

A **Competency-Based Guide** to Curriculum Development

# Core Curriculum Outline

for Rheumatology Fellowship Programs

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AMERICAN COLLEGE  
of RHEUMATOLOGY  
*Empowering Rheumatology Professionals*

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## INTRODUCTION

The subspecialty of rheumatology includes a wide array of autoimmune, inflammatory, and non-inflammatory conditions that affect the musculoskeletal and other organ systems. The purpose of rheumatology training programs is to 1) train fellows to be accomplished practitioners and consultants in the rheumatic diseases, and 2) encourage the professional and scholarly attitudes and approaches of a competent subspecialist that are needed to maintain an understanding of current concepts in rheumatology as advances occur.

This Core Curriculum Outline is a comprehensive update of the previous ACR Core Curriculum Outline for Program Directors (2006) and is designed to reflect the Next Accreditation System (NAS) and the importance of competency-based training and assessment in graduate medical education, as defined by the Accreditation Council for Graduate Medical Education (ACGME). Also included in this core curriculum outline are:

- Internal Medicine Subspecialty Reporting Milestones (Appendix A)
- Rheumatology Entrustable Professional Activities (EPAs) (Appendix B)
- Rheumatology Curricular Milestones (Appendix C)
- Rheumatology Toolbox: Activities and Assessments (Appendix D)

The updated curriculum outline continues to be organized by the six ACGME core competencies. These are:

- Medical Knowledge
- Patient Care
- Practice-based Learning and Improvement
- Systems-based Practice
- Interpersonal and Communications Skills
- Professionalism

The two major sections of Basic Science and Clinical Science are incorporated into the Medical Knowledge section. The clinical aspects of these areas reside in the Patient Care section. Those aspects of the Core Curriculum that pertain to practice-based learning and improvement, systems-based practice, interpersonal and communication skills and professionalism are expanded into their own individual major sections. The purpose of specifically highlighting the core competencies in the Core Curriculum Outline is to clarify their essential components. The description of how and where they are acquired in the course of fellowship training, the projected benchmarks or markers of performance expected of the trainee, and suggestions for tools that can be used to measure that performance are well-delineated within the Rheumatology Curricular Milestones (Appendix C) and Rheumatology Toolbox (Appendix D), the latter containing the educational activities and evaluation tools employed during fellowship training.

The updated Curriculum Outline continues to be significantly expanded in the area of pediatric rheumatology. The ACGME suggests that “programs with the qualified faculty and facilities provide training in pediatric rheumatic disease.” The ACR recognizes that, because of the worldwide shortage of pediatric rheumatologists, many internist rheumatologists in clinical practice will be called upon to evaluate and treat children. The Core Curriculum reflects the ACR goal that every rheumatology fellow should have familiarity with pediatric rheumatic diseases, whether or not he/she has the opportunity to rotate through a pediatric rheumatology clinic. Because reading is not a substitute for direct experience, training programs are encouraged to find opportunities for their fellows to see patients in a pediatric rheumatology clinic. However, because many will not have the opportunity to spend time in a pediatric rheumatology clinic, the curriculum emphasizes a minimum set of core knowledge in pediatric rheumatology for the adult trainee. To further this end, Appendix E provides more detailed pediatric rheumatology information.

This outline is consistent with the requirements of the ACGME Review Committee for training in rheumatology and serves as a guide for Training Program Directors and fellows in meeting these requirements.

The Core Curriculum Outline is also meant to provide a detailed guide for Program Directors to use in the development of their own fellowship training curriculum. This outline presents a comprehensive view of the components of a competency-based training program in rheumatology. However, individual training programs will adapt this outline for their own curriculum and may reflect their particular areas of expertise and resources. This document is meant to be a practical resource for Program Directors to provide detailed descriptions of general competencies in rheumatology and provide tools for performance markers and assessments in these areas (see Rheumatology Curricular Milestones and Rheumatology Toolbox, Appendix C and Appendix D, respectively).

## HOW TO USE THIS CURRICULUM OUTLINE

A competency-based curriculum is presented in this Curriculum Outline and can be incorporated by the Program Director into an individual curriculum. The Outline divides each competency into several sections. A Definition of the competency in the context of rheumatology training is provided. The Essential Components of each competency are then listed and described. These components can be used to provide the rationale for a given training activity. Documentation of a competency-based curriculum involves describing the specific educational activities through which the training program works to develop and assess the six ACGME core competencies in its trainees during the course of the fellowship training program. According to the ACGME Program Requirements for Graduate Medical Education in Rheumatology, while the description of each educational activity (e.g., rotation, conference, or research activity) should delineate its goals and objectives, fellow responsibilities by year of training, and level of fellow supervision, the structure and methods used to evaluate the development of competency and the means by which the Program Director documents the educational activity components of the curriculum are all at the discretion of the individual fellowship program and may vary widely from program to program. Several Appendices have been included to provide milestones and tools that can be used to develop and document a competency-based curriculum.

## I. MEDICAL KNOWLEDGE

The subspecialty of rheumatology includes a wide array of autoimmune, inflammatory, and non-inflammatory conditions that affect the musculoskeletal and other organ systems. A working knowledge of the basic and clinical sciences that relate to musculoskeletal and rheumatic disease is fundamental to the practice of rheumatology. Recognition of normal and pathogenic processes of the immune system form the basis of reliable diagnosis and the development and use of an increasingly sophisticated range of immunomodulatory treatments for the rheumatic diseases.

Similarly, knowledge of the basis for and use of laboratory tests of immune activity is a principal asset of the practicing rheumatologist. Rheumatology trainees must also have practical understanding of the approaches and modalities used by other specialists and health professionals (Nurses, Nurse Practitioners, Physician Assistants, etc.) for the treatment of rheumatic diseases in order to manage the care of their patients effectively. Training programs must teach and emphasize the cognitive skills that are necessary to apply this detailed knowledge to problem solving for diagnosis, treatment and research of the rheumatic diseases.

### **DEFINITION**

Medical knowledge refers to the assimilation of established and evolving biomedical, clinical, and cognate sciences, and to the application of this knowledge to patient care.

## ESSENTIAL COMPONENTS

### BASIC SCIENCES

- A. Anatomy and biology of musculoskeletal tissues: for each tissue, distinguish the embryology, development, biochemistry and metabolism, structure, function, and classification
  1. Connective tissue cells and components: fibroblasts, collagens, proteoglycans, elastin, matrix glycoproteins
  2. Joints and ligaments: diarthrodial joints, intervertebral discs, synovium, cartilage
  3. Bone: development, structure, turnover and remodeling (including the role of osteoclasts, osteoblasts, osteocytes, as well as hormonal and cytokine regulation)
  4. Muscle and tendons
  5. Vasculature and endothelium
  6. Skin
- B. Immunology
  1. Anatomy and cellular elements of the immune system
    - a. Lymphoid organs: gross and microscopic anatomy, structure and function
    - b. Organization of the immune system: innate and adaptive immune systems
    - c. Specific cells: for each cell type, the ontogeny, structure, phenotype, function, and major activation markers/receptors
      - i. Lymphocytes: T cells and B cells (naive, memory, activated, regulatory, innate lymphoid cells)
      - ii. Antigen presenting cells: dendritic cells, monocytes and macrophages
      - iii. Natural killer cells
      - iv. Neutrophils and eosinophils
      - v. Other cells: NKT cells, mast cells, endothelial cells, platelets, fibroblasts
  2. Immune and inflammatory mechanisms
    - a. Antibody structure and genetic basis of antibody diversity

- b. Receptor/ligand interactions: activating and inhibiting receptors, complement receptors, Fc receptors, adhesion molecules
    - c. Toll-like (TLR) and other pattern recognition receptors (PRR)
    - d. Molecular basis of T cell antigen recognition and activation
    - e. B cell receptors: structure, function, antigen binding, effector functions
    - f. Antigens: types, structure, processing, presentation, and elimination
    - g. Major histocompatibility complex: structure, function, nomenclature, and immunogenetics
    - h. Major immune cell signaling pathways
      - i. Complement/Kinin systems: structure, function, and regulation
      - j. Acute phase reactants and enzymatic defenses
    - k. Intracellular signal transduction
      - l. Inflammasome, neutrophil extracellular traps (NETosis)
  - 3. Cellular interactions and immunomodulation
    - a. Cellular activation and regulation: mechanisms of activation and suppression of function (e.g. T cell and B cell interactions via CD28:CD80/86)
    - b. Cytokines: origin, structure, effect, site of action, metabolism, regulation, and gene activation
    - c. Immune cell trafficking; adhesion molecules, chemokines
    - d. Inflammatory mediators: origin, structure, effect, site of action, metabolism, and regulation
  - 4. Immune responses
    - a. Antibody-mediated: opsonization, complement fixation, and antibody dependent cellular cytotoxicity
    - b. Cell-mediated: cells and effector mechanisms in cellular cytotoxicity, granuloma formation, and delayed type hypersensitivity
    - c. IgE-mediated: acute and late-phase reactions
    - d. Mucosal immunity and the microbiome
    - e. Innate immune responses: natural killer cells, pattern recognition, interaction with adaptive responses
    - f. Pathologic immune responses: immune complex-mediated (physicochemical properties and clearance of immune complexes), graft versus host response, abnormal apoptosis
  - 5. Immunoregulation
    - a. Tolerance: mechanisms of central and peripheral tolerance, including clonal selection, deletion, and anergy
    - b. Cell-cell interactions: help and suppression; collaboration among cells for control of the immune response
    - c. Autoimmunity: pathogenesis of systemic and organ specific autoimmunity
    - d. Idiotype networks: inhibition and stimulation
- C. Crystalline disease metabolism
- 1. Purine and uric acid metabolism
    - a. Purine: biochemistry, synthesis, and regulation
    - b. Uric acid: origin, elimination, and physicochemical properties
    - c. Purine pathway enzyme deficiencies and immunodeficiency: ADA, PNP
  - 2. Calcium-based crystal metabolism
    - a. Crystals: factors affecting formation, induction of inflammation
    - b. Genetic abnormalities contributing to crystal formation
- D. Genetics and epigenetics
- E. Biomechanics of bones, joints, and muscles: principles of kinesiology of peripheral/axial joints and gait and how alterations in biomechanics contribute to musculoskeletal disorders

## F. Neurobiology of Pain

1. Peripheral afferent nociceptive pathways
2. Central processing of nociceptive information
3. Biopsychosocial model of pain

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## CLINICAL SCIENCES

### A. Rheumatic Diseases

For each disease, acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, clinical expression (including clinical subtypes), pathology.

1. Rheumatoid Arthritis.
2. Seronegative spondyloarthritides: ankylosing spondylitis, reactive spondyloarthritis/arthritis, psoriatic arthritis, inflammatory bowel disease-associated arthritis, arthritis associated with acne and other skin diseases, synovitis, acne, pustulosis, hyperostosis, and osteitis (SAPHO) syndrome, and undifferentiated spondyloarthritis.
3. Lupus erythematosus: systemic, discoid, and drug-related; anti-phospholipid antibody syndrome
4. Primary anti-phospholipid syndrome
5. Scleroderma: diffuse and limited cutaneous systemic sclerosis, localized scleroderma, chemical/drug-related, other fibrosing skin disorders (eosinophilic fasciitis, eosinophilia-myalgia syndrome, nephrogenic systemic fibrosis, scleromyxedema, scleredema of Buschke)
6. Other systemic autoimmune diseases: Sjögren syndrome, mixed connective tissue disease, undifferentiated connective tissue disease, and overlap syndromes
7. Other inflammatory diseases: relapsing polychondritis, panniculitis (lobular or septal (erythema nodosum)), adult-onset Still's disease
8. Vasculitides: giant cell arteritis/polymyalgia rheumatica, Takayasu's arteritis, polyarteritis nodosa, ANCA-associated vasculitis such as granulomatosis with polyangiitis (GPA, formerly Wegener's granulomatosis), eosinophilic granulomatosis with polyangiitis (EGPA, formerly Churg-Strauss syndrome) and microscopic polyangiitis, anti-glomerular basement membrane disease, cryoglobulinemia, Immunoglobulin A vasculitis (formerly Henoch-Schönlein purpura), hypocomplementemic urticarial vasculitis, Behçet's disease, Cogan's syndrome, cutaneous leukocytoclastic angiitis, primary central nervous system vasculitis, isolated aortitis, vasculitis from systemic disorders, infections, drugs, malignancies, and overlap necrotizing vasculitis.
9. Infectious
  - a. Infectious arthritides: bacterial (non-gonococcal and gonococcal), mycobacterial, spirochetal (syphilis, Lyme), viral (HIV, hepatitis B, hepatitis C, parvovirus, chikungunya, dengue), fungal, parasitic
  - b. Whipple's disease
10. Reactive arthritides: acute rheumatic fever, arthritis associated with subacute bacterial endocarditis, intestinal bypass arthritis, post-dysenteric arthritides, post-immunization arthritis, other colitis-associated arthropathies,
11. Metabolic, endocrine, and hematologic disease associated rheumatic disorders
  - a. Crystal-associated diseases: monosodium urate monohydrate (gout), calcium pyrophosphate dihydrate deposition disease, basic calcium phosphate (hydroxyapatite), calcium oxalate
  - b. Endocrine-associated diseases: rheumatic syndromes associated with diabetes mellitus, acromegaly, parathyroid disease, thyroid disease, Cushing disease
  - c. Hematologic-associated diseases: rheumatic syndromes associated with hemophilia, hemoglobinopathies, angioimmunoblastic lymphadenopathy or lymphoma, multiple myeloma, hemophagocytic lymphohistiocytosis/macrophage activation syndrome

