runners diarrhea, lower gi bleeding, acute hepatitis, hepatosplenomegaly.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Endocrine									
Diabetes, including Type I and II; hypothyroidism, hyperthyroidism.	X						X		
Renal and Genitourinary									
Hematuria, proteinuria, acute renal failure, nephrolithiasis, stress incontinence, genital injuries, urinary tract infections, direct injuries – testicular trauma, penile trauma, vulva trauma.	X						X		
Hematology/ Immunology									
Sickle cell trait, venous thromboembolism, anemia: sports dilution, iron-deficiency.	X						X		
Infectious Disease									
URI's, infectious mononucleosis (note especially return to play guidelines), influenza, herpes simplex, STD's (chlamydia, gonorrhea), blood born pathogens (HIV, hepatitis B, hepatitis C).	X						X		
COVID/Pandemic									
Recall screening and vaccination protocols.	X						X		
State most recent return to play guidelines for recreational athletes and appropriate workup and return to play.	X					X			
State most recent return to play guidelines for competitive athletes and appropriate workup and return to play.	X						X		
SPORTS DERMATOLOGY									
For each skin lesion, be able to accurately describe and identify:									
Environmental Injuries									
Describe appearance, treatment, and prevention of environmental injuries including, sunburn, frostnip/ frostbite, and chilblains (perino).	X						X		
Urticaria									
Discuss the treatment of the various types of urticaria, including acquired cold urticarial, solar urticaria, aquagenic urticaria, and exercise-induced urticaria.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Skin infections. Describe the typical symptoms, examination findings, testing, pathogen, treatments, and restrictions from competition/practice (if any) for the following:									
Impetigo, Folliculits.	X						X		
MRSA, Abscess, Furnunculosis . Describe the specific procedure for performing an I&D for treatment of an abscess.	X						X		
Cellulitis.	X						X		
Scabies.	X						X		
Molluscum Contagiousum.	X						X		
Herpes gladitorum.	X						X		
Tinea Corporis/Pedis.	X						X		
Warts.	X						X		
Swimmers' ear.	X						X		
Swimmer's itch.	X						X		
Sea-bather's eruption.	X						X		
Skin Lacerations									
Describe the initial wound management and evaluation of skin laceration.	X						X		
Characterize the specific procedure for suturing a laceration to the face/scalp and trunk.	X	X						X	
Discuss what suture material is recommended for trunk, extremity/scalp, and facial lacerations.	X							X	
Outline common suturing techniques and the indications for each.	X	X						X	
Explain the specific procedure for applying tissue adhesives (Dermabond) to a laceration and any contraindications to this.	X	X					X		
Auricular Hematoma (Cauliflower ear).									
Describe the typical appearance, cause, and treatment.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
CONCUSSION/ BRAIN INJURY IN SPORTS									
Define Concussion	X				X				
Describe the mechanism of injury and pathophysiology of mild traumatic brain injury (primary and secondary injury).	X				X				
Recall the signs and symptoms.	X				X				
Identify risk factors for injury and their role for a protracted course, including age; gender; sport; and history.	X					X			
Identify risk factors for injury and their role for a protracted course, including genetics, position; medical and psychiatric history.	X							X	
Identify risk factors for injury and their role for a protracted course, including nature of the injury (number of injuries, severity, and duration of symptoms).	X						X		
Describe an appropriate evaluation of a concussion, including:									
Pre-injury testing: baseline testing / pre-participation exam	X						X		
Sideline Evaluation and Management									
Rule out of catastrophic head / neck injury.		X			X				
Role of sideline assessment tools.		X	X				X		
Description and application of rules regarding prohibition of same day return to play if concussion is suspected.	X	X					X		
Comprehensive Clinic Evaluation including:									
Symptom inventory: Physical, Cognitive, Sleep, Emotional.	X	X				X			
Neurological examination.	X	X			X				
Balance assessment.	X	X			X				
Mental status evaluation.	X	X			X				
Role of Neuropsychological Testing	X				X				
Know the fundamentals of clinical management of a concussion including:									
Relative physical and cognitive rest.	X					X			
Role of first line medication management.	X	X			X				