12. Bone and cartilage disorders
  - a. Osteoarthritis - primary and secondary osteoarthritis
  - b. Metabolic bone disease: low bone mass, osteoporosis, osteomalacia, bone disease related to renal disease
  - c. Paget's disease of bone
  - d. Avascular necrosis of bone: idiopathic, secondary causes, osteochondritis dissecans
  - e. Others: transient osteoporosis, hypertrophic osteoarthropathy, diffuse idiopathic skeletal hyperostosis
13. Hereditary, congenital, and inborn errors of metabolism associated with rheumatic syndromes
  - a. Disorders of connective tissue: Marfan syndrome, osteogenesis imperfecta, Ehlers-Danlos syndrome, pseudoxanthoma elasticum, hypermobility syndrome
  - b. Mucopolysaccharidoses
  - c. Osteochondrodysplasias: multiple epiphyseal dysplasia, spondyloepiphyseal dysplasia
  - d. Inborn errors of metabolism affecting connective tissue: homocystinuria, ochronosis
  - e. Storage disorders: Gaucher's disease, Fabry's disease,
  - f. Immunodeficiency: IgA deficiency, complement component deficiency, SCID and ADA deficiency, PNP deficiency, others
  - g. Autoinflammatory syndromes: familial Mediterranean fever, hyperimmunoglobulinemia D syndrome, tumor necrosis factor receptor-associated periodic syndromes (TRAPS), periodic fever, aphthous stomatitis, pharyngitis, adenitis syndrome (PFAPA), Blau syndrome, Behçet's syndrome, Schnitzler syndrome, systemic juvenile idiopathic arthritis (SJIA), and cryopyrin associated periodic syndrome (CAPS) including Muckle-Wells syndrome, and familial cold autoinflammatory syndrome
  - h. Others: hemochromatosis, hyperlipidemic arthropathy, myositis ossificans progressiva, Wilson's disease, others
14. Non-articular and regional musculoskeletal disorders
  - a. Fibromyalgia
  - b. Myofascial pain syndromes
  - c. Axial syndromes: low back pain, spinal stenosis, intervertebral disc disease and radiculopathies, cervical pain syndromes, coccydynia, osteitis condensans ilii, osteitis pubis, spondylolisthesis/spondylolysis, discitis
  - d. Regional musculoskeletal disorders: in addition to bursitis, tendinitis, or enthesitis occurring around each joint, other characteristic disorders occurring at each specific joint site (e.g., shoulder-rotator cuff tear, subacromial bursitis, adhesive capsulitis, impingement syndrome; wrist-ganglions, De Quervain's tenosynovitis; trigger fingers/stenosing tenosynovitis, Dupuytren's contractures; knee-synovial plica syndrome, internal derangements, popliteal cyst; foot/ankle-plantar fasciitis, Achilles tendinitis, Morton's neuroma; other-temporomandibular joint syndromes; costochondritis)
  - e. Biomechanical/anatomic abnormalities associated with regional pain syndromes: scoliosis and kyphosis, genu valgum, genu varum, leg length discrepancy, foot deformities
  - f. Overuse rheumatic syndromes: occupational, sports, recreational, performing artists
  - g. Sports medicine: injuries, strains, sprains, nutrition, medication issues
  - h. Entrapment neuropathies: thoracic outlet syndrome, upper extremity entrapments, lower extremity entrapments
  - i. Other: peripheral neuropathies (polyneuropathy, small fiber neuropathy), mononeuritis multiplex, complex regional pain syndrome (formerly reflex sympathetic dystrophy), erythromelalgia
15. Neoplasms and tumor-like lesions
  - a. Benign



- i. Joints: loose bodies, fatty and vascular lesions, synovial osteochondromatosis, pigmented villonodular synovitis, ganglions
      - ii. Tendon sheaths: fibroma, giant cell tumor, nodular tenosynovitis
      - iii. Bone: osteoid osteoma
    - b. Malignant
      - i. Primary: synovial sarcoma, osteoid sarcoma, chondrosarcoma
      - ii. Secondary: leukemia, myeloma, metastatic malignant tumors
      - iii. Malignancy-associated rheumatic syndromes: carcinomatous polyarthritis, palmoplantar fasciitis, Sweet's syndrome, paraneoplastic presentations of rheumatic diseases
16. Muscle diseases
- a. Acquired muscle diseases
    - i. Autoimmune
      - (1) Polymyositis
      - (2) Dermatomyositis
      - (3) Myositis with other connective tissue diseases
      - (4) Immune-mediated necrotizing myositis
      - (5) Others (ocular/orbital myositis, focal/nodular myositis, eosinophilic myositis, granulomatous myositis)
      - (6) Inclusion body myositis
    - ii. Endocrine disorders
    - iii. Drugs/Toxins
    - iv. Others (critical illness myopathy, infections, amyloid, paraneoplastic)
  - b. Inherited muscle diseases
    - i. Metabolic myopathies
      - (1) Glycogen storage diseases
      - (2) Lipid metabolism disorders
      - (3) Mitochondrial myopathies
    - ii. Muscular dystrophies
    - iii. Muscle channelopathies
  - c. Myasthenia gravis
17. Rheumatic diseases in special populations
- a. Geriatric population
  - b. Pregnant women
  - c. Dialysis patients
  - d. Transplant patients
18. Miscellaneous rheumatic disorders
- a. Amyloidosis: primary, secondary, hereditary
  - b. Primary Raynaud phenomenon
  - c. IgG4-related disease
  - d. Retroperitoneal fibrosis
  - e. Charcot joint
  - f. Remitting seronegative symmetrical synovitis with pitting edema (RS3PE)
  - g. Multicentric reticulohistiocytosis
  - h. Sarcoidosis
  - i. Intermittent arthritides: palindromic rheumatism, intermittent hydrarthrosis
  - j. Arthritic and rheumatic syndromes associated with: plant thorn synovitis, scurvy, pancreatic disease, primary biliary cirrhosis, drugs, and environmental agents

## B. Pediatric rheumatic diseases

Some rheumatic diseases can share similar aspects of pathogenesis, presentation, clinical course, and treatment in adults and children. These diseases (such as systemic lupus, scleroderma spectrum diseases, the systemic vasculitides, and enteropathic arthritides) are not specifically addressed in this section. Other diseases or specific aspects thereof that are unique or more prevalent in children are included in this outline of knowledge content. A supplementary section, providing more detailed information is provided in Appendix E.

1. Rheumatic diseases that occur primarily in children: diagnosis and recognition of how they both differ from the same or share similar aspects with disease in adults.
  - a. Juvenile idiopathic arthritis (JIA)
    - i. Systemic Onset
    - ii. Oligoarticular
    - iii. Polyarthritis (RF positive, RF negative)
    - iv. Enthesitis-related
    - v. Psoriatic arthritis
    - vi. Undifferentiated arthritis
  - b. Juvenile dermatomyositis
  - c. Kawasaki Disease
  - d. IgA Vasculitis (formerly known as Henoch-Schonlein Purpura, HSP)
  - e. Acute rheumatic fever
  - f. Neonatal lupus syndrome
  - g. Autoinflammatory syndromes: familial Mediterranean fever (FMF), hyperimmunoglobulinemia D syndrome (HIDS), tumor necrosis factor receptor-associated periodic syndromes (TRAPS), periodic fever, aphthous stomatitis, pharyngitis, adenitis syndrome (PFAPA), deficiency of interleukin-1 receptor agonist (DIRA), Majeed syndrome, chronic recurrent multifocal osteomyelitis (CRMO), pyogenic sterile arthritis, pyoderma gangrenosum and acne syndrome (PAPA), Schnitzler syndrome, Blau syndrome (NOD2/CARD15), chronic atypical neutrophilic dermatosis with lipodystrophy and elevated temperature (CANDLE) syndrome, Behçet's syndrome, systemic juvenile idiopathic arthritis (SJIA), and cryopyrin associated periodic syndrome (CAPS) including Muckle-Wells syndrome, familial cold autoinflammatory syndrome, and neonatal-onset multisystemic inflammatory disease (NOMID)
2. Major sequelae and life-threatening complications of rheumatic diseases that occur primarily in children:
  - a. Systemic onset JIA
    - i. Hemophagocytic lymphohistiocytosis/Macrophage activation syndrome
    - ii. Cardiac tamponade
  - b. Pauciarticular JIA
    - i. Chronic uveitis
  - c. Juvenile dermatomyositis
    - i. GI vasculitis
    - ii. Calcinosis
    - iii. Joint contractures
  - d. Kawasaki Disease
    - i. Aneurysms of coronary and other arteries
  - e. IgA Vasculitis (formerly known as Henoch-Schonlein Purpura, HSP)
    - i. GI- intussusception, intestinal infarction
    - ii. Renal - chronic nephritis

- f. Neonatal lupus syndrome
    - i. Congenital heart block
    - ii. Thrombocytopenia
- 3. Appropriate treatments of the above childhood rheumatic disorders and complications of treatment.
- 4. Non-rheumatic disorders in children that can mimic rheumatic diseases:
  - a. Infectious or post-infectious syndromes
    - i. Septic arthritis and osteomyelitis
    - ii. Transient (toxic) synovitis of the hip
    - iii. Post-infectious arthritis and arthralgia
    - iv. Post-viral myositis
  - b. Orthopedic conditions
    - i. Legg-Calve-Perthes disease and other avascular necrosis syndromes
    - ii. Slipped capital femoral epiphysis
    - iii. Spondylolysis and spondylolisthesis
    - iv. Patellofemoral syndrome
  - c. Non-rheumatic pain
    - i. Benign limb pains of childhood (“growing pains”)
    - ii. Benign hypermobility syndrome
  - d. Neoplasms
    - i. Leukemia
    - ii. Lymphoma
    - iii. Primary bone tumors (especially osteosarcoma and Ewing’s sarcoma)
    - iv. Tumors metastatic to bone (especially neuroblastoma)
  - e. Bone and cartilage dysplasias, and inherited disorders of metabolism (Marfan syndrome, osteogenesis imperfecta, Ehlers-Danlos syndrome, pseudoxanthoma elasticum, hypermobility syndrome)
- 5. Non-articular rheumatism
  - a. Fibromyalgia
  - b. Pain amplification syndromes
  - c. Complex regional pain syndrome
- 6. Special considerations in childhood of rheumatic diseases and treatments:
  - a. Disease effects on growth
    - i. Accelerated or decelerated growth of limbs or digits affected by arthritis
    - ii. Altered growth of mandible in TMJ arthritis
    - iii. Short stature and failure to thrive
  - b. Regular surveillance for uveitis in JIA
  - c. Drugs
    - i. FDA approved drugs for childhood rheumatic diseases
    - ii. Pediatric dosing and special considerations in terms of pharmacokinetics and drug metabolism
  - d. Child-specific side effects of chronic glucocorticoid treatment
    - i. Growth retardation
    - ii. Delay of puberty
  - e. Physical and occupational therapy
    - i. Exercises
    - ii. Splinting
  - f. Psychosocial and developmental issues
    - i. Peer and sibling interaction

- ii. Family adjustment
- iii. School accommodations for disability
- iv. School and recreational activities
- g. Transition to adulthood
  - i. Transition of care