Role of medication management for refractory cases.	X	X						X	
Indentify need for vestibular therapy referal.	X	X				X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Return to academics.		X				X			
Return to athletics through a graded exertional program.	X	X					X		
Role of sub-symptom threshold exercise in Concussion.	X	X					X		
Management of Sleep and Emotional wellbeing in concussion care.	X	X					X		
Describe Post-concussion Syndrome, including the role of a multi-disciplinary approach, medications.	X				X				
Discuss a post-concussion syndrome exercise prescription		X					X		
Be familiar with these fundamental concepts:									
Second impact syndrome.	X					X			
Disqualification from sport.	X	X					X		
Chronic traumatic encephalopathy.	X						X		
Describe current local and national efforts for prevention, education, and legislation regarding concussion in sports.	X							X	
Explain and apply local legislation on return to play following concussion.	X	X					X		
Discuss and apply various prevention strategies for concussion in sports, such as rule changes, tackling technique, and equipment modification.	X	X						X	
PEDIATRIC SPORTS MEDICINE									
Fractures									
Define **diaphysis, metaphysis, epiphyseal plate, and epiphysis.**	X					X			
Review the SalterHarris (SH) Classification and explain which type of SH fractures require surgical fixation.	X							X	
Explain the differences between buckle/ torus, greenstick, and plastic deformation fractures.	X						X		
Define **avulsion injury**									
Review the most common type of apophyseal injuries in the shoulder, elbow, pelvis, knee, and foot.	X					X			
Explain why avulsion fractures are more common in the skeletally immature versus the skeletally mature.	X					X			
Review the common avulsion injuries at the anterior superior iliac spine, anterior inferior iliac spine, ischial tuberosity, and lesser trochanter.	X					X			
Describe the natural history of Slipped Capital Femoral Epiphysis (SCFE) and Perthes Disease, include clinical and radiographic findings as well as demographics.	X					X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Epiphysitis/Overuse									
Define Little League shoulder and elbow.	X						X		
Explain the association between fatigue, pain, and throwing.		X					X		
Review the pitching cycle and when injuries occur in each phase of the cycle.	X	X					X		
Recognize the most common traction injuries to the pelvis, knee, ankle, and foot.	X						X		
Describe the natural history and contributing factors to these overuse injuries.	X						X		
Compare and contrast the differences between spondylolisthesis and spondylolysis.	X				X				
Review the imaging studies used to diagnose pars interarticularis fractures.	X	X				X			
Describe indication and contraindication of lumbosacral brace in treatment of pars fracture.	X	X					X		
Osteo -chondrosis and -necrosis									
Define Osteochondritis dessicans (OCD).	X					X			
Outline what makes a bony fragment stable versus unstable.	X	X					X		
State when to refer an OCD to a surgeon versus when to manage an OCD non-surgically.	X	X					X		
Explain the difference between OCD and Juvenile OCD (JOCD).	X						X		
Review the most common locations for an OCD lesion in the knee and the ankle.	X						X		
Define Osteonecrosis.	X				X				
Identify and name the osteonecrosis lesions of the elbow, wrist, spine, hip, knee, ankle, and foot in the skeletally immature.	X						X		
For each lesion, describe the natural history, common demographic association, imaging modality, and treatment of choice.	X	X						X	
Prevention & Development									
Explain the importance of not specializing in one sport at an early age.	X	X	X			X			
Describe why appropriate attire, footwear, and appropriate fitting protective equipment are important to prevent injuries.	X						X		
Discuss "Love of Sport" and why coaches and parents must not cause undue pressure to have children perform while injured.	X	X	X				X		
Review the theories behind ACL injury in adolescents and the preponderance of female ACL injuries.	X						X		
Analyze preventative strategies including prehabilitation programs designed to correct biomechanical risk factors and neuromuscular controls.	X	X					X		
Describe why physiological differences between younger and older adolescent athletes can predispose these individuals to different injuries.	X						X		
Emphasize the importance of staying active and healthy and its effect on socialization, physical development, and maturation of our younger athletes.	X	X				X			

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Thermoregulation									
Explain why greater surface area to body mass ration in children predisposes them to heat intolerance, including a slower acclimation rate.	X						X		
Review fluid replacement guidelines before, during, and after exercise/competition for children and adolescents.	X						X		
Summarize the latest research on the importance of water, electrolyte-sports drinks, and chocolate milk as recovery drinks after competition in this age group.	X							X	
WOMEN'S HEALTH, INCLUDING FEMALE ATHLETE TRIAD									
Differences between male and female athletes									
Describe the major differences in skeletal growth and development, physiology and body composition, and neuromuscular movement patterns in male and female athletes. Explain which differences remain despite correction for size.	X						X		
Describe how these differences may affect training and performance.	X	X					X		
Compare the prevalence and mechanisms of injury in female vs male athletes, including knee injuries (ACL injuries, patellofemoral pain syndrome), hip injuries (labral tears), joint hypermobility and osteoarthritis.	X	X					X		
The Female Athlete Triad									
Explain the definition of the Female Athlete Triad and Relative energy deficiency in sport (RED-S) and how it has evolved over the past 20 years.	X	X					X		
Discuss the interrelationship between nutritional status, reproductive function and bone metabolism.	X	X					X		
List risk factors for the triad, including important historical questions to ask female athletes.	X	X					X		
Nutrition									
Recognize at-risk athletes and identify when to referred to nutritionist.	X					X			
Define energy availability and demonstrate how to calculate this for female athletes.	X							X	
Describe the nutritional spectrum from adequate energy availability to eating disorder.	X						X		
Menstruation									
Review the improtance of menstrual dysfunction in the setting of relative energy deficiency in sport (RED-S).	X					X			
Discuss the importance of interdisciplinary management in the relative energy deficiency in sport (RED-S). Explain the limitations of oral contraceptives in management of the relative energy deficiency in sport (RED-S).	X	X					X		
Define primary and secondary amenorrhea, oligomenorrhea, luteal phase dysfunction and polycystic ovarian disease.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Bone metabolism									
Discuss the effect of different types of sports participation on bone accretion in the female athlete (with and without appropriate nutritional intake).	X							X	
Compare and contrast the differences between bone density and bone microarchitecture.	X						X		
Discuss the utility of Dual-energy X-ray absorptiometry (DXA) and the difference between T and Z scores.	X					X			
Explain the pathophysiology of stress fractures in the setting of the relative energy deficiency in sport (RED-S).	X					X			
Describe the appropriate clinical work-up for the female athlete who is suspected of having the relative energy deficiency in sport (RED-S).	X	X					X		
Exercise/Activity in the Peripartum Female									
Compare the maternal benefits and risks of exercise during pregnancy.	X					X			
Describe the relative and absolute contraindications for exercise during pregnancy.	X					X			
Express the musculoskeletal changes that occur during pregnancy and postpartum phases.	X					X			
Assess the limitations in imaging and medication management in pregnant and nursing females.	X				X				
Pelvic Floor Dysfunction in the Female Athlete									
Describe the origin, insertion and function of the muscles that comprise the pelvic floor.	X					X			
Review the types of pelvic floor dysfunction that occur in athletes.	X							X	
Define stress urinary incontinence and associated risk factors.	X					X			
Describe the clinical assessment and specialized management of pelvic floor dysfunction in the female athlete.	X	X						X	
THE DISABLED ATHLETE									
Perform H&P and demonstrate familiarity with pathophysiology for patients with spinal cord injuries (SCI), amputations, and developmental disorders.	X	X				X			
Explain and identify equipment needs for athletes with SCI/neuromuscular disease/CNS disorder.	X					X			
Explain and identify equipment needs for athletes with an amputation.	X					X			
For each area below, be familiar with the general topic. Additional specific objectives are below.									