C. Therapeutic modalities and strategies

1. Pharmacology: for each medication, the dosing, pharmacokinetics, metabolism, mechanisms of action, side effects, drug interactions, compliance issues, costs, and use in specific patient populations, such as chronic kidney disease and including fertile, lactating, and pregnant women and fertile men as well as across the age spectrum
  - a. Nonsteroidal anti-inflammatory drugs
  - b. Glucocorticoids: topical, intra-articular, systemic
  - c. Systemic anti-rheumatic drugs
    - i. DMARDs, small molecules: anti-malarials, sulfasalazine, methotrexate, leflunomide, azathioprine, cyclophosphamide, mycophenolate, calcineurin inhibitors, JAK kinase inhibitors, phosphodiesterase inhibitors
    - ii. Biologic agents: interleukin inhibitors (1, 6, 12, 17, 23), tumor necrosis factor inhibitors, T cell co-stimulatory inhibitors, anti-B cell therapy
    - iii. Historical agents such as gold compounds
  - d. Urate lowering therapy:
    - i. Xanthine oxidase inhibitors: allopurinol, febuxostat
    - ii. Uricosuric: probenecid
    - iii. Uricase agents: pegylated uricase, rasburicase
  - e. Bone disorder medications
    - i. Bisphosphonates: alendronate, risedronate, ibandronate, zoledronic acid
    - ii. Anabolic agents: teriparatide
    - iii. RANKL inhibition: denosumab
    - iv. Hormonal therapy: estrogen, selective estrogen receptor modulators, calcitonin
    - v. Calcium and Vitamin D
  - f. Vasodilators
    - i. Calcium channel blockers
    - ii. Topical nitrates
    - iii. Prostacyclin analogs
    - iv. Endothelin receptor antagonists
    - v. Phosphodiesterase inhibitors
    - vi. Guanylate cyclase agonist
  - g. Antibiotic therapy for septic joints
  - h. Opioid and non-opioid analgesics
    - i. Colchicine
  - j. Agents used for pain modulation: anti-depressants, anti-convulsants, pregabalin, muscle relaxants
  - k. Anti-cholinergics and non-pharmacologic agents used for the treatment of sicca symptoms
  - l. Vaccines
  - m. Intravenous immunoglobulin (IVIG)
  - n. Plasma exchange
  - o. Rehabilitation and disability Multidisciplinary approaches to rehabilitation and pain control: appropriate use of and referral/prescription to rehabilitation specialists and pain clinics
  - p. Methods of rehabilitation: for each method, principles, mechanism of action, indications, precautions and contraindications, potential side effects, and costs

- i. Exercise
  - ii. Rest and splinting
  - iii. Thermal Modalities
    - (1) Ultrasound
    - (2) Phoresis
    - (3) Spa therapy
    - (4) Icing
  - q. Adaptive equipment and assistive devices
  - r. Footwear and orthotics
- 2. Surgical and perioperative management
  - a. For each procedure, the fellow should demonstrate a working knowledge of indications, pre-operative evaluation and medication adjustments, contraindications, complications, postoperative management, and expected outcome.
    - i. Bone biopsy
    - ii. Arthroscopy
    - iii. Synovectomy of tendons and joints
    - iv. Entrapment neuropathy release
    - v. Osteotomies: hip, knee
    - vi. Arthrodesis
    - vii. Spine surgery: radiculopathy, stenosis, and instability
    - viii. Reconstructive surgery of hand and foot
    - ix. Total joint replacement
    - x. Specific surgical management problems:
      - (1) Patient with rheumatoid arthritis
      - (2) Infected joint: arthroscopy vs. arthrotomy
      - (3) Infected prosthetic joint
      - (4) Patient with ankylosing spondylitis
      - (5) Pediatric patient with rheumatic disease
      - (6) Prevention and treatment of deep venous thrombosis
      - (7) Peri-operative anti-rheumatic medication management
- 3. Complementary and alternative medical practices, including but not limited to: diet, nutritional supplements, acupuncture, chiropractic

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## DIAGNOSTIC TESTING

- A. Laboratory tests: rationale, methods for performing, and utility/limitations of specific laboratory tests including but limited to:
  - 1. Erythrocyte sedimentation rate, C-reactive protein, and other acute phase reactants
  - 2. Rheumatoid factors, cryoglobulins, and circulating immune complexes
  - 3. Anti-cyclic citrullinated peptide antibodies
  - 4. Antibodies against nuclear antigens: ANA, anti-dsDNA, anti-Smith, anti-SSA, anti-SSB, anti-U1 RNP, anti-centromere, anti-histone, anti-ribosomal P, anti-topoisomerase 1, anti-RNA Polymerase III and LE cell preparation
  - 5. Myositis-specific (anti-Jo-1 and other anti-synthetases, anti-Mi-2, anti-SRP, anti-HMGCR [200/100], anti-TIF1-gamma [p155/140], anti-MJ [NXP-2], anti-CADM-140 [MDA-5], anti-SAE) and myositis-associated (anti-U1RNP, anti-Ku, anti-PM-Scl) antibodies
  - 6. Other disease-associated auto-antibodies; anti-mitochondrial, anti-smooth muscle, anti-neuronal
  - 7. Anti-neutrophil cytoplasmic antibodies (anti-proteinase 3, anti-myeloperoxidase)

8. Anti-phospholipid antibodies including RPR, lupus anticoagulant, anti-cardiolipin and beta-2-glycoprotein I
  9. Antibodies to formed blood elements including direct and indirect Coombs testing, anti-platelet antibodies, anti-granulocyte antibodies
  10. Assays for complement activity (CH50) and components of the complement cascade
  11. Serum immunoglobulin levels, serum protein electrophoresis and immunofixation electrophoresis
  12. HLA typing
  13. ASO and other streptococcal antibody tests
  14. Serologic and PCR tests for Lyme disease, HIV, Hepatitis B, Hepatitis C, parvovirus, chikungunya and other infectious agents
  15. Serum and urine measurements for uric acid
  16. Iron studies including ferritin
  17. Flow cytometry studies for analysis of lymphocyte subsets and function
  18. Specific genetic testing
- B. Diagnostic imaging techniques: basic underlying principles and technical considerations in the use of plain radiographs, computed tomography, magnetic resonance imaging, ultrasonography and radionuclide scanning of bones, joints, periarticular and vascular structures.
  - C. Synovial fluid analysis: cell count and differential, crystal identification, viscosity, and other special stains/analyses
  - D. Laboratory test-performance characteristics: principles of sensitivity, specificity, predictive value, and likelihood ratios

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## RESEARCH PRINCIPLES

- A. Basic Science Research: Fellows should demonstrate a basic knowledge of the research principles of basic science research and the process of scientific experimentation and hypothesis testing including:
  1. Generating an experimental question and hypothesis
  2. Experimental design
    - a. Designation of experimental and control group
    - b. Choice of appropriate controls
    - c. Replication of results to assure reliability and validity
  3. Laboratory techniques commonly used in research related to rheumatic diseases – basic understanding of methods
    - a. Clinical: ELISA, RIA, nephelometry, protein electrophoresis, multiplex bead-based immunoassays
    - b. Cellular: cell lines, lymphocyte proliferation, flow cytometry, fluorescence activated cell sorting (FACS), confocal microscopy
    - c. Immunohistochemistry and immunofluorescence of tissues.
    - d. Molecular: Western blot analysis, polymerase chain reaction; gene sequencing; genomics techniques (GWAS, SNPs, microarray techniques), proteomics technique
    - e. Hybridoma and monoclonal antibody production
    - f. Mouse models: transgenic, knock-out/knock-in, chimeras
  4. Statistical methods and reporting
    - a. ANOVA, ANCOVA
    - b. Statistical significance and sample size
    - c. Data management, entry, security
- B. Clinical Research: the principles of research involving patients in order to answer clinically relevant questions, recognizing the limitations and biases of each
  1. Generating an experimental question and hypothesis

2. Research study design – distinguish the critical components of clinical studies
    - a. Clinical trial design
      - i. Phase I clinical trials
      - ii. Phase IIa and IIb clinical trials
      - iii. Phase III clinical trials
      - iv. Randomized, double-masked, placebo-controlled trial
      - v. Cross-over trial designs
      - vi. Randomized discontinuation trial
      - vii. Open-label extensions
    - b. Design
  3. Inclusion and exclusion criteria
  4. Concept of equipoise and its impact on study design
  5. Statistical methods and reporting
    - a. Sensitivity and specificity calculations
    - b. Odds ratios, hazards ratio, relative risk, number needed to treat, number needed to harm
    - c. Statistical significance, sample size, and power calculations
    - d. Data management, entry, security
- C. Epidemiological and health services research: Fellows should recognize how research is done with regard to the ways in which advances in medical knowledge lead to optimal management of local and global populations.
1. Epidemiology study design
    - a. Types: Retrospective, case series, case-control, cohort, cross-sectional
    - b. Analysis: incidence, prevalence, correlation, predictive variables
  2. Outcomes measures
    - a. Patient reported outcomes (e.g. SF36, WOMAC, global assessments)
    - b. Disease activity indices (e.g. DAS, RAPID3, CDAI, SLEDAI, BASDAI, PASI, and others)
    - c. Composite indices (e.g. BILAG, ACR Composite)
  3. Quality improvement science
    - a. Plan-Do-Study-Act (PDSA) cycle
    - b. Team leadership skills
  4. Comparative effectiveness research
    - a. Systematic review
    - b. Cost analysis (direct costs, QALY)
- D. Research Ethics
1. Guiding principles
    - a. Nuremberg code
    - b. Declaration of Helsinki
    - c. Belmont Report
  2. Independent review
    - a. Institutional Review Boards (IRB)
    - b. Data safety monitoring boards
  3. Informed consent
  4. Data management
    - a. Confidentiality
    - b. Documentation
  5. Data security
- E. Critical literature review
1. Evidence based medicine principles
  2. Critical appraisal of the literature

## II. PATIENT CARE

The ability to provide quality patient care is the ultimate goal of clinical training in rheumatology. The fellowship program must require its trainees to attain competence in patient care to the level expected for independent practice, as defined by the Rheumatology Entrustable Professional Activities (EPA's) (Appendix B). Programs must define the specific knowledge, skills, behaviors, and attitudes required, as well as provide educational experiences as needed in order for their trainees to demonstrate quality patient care.

### **DEFINITION**

Patient Care that is compassionate, appropriate, and effective for the treatment of disease and the promotion of health.

### **ESSENTIAL COMPONENTS**

The essence of being a rheumatologist is the ability to use information derived about a patient (history, physical examination, laboratory and imaging studies) along with medical knowledge to orderly synthesize a differential diagnosis, plan of further evaluation and comprehensive management for the patient being evaluated for rheumatic disease or rheumatic disease manifestations. The rheumatologist should provide consultation when requested, in support of the primary care relationship, for patients with rheumatic symptoms and signs and appropriately integrate recommendations from other health care providers into the evaluation and management plan.

This may broadly be categorized under four components:

#### **COMPONENT 1 - INFORMATION GATHERING**

The fellow should be able to:

1. Obtain an accurate and comprehensive but relevant clinical history, including review of all available records.
2. Perform a thorough and relevant review of systems, and assess functional status of patients with rheumatic disease symptoms.
3. Perform and interpret a comprehensive, accurate physical examination, using common and advanced techniques, where applicable.
4. Perform and interpret the examination of all axial and peripheral joints, peri-articular structures, peripheral nerves and muscles.
5. Identify extra-articular findings that are associated with specific rheumatic diseases.
6. Recognize the indications for and costs of ordering laboratory tests and procedures to establish a diagnosis of rheumatic disease
7. Recognize the indications for and costs of different therapies used in the management of rheumatic diseases.
8. Recognize the indications for and demonstrate competence in arthrocentesis, joint and soft tissue injections. The fellow should be able to distinguish the anatomy, precautions (including OSHA requirements) and potential sequelae of arthrocentesis and demonstrate competency in obtaining synovial fluid from diarthrodial joints, bursae and tenosynovial structures after obtaining informed consent from the patient or caregiver.
9. Perform synovial fluid analysis including the examination and interpretation of synovial fluid under conventional and polarized light microscopy from patients with a variety of rheumatic diseases.



10. Obtain and interpret appropriate tests, including laboratory tests, imaging studies, and other indicated testing to evaluate patients presenting with known or possible rheumatic disease:
  - a. Radiographs of normal and diseased joints, bones, peri-articular structures and prosthetic joints
  - b. Bone densitometry
  - c. Arthrography, ultrasonography, computed tomography, magnetic resonance imaging of joints, bones, peri-articular structures and muscle
  - d. Radionuclide scans of bones and joints
  - e. Arteriograms (conventional, CT and MR) for patients with suspected or confirmed vasculitis
  - f. Computed tomography of lungs and paranasal sinuses
  - g. Magnetic resonance imaging of the central nervous system (brain and spinal cord)
  - h. Electromyograms and nerve conduction studies
  - i. Biopsy specimens including histochemistry and immunofluorescence of tissues relevant to the diagnosis of rheumatic diseases: skin, synovium, muscle, nerve, bone, minor salivary gland, artery, kidney and lung
  - j. Specific laboratory tests : See Medical Knowledge, Clinical Sciences, Diagnostic Testing A (*vide supra*)
  - k. Arthroscopy
  - l. Schirmer's and tests of corneal integrity; parotid scans and salivary flow studies

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## COMPONENT 2 - SYNTHESIS OF TREATMENT PLAN

Informed medical decision-making based on current scientific information and clinical judgment that also accounts for patient preferences and circumstances.

The fellow should be able to:

1. Construct a differential diagnosis in patients presenting with signs and symptoms related to rheumatologic diseases and to outline further testing necessary to establish the correct diagnosis
2. Construct and implement an appropriate treatment plan for the care of a patient with a rheumatologic problem integrating the prescribing of medications (oral, injectable or infused), counseling and psychosocial aspects, rehabilitative medicine, and, when necessary, surgical or other consultation. The fellow should be able to explain the rationale as well as the risks and benefits for the treatment plan
3. Formulate and implement a management plan for patients with rheumatic emergencies (including organ or life threatening conditions), with a need for emergent, urgent or changes in level or goals of care
4. Recognize disease-related exacerbations and formulate and implement a management plan
5. Refer to, or consult with other health care providers for the co-management of patients with rheumatic disease
6. Identify opportunities for referral to clinical registries and trials

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## COMPONENT 3 - IMPLEMENTATION OF TREATMENT

- A. Prescribing medications and rehabilitation

The fellows should be able to:

Demonstrate a working knowledge of clinical pharmacology including the dosing, pharmacokinetics, metabolism, mechanisms of action, side effects, drug interactions, compliance issues, costs, and use in specific patient populations, such as chronic kidney disease and including fertile, lactating, and pregnant women and fertile men as well as across the age spectrum.

1. Nonsteroidal anti-inflammatory drugs and adequate gastroprotection
2. Glucocorticoids: topical, intra-articular, systemic
3. Systemic anti-rheumatic drugs
  - a. DMARDs, small molecules: anti-malarials, sulfasalazine, methotrexate, leflunomide, azathioprine, cyclophosphamide, mycophenolate mofetil, calcineurin inhibitors, JAK kinase inhibitors, phosphodiesterase inhibitors
  - b. Biologic agents: interleukin inhibitors (1, 6, 12, 17, 23), tumor necrosis factor inhibitors, T cell co-stimulatory inhibitors, anti-B cell therapy
  - c. Historical agents such as gold compounds
4. Urate lowering therapy:
  - a. Xanthine oxidase inhibitors: allopurinol, febuxostat
  - b. Uricosuric: probenecid
  - c. Uricase agents: pegylated uricase, rasburicase
5. Bone disorder medications
  - a. Bisphosphonates: alendronate, risedronate, ibandronate, zoledronic acid
  - b. Anabolic agents: teriparatide
  - c. RANKL inhibition: denosumab
  - d. Hormonal therapy: estrogen, selective estrogen receptor modulators, calcitonin
  - e. Calcium and Vitamin D
6. Vasodilators
  - a. Calcium channel blockers
  - b. Topical nitrates
  - c. Prostacyclin analogs
  - d. Endothelin receptor antagonists
  - e. Phosphodiesterase inhibitors
  - f. Guanylate cyclase agonist
7. Antibiotic therapy for septic joints
8. Opioid and non-opioid analgesics
9. Colchicine
10. Agents used for pain modulation: anti-depressants, anti-convulsants, pregabalin, muscle relaxants
11. Anti-cholinergics and non-pharmacologic agents used for the treatment of sicca symptoms
12. Vaccines
13. Intravenous immunoglobulin (IVIg)
14. Plasma exchange

**B. Pain assessment and pain management**

The fellow should be able to utilize:

1. Methods of pain assessment including visual analog scale scores, pain questionnaires
2. Non-pharmacological modalities of pain management including exercise, cognitive behavioral therapy
3. Pharmacological therapy including:
  - a. Immunosuppressive and anti-inflammatory management of underlying rheumatic disorder.
  - b. Analgesic agents including acetaminophen, nonsteroidal anti-inflammatory agents and narcotic analgesics.
  - c. Antidepressants
4. Means to identify physical impairment; relate the impairment to the observed functional deficits; prescribe appropriate rehabilitation (physical therapy, occupational therapy) to achieve goals to improve the defined impairment.

C. Surgical management

The fellow should be able to:

1. Distinguish indications for surgical and orthopedic consultation in acute and chronic rheumatic diseases.
2. Perform peri-operative management of the surgical patient:
  - a. Peri-operative evaluation, appropriate referral and medication adjustments.
  - b. Rehabilitation of the patient with rheumatic disease after a surgical or orthopedic procedure, as well as aspects of post-operative medical management pertaining to the rheumatologic condition.

D. Non-pharmacologic management

The fellow should be able to:

1. Describe complementary and unconventional medical practices: diet, nutritional supplements, antimicrobials, acupuncture, topical therapeutic agents, homeopathic remedies, venoms, and others.
2. Perform patient education and counseling

E. Preventive medicine and proactive care

The fellow should be able to:

1. Appropriately assess and manage of bone health in a patient starting or taking glucocorticoid therapy
2. Counsel for risk factor modification for patients at risk for fracture
3. Recognize the importance of lipid panel monitoring in patients with rheumatic disease
4. Appropriately implement prophylaxis against pneumocystis pneumonia
5. Counsel for tobacco cessation
6. Appropriately screen for risk for reactivation of infectious diseases (viral hepatitis, tuberculosis) in patients beginning disease modifying, small molecules or biologic therapy
7. Counsel for appropriate dental evaluation and management
8. Counsel for appropriate vaccination administration

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## COMPONENT 4 - REASSESSMENT AND PATIENT FOLLOW UP

The fellow should be able to:

1. Reassess the patient over time, including recognition of treatment related adverse events, and alter the treatment plan accordingly.
2. Utilize the validated instruments in the assessment of pain, disease activity, function, and quality of life over time to monitor and adjust therapy
3. Address comorbid illness in patients with rheumatic diseases and incorporate these considerations into the care plan
4. Enumerate disease- and treatment-related complications that may lead to long term morbidity, considering implications of comorbid diseases and effects of aging

### III. PRACTICE-BASED LEARNING AND IMPROVEMENT

The practice of rheumatology entails the assessment and treatment of patients with clinical disorders that are often complex with regard to the different organ systems involved, variations in musculoskeletal and immune system biology, and impact upon patient lifestyle and livelihood. The rapid advances in understanding and the complexity of both disease pathogenesis and treatment of the rheumatic diseases demand that the rheumatologist continually evaluate and improve the quality of his/her care in the context of his/her own clinical practice. The development of skills in self-directed, reflective learning and practice improvement will facilitate the delivery of state-of-the-art, evidence-based patient care that maximizes the likelihood for successful clinical outcomes.

#### **DEFINITION**

Practice-based learning and improvement involves the evaluation of care provided to both individual patients as well as to groups of patients in a given practice, the appraisal and assimilation of scientific evidence relevant to clinical problems encountered, evaluations of the care provided in the context of this evidence, and effecting improvements in patient care based upon these evaluations.

#### **ESSENTIAL COMPONENTS**

In addition to structured learning of the basic components of medical knowledge and patient care, the rheumatologist must evaluate his/her knowledge base and care delivery on an ongoing basis with the goal of continually improving that care. This process includes the following components:

- A. Independent Learning - The fellow should be able to:
  1. Learn and improve at the point of care to enhance future clinical interactions
  2. Seek resources to enhance future clinical interactions.
  3. Recognize, and implement ways to improve his/her role in the effective management of a practice.
  4. Incorporate technology to manage information (HIPAA compliant), support patient care decisions using evidence-based medicine and enhance both patient and physician education
- B. Self-evaluation of performance - The fellow should be able to:
  1. Monitor practice with goal for improvement
  2. Honestly reflect on knowledge, skills or attitude gaps to guide ongoing learning, using internal and external sources
  3. Actively seek, reflect on, and develop plans for practice improvement based on feedback from all members of the health care team including faculty, peers, students, health professionals, patients and patient advocates.
- C. Incorporation of feedback into improvement of clinical activity - The fellow should be able to:
  1. Demonstrate that s/he learns from errors through actions taken to improve the system or processes of care.
  2. Display the ability to change practice based on an audit of a panel of patients using standardized, disease specific, and evidence based criteria.
  3. Independently construct and pursue answers to clinical questions, and perform self-reflection to incorporate learning for future clinical encounters.
  4. Demonstrate the ability to respond to meet situational needs, and customize management based on clinical evidence for individualized patient care.
- D. Incorporation of feedback into improvement of clinical activity - The fellow should be able to:
  1. Demonstrate that s/he learns from errors through actions taken to improve the system or processes of care.

2. Display the ability to change practice based on an audit of a panel of patients using standardized, disease specific, and evidence based criteria.
3. Independently construct and pursue answers to clinical questions, and perform self-reflection to incorporate learning for future clinical encounters.
4. Demonstrate the ability to respond to meet situational needs, and customize management based on clinical evidence for individualized patient care.

## IV. SYSTEMS-BASED PRACTICE

The increasing complexity and diversity of health care delivery systems presents both challenges and opportunities for the practice of rheumatology. Knowledge of the nature and variety of the external and internal systems that can impact clinical practice and the effective utilization of that knowledge to positively impact patient care is an essential skill. It is important for trainees to both recognize how their own practices intersect with others, and to work in teams to improve health care delivery.

The knowledge base of systems-based practice comprises the advantages and disadvantages of different health care systems that impact patients with rheumatic diseases. Some of these include the academic system in which rheumatology fellows are training, the various private and public health care delivery systems, the governmental agencies and programs that regulate these systems, the volunteer, private and governmental agencies that are available to educate and assist patients, the challenges faced by disabled patients negotiating these systems and the social and economic burden of chronic rheumatic diseases. The goal of the systems-based practice curriculum is to enhance the ability of rheumatology trainees to positively influence patient care by effectively utilizing these internal and external resources, to serve as effective advocates for their patients, and to provide cost-effective patient care. In some cases this may also mean identifying and organizing changes in the local systems' problems that can improve patient care.

### **DEFINITION**

Systems-based practice reflects an understanding of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

## ESSENTIAL COMPONENTS

- A. Partners in health care delivery: the various providers and resources available to deliver optimal care.

This partnership starts with coordinating both a multidisciplinary and interprofessional approach to patient-centered care. The principal partners in delivering health care to patients with rheumatic diseases include providers such as administrative and nursing staff, referring and consulting physicians, nurse practitioners, physician assistants and other health professionals participating in the local health care system. Partners also include outside volunteer agencies, both locally and nationally, such as the American College of Rheumatology, Association of Rheumatology Health Professionals, the Rheumatology Research Foundation, the Arthritis Foundation, the disease-specific foundations (including but not limited to Lupus, Scleroderma, Ankylosing Spondylitis, Vasculitis), the National Institute of Health (NIH) and its component institutes and pharmaceutical companies that have specific patient-related initiatives. Other agencies that have impact on the practice of rheumatology include the American Medical Association (AMA), the Food and Drug Administration (FDA) and the Center for Medicare and Medicaid Services (CMS).

Working within interprofessional and interdisciplinary teams, rheumatologists should work to promote patient safety. It is also important to identify risks for and strategies to prevent medical errors and to

address them appropriately if they occur.

B. Systems thinking: a concept of “systems thinking” in health care delivery

This includes an appreciation for the spectrum of practice models for health care delivery (academic/public/private/Veterans Affairs) including the fundamentals of office and personnel management, practice management strategies, managed care, health insurance, appropriate coding and reimbursement policies.

It also comprises an ongoing analysis of the limitations and opportunities within the local health care system, in both the inpatient and outpatient settings, and its impact on the health care delivery to patients with rheumatic diseases. In particular, efforts should be made to identify potentially correctable systems’ weaknesses and medical errors due to systems’ failures and to develop strategies to rectify the problems (i.e. quality improvement projects).

Systems thinking includes implementing strategies to coordinate care and transition patients safely and efficiently across multiple delivery systems, including ambulatory, sub-acute, acute, rehabilitation and skilled nursing facilities.

C. Advocacy for the patient: the importance, opportunities and limits of patient advocacy

This advocacy includes assisting patients with applications for medical disability determinations, completing preauthorization documents for the use of certain medications and appealing to insurance companies with respect to denial of certain treatments, benefits and claims.