Pre-participation Physical Examination (PPE)									
Describe the recommended setting for performing a PPE for disabled athletes.	X						X		
List PPE considerations specific for disabled athletes.	X						X		
Demonstrate familiarity with screening tests and specific restrictions for athletes with Downs Syndrome.	X						X		

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Paralympics									
Demonstrate familiarity with the various sports comprising the Paralympics, the athlete disabilities allowed to participate, and the equipment used in each of these sports.	X	X						X	
Special Olympics									
Demonstrate familiarity with the various sports comprising the Special Olympics and the athlete disabilities allowed to participate in them.	X	X						X	
Autonomic Dysreflexia (AD)									
Describe the pathophysiology, symptoms treatment, and prevention of AD.	X	X		X					
Define "boosting" and explain how it is used by SCI athletes in competitive sports and how this is monitored/ detected during competition.	X	X				X			
Orthostatic Hypotension									
Describe the pathophysiology, symptoms, treatment, and prevention of orthostatic hypotension in SCI patients.	X	X			X				
Thermoregulation									
Discuss the pathophysiology, symptoms, treatment, and prevention of heat illness and hypothermia in SCI patients.	X	X			X				
Acute and Chronic Injuries									
Describe traumatic and over-use injuries that are common among disabled athletes, including prevention and treatment.	X						X		
Shoulder: Explain the rationale for higher injury rates in SCI athletes and the specific conditions that are most typical.	X					X			
Elbow: Explain the rationale for higher injury rates in SCI athletes and the specific conditions that are most typical.	X						X		
Hand/ Wrist/ Digits: Discuss the rationale for higher injury rates in SCI athletes and the specific conditions that are most typical.	X							X	
Fractures: Discuss the rationale for higher injury rates in SCI athletes and the specific areas that are the most *affected*.	X						X		
Skin breakdown. List risk factors in SCI athletes for skin breakdown and prevention strategies. Be familiar with staging and treatment of skin ulcers.	X				X				
Peripheral Nerve entrapments									
Identify common sites for compressive mononeuropathies in wheelchair athletes.	X					X			
Review treatment and prevention for peripheral nerve injuries.	X					X			

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Osteoporosis									
Describe what populations of disabled athletes are susceptible to osteoporosis and the related pathophysiology.	X					X			
Outline diagnostic workup, including laboratory testing and imaging, and treatment of osteoporosis in this population.	X	X				X			
Explain role of imaging to evaluate for fracture in the osteoporotic patient.	X				X				
Visually impaired athlete									
Enumerate the sports where visually impaired athletes can compete and the equipment required for competition.	X	X					X		
Discuss the interaction required with non-visually impaired athletes working with the visually impaired.	X							X	
PROSTHETICS & ORTHOTICS									
Perform an H&P and demonstrate familiarity with upper and lower extremity amputations.	X					X			
Prescribe common orthoses and prostheses, including proper technique for donning and doffing, cost, indications, and its effect on function.	X	X				X			
Be familiar with each general topic below. Additional specific objectives are also listed.									
Amputee Prosthesis									
Describe the K levels and prosthetic goals for patients at each K level.	X				X				
Describe the components of upper extremity and lower extremity prostheses.	X				X				
Write an appropriate prescription for prosthetic.	X	X				X			
Outline special prosthetic considerations for LE amputees who are active in swimming, fishing, golf, running, and/or skiing.	X	X						X	
Outline special considerations that need to be addressed during pre-participation physicals for athletes with an amputation.	X	X						X	
Skin Breakdown in Amputees									
Identify the most common sites of skin breakdown among amputees.	X					X			
Describe the pathophysiology of choke syndrome (verrucous hyperplasia) and how to manage/treat it.	X					X			
Analyze the stages of skin breakdown.	X	X		X					
Propose prevention strategies and treatment for amputees with skin breakdown, including diet recommendations and activity modification/sports participation.	X								X

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	Knowledge	Skill	Attitude	Basic	Intermediate	Advanced	Basic	Intermediate	Advanced
Musculoskeletal Injuries in Amputees									
Identify the sites(s) of peripheral nerve entrapment most common among lower extremity amputees.	X					X			
Describe the pathophysiology, diagnosis, and treatment of neuromas.	X					X			
Diagnostic evaluation and interventional treatment of neuromas.	X	X						X	
Contrast the common overuse injuries among active/ athletic upper extremity amputees compared to active/ athletic lower extremity amputees.	X	X						X	
Describe strategies for injury prevention, including training considerations, diet, and equipment/prosthetic fitting.	X	X						X	
COMMON GAIT DEVIATIONS FOR LOWER LIMB AMPUTEES									
Describe and recognize gait deviations.	X	X				X			
Prescribe prosthetic modification.	X	X				X			