It is also important to recognize opportunities to address disparities in disease and in health care delivery impacting patient care, including socio-economic factors, health care literacy, medical disability and health care insurance coverage.

Activities may include broader advocacy for populations on a local, state or national level.

D. Cost-effective health care: the principles of cost allocation and resource management within the external (state, national) and local systems

The delivery of cost-effective health care includes realizing how the cost and availability of certain diagnostic tests, drugs and other therapies impact patient care. The utilization of evidence-based cost-conscious best practice strategies for the diagnosis and treatment of patients with rheumatic diseases is paramount.

## V. INTERPERSONAL AND COMMUNICATION SKILLS

Interpersonal and communication skills are essential for the formation of a desirable and effective physician-patient relationship. The complexity of most of the rheumatic diseases, as well as the increasingly complicated treatment regimens, require a working partnership between patient and physician, and often between both physician and the patient's family or caregiver(s), as well as physician and members of an interprofessional team of providers. In addition to improved patient satisfaction, confidence and understanding, such working partnerships promote medical compliance. Effective physician collegial relationships are also dependent upon these skills.

### **DEFINITION**

Interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and other health professionals.

## ESSENTIAL COMPONENTS

- A. **Gathering information**  
Reliable and effective communication depends upon the availability of accurate and complete information obtained from patients, their families, other health professionals, and the complete medical record. This requires the use of effective listening and communication skills.
- B. **Recognizing and incorporating the patient's perspective**  
Such understanding impacts the ability of the physician to appreciate the functional impact of disease and the desire and ability of the patient to be an active partner in decision-making and treatment efforts. Evaluation and management plans should demonstrate sensitivity to, and integrate differences in patient characteristics.
- C. **Providing information**  
Communication regarding disease manifestations, diagnosis and treatment is only effective if the recipient has gained appropriate understanding of the information at the end of the exchange. Effective explanation and documentation therefore require that the physician communicate in a manner that is clear and is adjusted to the specific context, situation, and/or audience.
- D. **Trust**  
Establishment of trust with the patient, the patient's family or caregiver(s), and other health professionals is paramount.

## VI. PROFESSIONALISM

Professionalism is one of the foundations of the practice of medicine. By virtue of their prior medical school education and internal medicine training, rheumatology fellows have typically already attained a substantial level of professionalism, which can be further enriched during the fellowship training period. The complexity of rheumatic diseases and their management requires effective interactions between rheumatology trainees and referring providers, subspecialty consultants, other health care providers, hospital administrators and health insurance representatives in providing care for their patients. Trainees in many programs interact with patients from a wide range of cultural and socioeconomic backgrounds. In addition, fellows must learn to recognize and manage potential conflicts of interest with professional activities as well as with pharmaceutical companies (i.e. clinical research trials, pharmaceutical company interactions, grant review processes). A high level of professionalism is thus essential to maintain the balance required by an effective rheumatologist.

### DEFINITION

Professionalism is manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to patients of diverse backgrounds.

### ESSENTIAL COMPONENTS

#### A. Primacy of patient interest

Placing the interest of the patient before all other external interests is the most fundamental aspect of the medical profession and forms part of the unwritten contract in the patient-physician relationship.

This primacy also implies patient autonomy in the determination of treatment. As a demonstration of patient advocacy, the fellow needs to respond to each patient's unique characteristics and needs. This includes but is not limited to:

1. Demonstrating empathy and compassion to all patients,
2. Addressing disparities in health care that may impact patient care, and
3. Taking responsibility for situations where public health supersedes individual privacy (e.g. reportable infectious diseases).

#### B. Physician responsibility and accountability

The practice of medicine incurs responsibility and accountability to patients, colleagues, society, and self. The physician must maintain professional and respectful interactions with patients, caregivers, and members of the interprofessional team (e.g., peers, consultants, nursing, ancillary professionals, and support personnel).

1. To demonstrate commitment to providing safe patient care, the physician must recognize, respond to, and report either the impairment in colleagues, or the provision of substandard care, via a peer review process.
2. To demonstrate the professional attribute of accessibility, the physician accepts responsibility and follows through on tasks, including but not limited to completion of clinical, administrative, curricular and research-related tasks.
3. To demonstrate the professional attribute of personal accountability, the physician should contribute to the fiscally sound practice of medicine.
4. Physicians should responsibly use technology and social media.
5. To manage conflicts of interest the physician must maintain ethical relationships with patients, colleagues, members of the interprofessional team, office staff and industry.

#### C. Humanistic qualities and altruism

Physicians should treat patients with dignity, civility and respect, regardless of race, culture, gender, sexual orientation, socioeconomic status, literacy, and religious beliefs.



1. To demonstrate compassion and respect to patients and their caregivers, physicians should endeavor to support patients' needs (physical, psychological, social, and spiritual)

D. Ethical behavior

The physician must exhibit integrity and ethical behavior in professional conduct.

1. This includes, but is not limited to, accepting personal errors and honestly acknowledging them, maintaining patient confidentiality, upholding ethical expectations of clinical, scholarly and research activities, as well as maintenance of credentialing requirements.
2. The physician must address personal, psychological, and physical limitations that may affect professional performance.
3. Integrity must pervade all of the components of professionalism.

# APPENDICES

## APPENDIX A. INTERNAL MEDICINE SUBSPECIALTY REPORTING MILESTONES

# The Internal Medicine Subspecialty Milestones Project

*A Joint Initiative of*

The Accreditation Council for Graduate Medical Education  
and  
The American Board of Internal Medicine



*In Collaboration with*



October 2014

## Milestone Reporting

This document presents milestones designed for programs to use in semi-annual review of fellow performance and reporting to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME competencies that describe the development of competence from an early subspecialty learner up to and beyond that expected for unsupervised practice. In the initial years of implementation, the Review Committee will examine Milestone performance data for each program's fellows as one element in the Next Accreditation System (NAS) to determine whether fellows overall are progressing.

The Subspecialty Milestones are arranged in columns of progressive stages of competence that do not correspond with post-graduate year of education. For each reporting period, programs will need to review the Milestones, identify those that best describe a fellow's current performance, and ultimately select a box that best represents the summary performance for that sub-competency (see the figure on page v). Selecting a response box in the middle of a column implies that the fellow has substantially demonstrated those milestones, as well as those in previous columns. Selecting a response box on a line in between columns indicates that milestones in the lower columns have been substantially demonstrated, as well as some milestones in the higher column.

A general interpretation of each column for subspecialty medicine is as follows:

**Not Yet Assessable:** This option should be used only when a fellow has not yet had a learning experience in the sub-competency.

**Critical Deficiencies:** These learner behaviors are not within the spectrum of developing competence. Instead they indicate significant deficiencies in a fellow's performance.

**Column 2:** Describes behaviors of an early learner.

**Column 3:** Describes behaviors of a fellow who is advancing and demonstrating improvement in performance related to milestones.

**Ready for Unsupervised Practice:** Describes behaviors of a fellow who substantially demonstrates the milestones identified for a physician who is ready for unsupervised practice. This column is designed as the graduation target, but the fellow may display these milestones at any point during fellowship.

**Aspirational:** Describes behaviors of a fellow who has advanced beyond those milestones that describe unsupervised practice. These milestones reflect the competence of an expert or role model and can be used by programs to facilitate further professional growth. It is expected that only a few exceptional fellows will demonstrate these milestones behaviors.

For each ACGME competency domain, programs will also be asked to provide a summative evaluation of each fellow's learning trajectory.

## **Additional Notes**

The “Ready for Unsupervised Practice” milestones are designed as the graduation *target* but *do not* represent a graduation *requirement*. Making decisions about readiness for graduation is the purview of the fellowship program director (see the FAQ “Do you need to achieve a level of ‘ready for unsupervised practice’ in each competency to receive credit for each year?” in the Frequently Asked Questions document posted on the NAS section of the ACGME website for further discussion of this issue). Study of Milestone performance data will be required before the ACGME and its partners will be able to determine whether the “Ready for Unsupervised Practice” milestones and all other milestones are in the appropriate stage within the developmental framework, and whether Milestone data are of sufficient quality to be used for high stakes decisions.

**Listed below are the societies and members who have participated in the development of the Internal Medicine Subspecialty Reporting Milestones.**

**Chairs: Scott Gitlin, MD and John Flaherty, MD**

Accreditation Council of Graduate Medical Education: James Arrighi, MD; Susan Swing, PhD; Jerry Vasilias, PhD

Alliance for Academic Internal Medicine: D. Craig Brater, MD; Margaret Breida; Kelly Caverzagie, MD; Gregory C. Kane, MD; Consuelo Nelson Grier; Polly Parsons, MD; Bergitta Smith

American Academy of Hospice and Palliative Care Medicine: Laura Morrison, MD; Steven Radwany, MD; Timothy Quill, MD

American Academy of Sleep Medicine: Vishesh Kapur, MD; Becky Roberts; Michael Silber, MB ChB

American Association for the Study of Liver Diseases: Adrian Di Bisceglie, MD; Oren Fix, MD; Ayman Koteish, MD

American Association of Clinical Endocrinologists: Pasquale Palumbo, MD; Dace Trence, MD

American Board of Internal Medicine: Lee Berkowitz, MD; Eric Holmboe, MD; Sarah Hood; William Iobst, MD; Sharon Levin, MD; Sandra Yaich

American College of Cardiology: Jill Foster; Marcia Jackson, PhD; Jeff Kuvin, MD; Eric Williams, MD

American College of Chest Physicians: Doreen Addrizzo-Harris, MD; John Buckley, MD; Paul Markowski, CAE; Curtis Sessler, MD; Kenneth Torrington, MD

American College of Gastroenterology: Seth Richter, MD; Ronald Szyrkowski, MD

American College of Physicians: Patrick Alguire, MD; Molly Cooke, MD

American College of Rheumatology: Marcy Bolster, MD; Calvin Brown, MD

American Gastroenterological Association: Tamara Jones; Lori Marks, PhD; Darrell Pardi, MD; Suzanne Rose, MD; Brijen Shah, MD

American Geriatrics Society: Jan Busby-Whitehead, MD; Lisa Granville, MD; Rosanne Leipzig, MD

American Society of Clinical Oncology: Frances Collichio, MD; Marilyn Raymond, MD; Jamie Von Roenn, MD

American Society of Gastrointestinal Endoscopy: Diane Alberson; Walter Coyle, MD; Robert Sedlack, MD

American Society of Hematology: Linda Burns, MD; Charles Clayton; Karen Kayoumi; Elaine Muchmore, MD

American Society of Nephrology: Nancy Adams, MD; Raymond Harris, MD; Tod Ibrahim; Ryan Russell

American Society of Nuclear Cardiology: Brian Abbott, MD; James Arrighi, MD

American Thoracic Society: Henry Fessler, MD

Association of Program Directors in Endocrinology, Diabetes and Metabolism: Ashok Balasubramanyan, MD; Ann Danoff, MD; Geetha Gopalakrishnan, MD

Association of Pulmonary and Critical Care Medicine Program Directors: Craig Piquette, MD; David Schulman, MD

Association of Specialty Professors: John Flaherty, MD; Mark Geraci, MD; Scott Gitlin, MD; Don Rockey, MD; Joshua Safer, MD

Infectious Diseases Society of America: Wendy Armstrong, MD; Daniel Havlichek, Jr, MD

Society of Cardiac Angiography and Interventions: Tarek Helmy, MD; Daniel Kolansky, MD

Society of Critical Care Medicine: Stephen Pastores, MD; Antoinette Spevetz, MD

The Endocrine Society: Beverly Biller, MD; Ailene Cantelmi

The diagram below presents an example set of milestones for one sub-competency in the same format as the ACGME Report Worksheet. For each reporting period, a fellow’s performance on the milestones for each sub-competency will be indicated by:

- selecting the column of milestones that best describes that fellow’s performance
- or,
- selecting the “Critical Deficiencies” response box

1. Gathers and synthesizes essential and accurate information to define each patient’s clinical problem(s). (PC1)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	Does not or is inconsistently able to collect accurate historical data	Consistently acquires accurate and relevant histories	Acquires accurate histories in an efficient, prioritized, and hypothesis-driven fashion	Obtains relevant historical subtleties, including sensitive information that informs the differential diagnosis	Role-models and teaches the effective use of history and physical examination skills to minimize the need for further diagnostic testing
	Does not perform or use an appropriately thorough physical exam, or misses key physical exam findings	Consistently performs accurate and appropriately thorough physical exams	Performs accurate physical exams that are targeted to the patient’s problems	Identifies subtle or unusual physical exam findings	
	Relies exclusively on documentation of others to generate own database or differential diagnosis or is overly reliant on secondary data	Inconsistently recognizes patient’s central clinical problem or develops limited differential diagnoses	Uses and synthesizes collected data to define a patient’s central clinical problem(s) to generate a prioritized differential diagnosis and problem list	Efficiently utilizes all sources of secondary data to inform differential diagnosis	
	Fails to recognize patient’s central clinical problems			Effectively uses history and physical examination skills to minimize the need for further diagnostic testing	
	Fails to recognize potentially life threatening problems				
<div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div>					
Comments:					

Selecting a response box in the middle of a column implies milestones in that column as well as those in previous columns have been substantially demonstrated. The fellow is in transition to the next level of development.

Selecting a response box on the line inbetween columns indicates that milestones in lower levels have been substantially demonstrated as well as **some** milestones in the higher column(s).

1. Gathers and synthesizes essential and accurate information to define each patient's clinical problem(s). (PC1)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Does not or is inconsistently able to collect accurate historical data</p> <p>Does not perform or use an appropriately thorough physical exam, or misses key physical exam findings</p> <p>Relies exclusively on documentation of others to generate own database or differential diagnosis or is overly reliant on secondary data</p> <p>Fails to recognize patient's central clinical problems</p> <p>Fails to recognize potentially life threatening problems</p>	<p>Consistently acquires accurate and relevant histories</p> <p>Consistently performs accurate and appropriately thorough physical exams</p> <p>Inconsistently recognizes patient's central clinical problem or develops limited differential diagnoses</p>	<p>Acquires accurate histories in an efficient, prioritized, and hypothesis-driven fashion</p> <p>Performs accurate physical exams that are targeted to the patient's problems</p> <p>Uses and synthesizes collected data to define a patient's central clinical problem(s) to generate a prioritized differential diagnosis and problem list</p>	<p>Obtains relevant historical subtleties, including sensitive information that informs the differential diagnosis</p> <p>Identifies subtle or unusual physical exam findings</p> <p>Efficiently utilizes all sources of secondary data to inform differential diagnosis</p> <p>Effectively uses history and physical examination skills to minimize the need for further diagnostic testing</p>	<p>Role-models and teaches the effective use of history and physical examination skills to minimize the need for further diagnostic testing</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					



2. Develops and achieves comprehensive management plan for each patient. (PC2)										
Not Yet Assessable	Critical Deficiencies				Ready for unsupervised practice	Aspirational				
	Care plans are consistently inappropriate or inaccurate		Inconsistently develops an appropriate care plan	Consistently develops appropriate care plan	Appropriately modifies care plans based on patient's clinical course, additional data, patient preferences, and cost-effectiveness principles	Role-models and teaches complex and patient-centered care				
	Does not react to situations that require urgent or emergency care		Inconsistently seeks additional guidance when needed	Recognizes situations requiring urgent or emergency care	Recognizes disease presentations that deviate from common patterns and require complex decision-making, incorporating diagnostic uncertainty	Develops customized, prioritized care plans for the most complex patients, incorporating diagnostic uncertainty and cost-effectiveness principles				
	Does not seek additional guidance when needed			Seeks additional guidance and/or consultation as appropriate	Manages complex acute and chronic conditions					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

3. Manages patients with progressive responsibility and independence. (PC3)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Cannot advance beyond the need for direct supervision in the delivery of patient care</p> <p>Cannot manage patients who require urgent or emergency care</p> <p>Does not assume responsibility for patient management decisions</p>	<p>Requires direct supervision to ensure patient safety and quality care</p> <p>Requires direct supervision to manage problems or common chronic diseases in all appropriate clinical settings</p> <p>Inconsistently provides preventive care in all appropriate clinical settings</p> <p>Requires direct supervision to manage patients with straightforward diagnoses in all appropriate clinical settings</p> <p>Unable to manage complex inpatients or patients requiring intensive care</p> <p>Cannot independently supervise care provided by other members of the physician-led team</p>	<p>Requires indirect supervision to ensure patient safety and quality care</p> <p>Provides appropriate preventive care and chronic disease management in all appropriate clinical settings</p> <p>Provides comprehensive care for single or multiple diagnoses in all appropriate clinical settings</p> <p>Under supervision, provides appropriate care in the intensive care unit</p> <p>Initiates management plans for urgent or emergency care</p>	<p>Independently manages patients across applicable inpatient, outpatient, and ambulatory clinical settings who have a broad spectrum of clinical disorders, including undifferentiated syndromes</p> <p>Seeks additional guidance and/or consultation as appropriate</p> <p>Appropriately manages situations requiring urgent or emergency care</p> <p>Effectively supervises the management decisions of the team in all appropriate clinical settings</p>	<p>Effectively manages unusual, rare, or complex disorders in all appropriate clinical settings</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

4a. Demonstrates skill in performing and interpreting invasive procedures. (PC4a)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Attempts to perform invasive procedures without sufficient technical skill or supervision</p> <p>Fails to recognize cases in which invasive procedures are unwarranted or unsafe</p> <p>Does not recognize the need to discuss procedure indications, processes, or potential risks with patients</p> <p>Fails to engage the patient in the informed consent process, and/or does not effectively describe risks and benefits of procedures</p>	<p>Possesses insufficient technical skill for safe completion of common invasive procedures with appropriate supervision</p> <p>Inattentive to patient safety and comfort when performing invasive procedures</p> <p>Applies the ethical principles of informed consent</p> <p>Recognizes the need to obtain informed consent for procedures, but ineffectively obtains it</p> <p>Understands and communicates ethical principles of informed consent</p>	<p>Possesses basic technical skill for the completion and interpretation of some common invasive procedures with appropriate supervision</p> <p>Inconsistently manages patient safety and comfort when performing invasive procedures</p> <p>Inconsistently recognizes appropriate patients, indications, and associated risks in the performance of invasive procedures</p> <p>Obtains and documents informed consent</p>	<p>Consistently demonstrates technical skill to successfully and safely perform and interpret invasive procedures</p> <p>Maximizes patient comfort and safety when performing invasive procedures</p> <p>Consistently recognizes appropriate patients, indications, and associated risks in the performance of invasive procedures</p> <p>Effectively obtains and documents informed consent in challenging circumstances (e.g., language or cultural barriers)</p> <p>Quantifies evidence for risk-benefit analysis during obtainment of informed consent for complex procedures or therapies</p>	<p>Demonstrates skill to independently perform and interpret complex invasive procedures that are anticipated for future practice</p> <p>Demonstrates expertise to teach and supervise others in the performance of invasive procedures</p> <p>Designs consent instrument for a human subject research study; files an Institution Review Board (IRB) application</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Comments:</p> <p><input type="checkbox"/> Not Applicable</p>					

4b. Demonstrates skill in performing and interpreting non-invasive procedures and/or testing. (PC4b)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Does not recognize patients for whom non-invasive procedures and/or testing is not warranted or is unsafe</p> <p>Attempts to perform or interpret non-invasive procedures and/or testing without sufficient skill or supervision</p> <p>Does not recognize the need to discuss procedure indications, processes, or potential risks with patients</p> <p>Fails to engage the patient in the informed consent process and/or does not effectively describe risks and benefits of procedures</p>	<p>Possesses insufficient skill to safely perform and interpret non-invasive procedures and/or testing with appropriate supervision</p> <p>Inattentive to patient safety and comfort when performing non-invasive procedures and/or testing procedures</p> <p>Applies the ethical principles of informed consent</p> <p>Recognizes need to obtain informed consent for procedures but ineffectively obtains it</p> <p>Understands and communicates ethical principles of informed consent</p>	<p>Inconsistently recognizes appropriate patients, indications, and associated risks in the utilization of non-invasive procedures and/or testing</p> <p>Inconsistently integrates procedures and/or testing results with clinical features in the evaluation and management of patients</p> <p>Can safely perform and interpret selected non-invasive procedures and/or testing procedures with minimal supervision</p> <p>Inconsistently recognizes high-risk findings and artifacts/normal variants</p> <p>Obtains and documents informed consent</p>	<p>Consistently recognizes appropriate patients, indications, limitations, and associated risks in utilization of non-invasive procedures and/or testing</p> <p>Integrates procedures and/or testing results with clinical findings in the evaluation and management of patients</p> <p>Recognizes procedures and/or testing results that indicate high-risk state or adverse prognosis</p> <p>Recognizes artifacts and normal variants</p> <p>Consistently performs and interprets non-invasive procedures and/or testing in a safe and effective manner</p> <p>Effectively obtains and documents informed consent in challenging circumstances (e.g., language or cultural barriers)</p>	<p>Demonstrates skill to independently perform and interpret complex non-invasive procedures and/or testing</p> <p>Demonstrates expertise to teach and supervise others in the performance of advanced non-invasive procedures and/or testing</p> <p>Designs consent instrument for a human subject research study; files an Institution Review Board (IRB) application</p>

The Milestones are a product of the Internal Medicine Subspecialty Project, a Joint Initiative of the Accreditation Council for Graduate Medical Education and the American Board of Internal Medicine.



5. Requests and provides consultative care. (PC5)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Is unresponsive to questions or concerns of others when acting as a consultant or utilizing consultant services</p> <p>Unwilling to utilize consultant services when appropriate for patient care</p>	<p>Inconsistently manages patients as a consultant to other physicians/health care teams</p> <p>Inconsistently applies risk assessment principles to patients while acting as a consultant</p> <p>Inconsistently formulates a clinical question for a consultant to address</p>	<p>Provides consultation services for patients with clinical problems requiring basic risk assessment</p> <p>Asks meaningful clinical questions that guide the input of consultants</p>	<p>Provides consultation services for patients with basic and complex clinical problems requiring detailed risk assessment</p> <p>Appropriately integrates recommendations from other consultants in order to effectively manage patient care</p>	<p>Provides consultation services for patients with very complex clinical problems requiring extensive risk assessment</p> <p>Models management of discordant recommendations from multiple consultants</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

**Patient Care**

The fellow is demonstrating satisfactory development of the knowledge, skill, and attitudes/behaviors needed to advance in the training program. He or she is demonstrating a learning trajectory that anticipates the achievement of competency for unsupervised practice that includes the delivery of safe, effective, patient-centered, timely, efficient, and equitable care.

\_\_\_\_\_ Yes    \_\_\_\_\_ No    \_\_\_\_\_ Conditional on Improvement

6. Possesses Clinical knowledge (MK1)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	Lacks the scientific, socioeconomic, or behavioral knowledge required to provide patient care	Possesses insufficient scientific, socioeconomic, and behavioral knowledge required to provide care for common medical conditions and basic preventive care	Possesses the scientific, socioeconomic, and behavioral knowledge required to provide care for common medical conditions and basic preventive care	Possesses the scientific, socioeconomic, and behavioral knowledge required to provide care for complex medical conditions and comprehensive preventive care	Possesses the scientific, socioeconomic, and behavioral knowledge required to successfully diagnose and treat medically uncommon, ambiguous, and complex conditions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

7. Knowledge of diagnostic testing and procedures. (MK2)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	Lacks foundational knowledge to apply diagnostic testing and procedures to patient care	<p>Inconsistently interprets basic diagnostic tests accurately</p> <p>Does not understand the concepts of pre-test probability and test performance characteristics</p> <p>Minimally understands the rationale and risks associated with common procedures</p>	<p>Consistently interprets basic diagnostic tests accurately</p> <p>Needs assistance to understand the concepts of pre-test probability and test performance characteristics</p> <p>Fully understands the rationale and risks associated with common procedures</p>	<p>Interprets complex diagnostic tests accurately while accounting for limitations and biases</p> <p>Knows the indications for, and limitations of, diagnostic testing and procedures</p> <p>Understands the concepts of pre-test probability and test performance characteristics</p> <p>Teaches the rationale and risks associated with common procedures and anticipates potential complications of procedures</p>	<p>Anticipates and accounts for subtle nuances of interpreting diagnostic tests and procedures</p> <p>Pursues knowledge of new and emerging diagnostic tests and procedures</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					



8. Scholarship. (MK3)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p><b>Foundation</b> Unaware of or uninterested in scientific inquiry or scholarly productivity</p> <p><b>Investigation</b> Unwilling to perform scholarly investigation in the specialty</p> <p><b>Analysis</b> Fails to engage in critical thinking regarding clinical practice, quality improvement, patient safety, education, or research</p> <p><b>Dissemination</b> Unable or unwilling to effectively communicate and/or disseminate knowledge</p>	<p>Interested in scholarly activity, but does not initiate or follow through</p> <p>Performs a literature search using relevant scholarly sources to identify pertinent articles</p> <p>Aware of basic statistical concepts, but has incomplete understanding of their application; inconsistently identifies methodological flaws</p> <p>Communicates rudimentary details of scientific work, including his or her own scholarly work; needs to improve</p>	<p>Identifies areas worthy of scholarly investigation and formulates a plan under supervision of a mentor</p> <p>Critically reads scientific literature and identifies major methodological flaws and inconsistencies within or between publications</p> <p>Understands and is able to apply basic statistical concepts, and can identify potential analytic methods for data or problem assessment</p> <p>Effectively presents at journal club, quality improvement meetings, clinical conferences, and/or is able to</p>	<p>Formulates ideas worthy of scholarly investigation</p> <p>Collaborates with other investigators to design and complete a project related to clinical practice, quality improvement, patient safety, education, or research</p> <p>Critiques specialized scientific literature effectively</p> <p>Dissects a problem into its many component parts and identifies strategies for solving</p> <p>Uses analytical methods of the field effectively</p> <p>Presents scholarly activity at local or regional meetings, and/or submits an abstract summarizing scholarly work to</p>	<p>Independently formulates novel and important ideas worthy of scholarly investigation</p> <p>Leads a scholarly project advancing clinical practice, quality improvement, patient safety, education, or research</p> <p>Obtains independent research funding</p> <p>Critiques specialized scientific literature at a level consistent with participation in peer review</p> <p>Employs optimal statistical techniques</p> <p>Teaches analytic methods in chosen field to peers and others</p> <p>Effectively presents scholarly work at national and international meetings</p>

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			ability to present in small groups	effectively describe and discuss his or her own scholarly work or research	regional/state/ national meetings, and/or publishes non-peer-reviewed manuscript(s) (reviews, book chapters)	Publishes peer-reviewed manuscript(s) containing scholarly work (clinical practice, quality improvement, patient safety, education, or research)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:						

**Medical Knowledge**

The fellow is demonstrating satisfactory development of the knowledge, skill, and attitudes/behaviors needed to advance in the training program. He or she is demonstrating a learning trajectory that anticipates the achievement of competency for unsupervised practice that includes the delivery of safe, effective, patient-centered, timely, efficient, and equitable care.

\_\_\_\_\_ Yes    \_\_\_\_\_ No    \_\_\_\_\_ Conditional on Improvement

9. Works effectively within an interprofessional team (e.g., with peers, consultants, nursing, ancillary professionals, and other support personnel). (SBP1)										
Not Yet Assessable	Critical Deficiencies						Ready for unsupervised practice			Aspirational
	Refuses to recognize the contributions of other interprofessional team members		Identifies roles of other team members, but does not recognize how/when to utilize them as resources		Understands the roles and responsibilities of all team members, but uses them ineffectively		Understands the roles and responsibilities of, and effectively partners with, all members of the team			Develops, trains, and inspires the team regarding unexpected events or new patient management strategies
	Frustrates team members with inefficiency and errors		Participates in team discussions when required, but does not actively seek input from other team members		Actively engages in team meetings and collaborative decision-making		Efficiently coordinates activities of other team members to optimize care			Viewed by other team members as a leader in the delivery of high-quality care
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

10. Recognizes system error and advocates for system improvement. (SBP2)										
Not Yet Assessable	Critical Deficiencies				Ready for unsupervised practice	Aspirational				
	<p> Ignores a risk for error within the system that may affect the care of a patient</p> <p> Ignores feedback and is unwilling to change behavior in order to reduce the risk for error</p>		<p> Does not recognize the potential for system error</p> <p> Makes decisions that could lead to errors that are otherwise corrected by the system or supervision</p> <p> Resistant to feedback about decisions that may lead to error or otherwise cause harm</p>	<p> Recognizes the potential for error within the system</p> <p> Identifies obvious or critical causes of error and notifies supervisor accordingly</p> <p> Recognizes the potential risk for error in the immediate system and takes necessary steps to mitigate that risk</p> <p> Willing to receive feedback about decisions that may lead to error or otherwise cause harm</p>	<p> Identifies systemic causes of medical error and navigates them to provide safe patient care</p> <p> Advocates for safe patient care and optimal patient care systems</p> <p> Activates formal system resources to investigate and mitigate real or potential medical error</p> <p> Reflects upon and learns from own critical incidents that may lead to medical error</p>	<p> Advocates for system leadership to formally engage in quality assurance and quality improvement activities</p> <p> Viewed as a leader in identifying and advocating for the prevention of medical error</p> <p> Teaches others regarding the importance of recognizing and mitigating system error</p>				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

11. Identifies forces that impact the cost of health care, and advocates for and practices cost-effective care. (SBP3)										
Not Yet Assessable	Critical Deficiencies						Ready for unsupervised practice			Aspirational
	<p>Ignores cost issues in the provision of care</p> <p>Demonstrates no effort to overcome barriers to cost-effective care</p>		<p>Lacks awareness of external factors (e.g., socio-economic, cultural, literacy, insurance status) that impact the cost of health care, and the role that external stakeholders (e.g., providers, suppliers, financiers, purchasers) have on the cost of care</p> <p>Does not consider limited health care resources when ordering diagnostic or therapeutic interventions</p>	<p>Recognizes that external factors influence a patient's utilization of health care and may act as barriers to cost-effective care</p> <p>Minimizes unnecessary diagnostic and therapeutic tests</p> <p>Possesses an incomplete understanding of cost-awareness principles for a population of patients (e.g., use of screening tests)</p>			<p>Consistently works to address patient-specific barriers to cost-effective care</p> <p>Advocates for cost-conscious utilization of resources such as emergency department visits and hospital readmissions</p> <p>Incorporates cost-awareness principles into standard clinical judgments and decision-making, including use of screening tests</p>			<p>Teaches patients and health care team members to recognize and address common barriers to cost-effective care and appropriate utilization of resources</p> <p>Actively participates in initiatives and care delivery models designed to overcome or mitigate barriers to cost-effective, high-quality care</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

12. Transitions patients effectively within and across health delivery systems. (SBP4)										
Not Yet Assessable	Critical Deficiencies					Ready for unsupervised practice		Aspirational		
	Disregards need for communication at time of transition		Inconsistently utilizes available resources to coordinate and ensure safe and effective patient care within and across delivery systems	Recognizes the importance of communication during times of transition		Appropriately utilizes available resources to coordinate care and manage conflicts to ensure safe and effective patient care within and across delivery systems		Coordinates care within and across health delivery systems to optimize patient safety, increase efficiency, and ensure high-quality patient outcomes		
	Does not respond to requests of caregivers in other delivery systems		Provides incomplete written and verbal care plans during times of transition	Communicates with future caregivers, but demonstrates lapses in provision of pertinent or timely information		Actively communicates with past and future caregivers to ensure continuity of care		Role-models and teaches effective transitions of care		
	Written and verbal care plans during times of transition are absent		Provides inefficient transitions of care that lead to unnecessary expense or risk to a patient (e.g., duplication of tests, readmission)			Anticipates needs of patient, caregivers, and future care providers and takes appropriate steps to address those needs				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

**Systems-based Practice**

The fellow is demonstrating satisfactory development of the knowledge, skill, and attitudes/behaviors needed to advance in the training program. He or she is demonstrating a learning trajectory that anticipates the achievement of competency for unsupervised practice that includes the delivery of safe, effective, patient-centered, timely, efficient, and equitable care.

\_\_\_\_\_ Yes    \_\_\_\_\_ No    \_\_\_\_\_ Conditional on Improvement

13. Monitors practice with a goal for improvement. (PBL1)										
Not Yet Assessable	Critical Deficiencies				Ready for unsupervised practice		Aspirational			
	Unwilling to self-reflect upon one's practice or performance		Unable to self-reflect upon practice or performance		Inconsistently self-reflects upon practice or performance, and inconsistently acts upon those reflections		Regularly self-reflects upon one's practice or performance, and consistently acts upon those reflections to improve practice		Regularly seeks external validation regarding self-reflection to maximize practice improvement	
	Not concerned with opportunities for learning and self-improvement		Misses opportunities for learning and self-improvement		Inconsistently acts upon opportunities for learning and self-improvement		Recognizes sub-optimal practice or performance as an opportunity for learning and self-improvement		Actively and independently engages in self-improvement efforts and reflects upon the experience	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

14. Learns and improves via performance audit. (PBLI2)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Disregards own clinical performance data</p> <p>Demonstrates no inclination to participate in or even consider the results of quality-improvement efforts</p> <p>Not familiar with the principles, techniques, or importance of quality improvement</p>	<p>Limited ability to analyze own clinical performance data</p> <p>Nominally engaged in opportunities to achieve focused education and performance improvement</p>	<p>Analyzes own clinical performance gaps and identifies opportunities for improvement</p> <p>Participates in opportunities to achieve focused education and performance improvement</p> <p>Understands common principles and techniques of quality improvement and appreciates the responsibility to assess and improve care for a panel of patients</p>	<p>Analyzes own clinical performance data and actively works to improve performance</p> <p>Actively engages in opportunities to achieve focused education and performance improvement</p> <p>Demonstrates the ability to apply common principles and techniques of quality improvement to improve care for a panel of patients</p>	<p>Actively monitors clinical performance through various data sources</p> <p>Able to lead projects aimed at education and performance improvement</p> <p>Utilizes common principles and techniques of quality improvement to continuously improve care for a panel of patients</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					



15. Learns and improves via feedback. (PBL13)									
Not Yet Assessable	Critical Deficiencies					Ready for unsupervised practice	Aspirational		
	Never solicits feedback	Rarely seeks and does not incorporate feedback	Solicits feedback only from supervisors and inconsistently incorporates feedback	Solicits feedback from all members of the interprofessional team and patients	Performance continuously reflects incorporation of solicited and unsolicited feedback				
	Actively resists feedback from others	Responds to unsolicited feedback in a defensive fashion	Is open to unsolicited feedback	Welcomes unsolicited feedback	Role-models ability to reconcile disparate or conflicting feedback				
		Temporarily or superficially adjusts performance based on feedback	Inconsistently incorporates feedback	Consistently incorporates feedback					
				Able to reconcile disparate or conflicting feedback					
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:									

16. Learns and improves at the point of care. (PBLI4)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Fails to acknowledge uncertainty and reverts to a reflexive patterned response even when inaccurate</p> <p>Fails to seek or apply evidence when necessary</p>	<p>Rarely reconsiders an approach to a problem, asks for help, or seeks new information</p> <p>Can translate medical information needs into well-formed clinical questions with assistance</p> <p>Unfamiliar with strengths and weaknesses of the medical literature</p> <p>Has limited awareness of, or ability to use, information technology or decision support tools and guidelines</p> <p>Accepts the findings of clinical research studies without critical appraisal</p>	<p>Inconsistently reconsiders an approach to a problem, asks for help, or seeks new information</p> <p>Can translate medical information needs into well-formed clinical questions independently</p> <p>Aware of the strengths and weaknesses of medical information resources, but utilizes information technology without sophistication</p> <p>With assistance, appraises clinical research reports based on accepted criteria</p>	<p>Routinely reconsiders an approach to a problem, asks for help, or seeks new information</p> <p>Routinely translates new medical information needs into well-formed clinical questions</p> <p>Guided by the characteristics of clinical questions, efficiently searches medical information resources, including decision support tools and guidelines</p> <p>Independently appraises clinical research reports based on accepted criteria</p>	<p>Role-models how to appraise clinical research reports based on accepted criteria</p> <p>Has a systematic approach to track and pursue emerging clinical questions</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

**Practice-Based Learning and Improvement**

The fellow is demonstrating satisfactory development of the knowledge, skill, and attitudes/behaviors needed to advance in the training program. He or she is demonstrating a learning trajectory that anticipates the achievement of competency for unsupervised practice that includes the delivery of safe, effective, patient-centered, timely, efficient, and equitable care.

\_\_\_\_\_ Yes    \_\_\_\_\_ No    \_\_\_\_\_ Conditional on Improvement

17. Has professional and respectful interactions with patients, caregivers, and members of the interprofessional team (e.g., peers, consultants, nursing, ancillary professionals, and support personnel). (PROF1)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Disrespectful in interactions with patients, caregivers, and members of the interprofessional team</p> <p>Sacrifices patient needs in favor of self-interest</p> <p>Does not demonstrate empathy, compassion, and respect for patients and caregivers</p> <p>Does not demonstrate responsiveness to patients' and caregivers' needs in an appropriate fashion</p> <p>Does not consider patient privacy and autonomy</p> <p>Unaware of physician and colleague self-care and wellness</p>	<p>Inconsistently demonstrates empathy, compassion, and respect for patients and caregivers</p> <p>Inconsistently demonstrates responsiveness to patients' and caregivers' needs in an appropriate fashion</p> <p>Inconsistently considers patient privacy and autonomy</p> <p>Inconsistently aware of physician and colleague self-care and wellness</p>	<p>Consistently respectful in interactions with patients, caregivers, and members of the interprofessional team, even in challenging situations</p> <p>Is available and responsive to needs and concerns of patients, caregivers, and members of the interprofessional team to ensure safe and effective patient care</p> <p>Emphasizes patient privacy and autonomy in all interactions</p> <p>Consistently aware of physician and colleague self-care and wellness</p>	<p>Demonstrates empathy, compassion, and respect to patients and caregivers in all situations</p> <p>Anticipates, advocates for, and actively works to meet the needs of patients and caregivers</p> <p>Demonstrates a responsiveness to patient needs that supersedes self-interest</p> <p>Positively acknowledges input of members of the interprofessional team and incorporates that input into plan of care, as appropriate</p> <p>Regularly reflects on, assesses, and recommends physician and colleague self-care and wellness</p>	<p>Role-models compassion, empathy, and respect for patients and caregivers</p> <p>Role-models appropriate anticipation and advocacy for patient and caregiver needs</p> <p>Fosters collegiality that promotes a high-functioning interprofessional team</p> <p>Teaches others regarding maintaining patient privacy and respecting patient autonomy</p> <p>Role-models personal self-care practice for others and promotes programs for colleague wellness</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

18. Accepts responsibility and follows through on tasks. (PROF2)										
Not Yet Assessable	Critical Deficiencies					Ready for unsupervised practice			Aspirational	
	Is consistently unreliable in completing patient care responsibilities or assigned administrative tasks  Shuns responsibilities expected of a physician professional			Completes most assigned tasks in a timely manner but may need reminders or other support  Accepts professional responsibility only when assigned or mandatory	Completes administrative and patient care tasks in a timely manner in accordance with local practice and/or policy  Completes assigned professional responsibilities without questioning or the need for reminders	Prioritizes multiple competing demands in order to complete tasks and responsibilities in a timely and effective manner  Willingly assumes professional responsibility regardless of the situation			Role-models prioritizing many competing demands in order to complete tasks and responsibilities in a timely and effective manner  Assists others to improve their ability to prioritize many competing tasks	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

19. Responds to each patient's unique characteristics and needs. (PROF3)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	<p>Is insensitive to differences related to personal characteristics and needs in the patient/caregiver encounter</p> <p>Is unwilling to modify care plan to account for a patient's unique characteristics and needs</p>	<p>Is sensitive to and has basic awareness of differences related to personal characteristics and needs in the patient/caregiver encounter</p> <p>Requires assistance to modify care plan to account for a patient's unique characteristics and needs</p>	<p>Seeks to fully understand each patient's personal characteristics and needs</p> <p>Modifies care plan to account for a patient's unique characteristics and needs with partial success</p>	<p>Recognizes and accounts for the personal characteristics and needs of each patient</p> <p>Appropriately modifies care plan to account for a patient's unique characteristics and needs</p>	<p>Role-models professional interactions to navigate and negotiate differences related to a patient's unique characteristics or needs</p> <p>Role-models consistent respect for patient's unique characteristics and needs</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

20. Exhibits integrity and ethical behavior in professional conduct. (PROF4)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	Dishonest in clinical interactions, documentation, research, or scholarly activity	Honest in clinical interactions, documentation, research, and scholarly activity	Honest and forthright in clinical interactions, documentation, research, and scholarly activity	Demonstrates integrity, honesty, and accountability to patients, society, and the profession	Assists others in adhering to ethical principles and behaviors, including integrity, honesty, and professional responsibility
	Refuses to be accountable for personal actions	Requires oversight for professional actions related to the subspecialty	Demonstrates accountability for the care of patients	Actively manages challenging ethical dilemmas and conflicts of interest	Role-models integrity, honesty, accountability, and professional conduct in all aspects of professional life
	Does not adhere to basic ethical principles	Has a basic understanding of ethical principles, formal policies, and procedures and does not intentionally disregard them	Adheres to ethical principles for documentation, follows formal policies and procedures, acknowledges and limits conflict of interest, and upholds ethical expectations of research and scholarly activity	Identifies and responds appropriately to lapses of professional conduct among peer group	Identifies and responds appropriately to lapses of professional conduct within the system in which he or she works
	Blatantly disregards formal policies or procedures	Recognizes potential conflicts of interest	Consistently attempts to recognize and manage conflicts of interest	Regularly reflects on personal professional conduct	
	Fails to recognize conflicts of interest			Identifies and manages conflicts of interest	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

**Professionalism**

The fellow is demonstrating satisfactory development of the knowledge, skill, and attitudes/behaviors needed to advance in the training program. He or she is demonstrating a learning trajectory that anticipates the achievement of competency for unsupervised practice that includes the delivery of safe, effective, patient-centered, timely, efficient, and equitable care.

\_\_\_\_\_ Yes    \_\_\_\_\_ No    \_\_\_\_\_ Conditional on Improvement

21. Communicates effectively with patients and caregivers. (ICS1)										
Not Yet Assessable	Critical Deficiencies				Ready for unsupervised practice	Aspirational				
	<p>Ignores patient preferences for plan of care</p> <p>Makes no attempt to engage patient in shared decision-making</p> <p>Routinely engages in antagonistic or counter-therapeutic relationships with patients and caregivers</p>	<p>Engages patients in discussions of care plans and respects patient preferences when offered by the patient, but does not actively solicit preferences</p> <p>Attempts to develop therapeutic relationships with patients and caregivers but is inconsistently successful</p> <p>Defers difficult or ambiguous conversations to others</p>	<p>Engages patients in shared decision-making in uncomplicated conversations</p> <p>Requires assistance facilitating discussions in difficult or ambiguous conversations</p> <p>Requires guidance or assistance to engage in communication with persons of different socioeconomic and cultural backgrounds</p>	<p>Identifies and incorporates patient preference in shared decision-making in complex patient care conversations and the plan of care</p> <p>Quickly establishes a therapeutic relationship with patients and caregivers, including persons of different socioeconomic and cultural backgrounds</p>	<p>Role-models effective communication and development of therapeutic relationships in both routine and challenging situations</p> <p>Models cross-cultural communication and establishes therapeutic relationships with persons of diverse socioeconomic and cultural backgrounds</p> <p>Assists others with effective communication and development of therapeutic relationships</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:										

22. Communicates effectively in interprofessional teams (e.g., with peers, consultants, nursing, ancillary professionals, and other support personnel). (ICS2)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	Utilizes communication strategies that hamper collaboration and teamwork  Verbal and/or non-verbal behaviors disrupt effective collaboration with team members	Uses unidirectional communication that fails to utilize the wisdom of team members  Resists offers of collaborative input	Inconsistently engages in collaborative communication with appropriate members of the team  Inconsistently employs verbal, non-verbal, and written communication strategies that facilitate collaborative care	Consistently and actively engages in collaborative communication with all members of the team  Verbal, non-verbal, and written communication consistently acts to facilitate collaboration with team members to enhance patient care	Role models and teaches collaborative communication with the team to enhance patient care, even in challenging settings and with conflicting team member opinions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					



23. Appropriate utilization and completion of health records. (ICS3)					
Not Yet Assessable	Critical Deficiencies			Ready for unsupervised practice	Aspirational
	Provides health records that are missing significant portions of important clinical data  Does not enter medical information and test results/interpretations into health record	Health records are disorganized and inaccurate  Inconsistently enters medical information and test results/interpretations into health record	Health records are organized and accurate, but are superficial and miss key data or fail to communicate clinical reasoning  Consistently enters medical information and test results/interpretations into health records	Patient-specific health records are organized, timely, accurate, comprehensive, and effectively communicate clinical reasoning  Provides effective and prompt medical information and test results/interpretations to physicians and patients	Role-models and teaches importance of organized, accurate, and comprehensive health records that are succinct and patient-specific
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					

**Interpersonal and Communications Skills**

The fellow is demonstrating satisfactory development of the knowledge, skill, and attitudes/behaviors needed to advance in the training program. He or she is demonstrating a learning trajectory that anticipates the achievement of competency for unsupervised practice that includes the delivery of safe, effective, patient-centered, timely, efficient, and equitable care.

\_\_\_\_\_ Yes    \_\_\_\_\_ No    \_\_\_\_\_ Conditional on Improvement

**Overall Clinical Competence**

This rating represents the assessment of the fellow's development of overall clinical competence during this year of training:

- \_\_\_ Superior: Far exceeds the expected level of development for this year of training
- \_\_\_ Satisfactory: Always meets and occasionally exceeds the expected level of development for this year of training
- \_\_\_ Conditional on Improvement: Meets some developmental milestones but occasionally falls short of the expected level of development for this year of training. An improvement plan is in place to facilitate achievement of competence appropriate to the level of training.
- \_\_\_ Unsatisfactory: Consistently falls short of the expected level of development for this year of training.



## Adult Rheumatology Entrustable Professional Activities (EPA)

Approved by the American College of Rheumatology

1. Manage the care of patients with acute and chronic, common and complex rheumatologic diseases across multiple care settings.  
*MK, PC, ICS, P, PBLI, SBP*
2. Demonstrate expertise in the performance and interpretation of the musculoskeletal examination.  
*MK, PC, ICS, P*
3. Demonstrate expertise in the indications for and interpretation of diagnostic tests and imaging studies relevant to the evaluation of patients with suspected or established rheumatic and musculoskeletal disease.  
*MK, PC, ICS, P*
4. Prescribe and manage immunomodulatory therapy.  
*MK, PC, ICS, P, PBLI, SBP*
5. Perform procedures including arthrocentesis and injections, compensated polarized microscopy, and interpretation of synovial fluid analysis.  
*MK, PC, ICS, P, PBLI*
6. Provide rheumatology consultation to other specialties and providers.  
*MK, PC, ICS, P, PBLI, SBP*
7. Demonstrate professional, compassionate and ethical behavior.  
*ICS, P*
8. Effectively communicate and manage transitions of care with other healthcare providers.  
*MK, PC, ICS, P*

9. Collaborate and work effectively as a member or leader of interprofessional health care teams.

*MK, PC, ICS, P, PBLI, SBP*

10. Facilitate the learning of patients, families, and members of the interprofessional team.

*MK, PC, ICS, P*

11. Enhance and promote patient safety and the quality of health care at both the individual and systems level.

*MK, PC, ICS, P, PBLI, SBP*

12. Advocate for individual patients.

*MK, PC, ICS, P, SBP*

13. Contribute to the fiscally sound and ethical management of a practice.

*PC, ICS, P, SBP*

14. Engage in lifelong learning.

*MK, PBLI, SBP*



PC1-06	Recognize the need to	Without faculty member prompting,		collaboratively review imaging and tissue specimens with radiology and pathology services, respectively, to enhance patient safety and care
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 2. Develops and achieves comprehensive management plan for each patient. (PC2)

Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PC2-01	List the components of	For uncomplicated presentations construct and implement	For complicated presentations construct and implement	Teach others to formulate	a comprehensive treatment plan, based on clinical evidence, clinical context, and patient preferences, counsel patients, and assess response to therapy.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC2-02	Describe state and federal regulations for prescription of controlled substances as part of	Describe non-pharmacologic and pharmacologic components of; Implement, and monitor response to therapy, patient compliance, and detect signs and symptoms indicative of analgesic abuse as part of			a pain management strategy of the care plan.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC2-03	Describes indications and potential adverse events of	Obtains verbal or written informed consent for treatment with	Prescribe, monitor and assess response to	Teaches others to prescribe, monitor and assess response to	pharmacotherapy, including immunomodulatory agents, used in the management of patients with rheumatic diseases.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC2-04	In comparison to adults, discuss the similarities and differences in drug disposition and its consequences regarding; List the currently used		Prescribe and adjust accordingly		pharmacotherapies for use in children and adolescents with rheumatic diseases.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC2-05	Discuss how the changes in pharmacokinetics that occur with age affect		Prescribe and adjust appropriately	Teach others about	therapeutic and management strategies in the aging population with
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

					rheumatic diseases.	
PC2-06	List options for	Describe applications and indications for	Incorporate	Teach others to incorporate	exercise and other rehabilitation strategies in the care of patients with rheumatic disorders.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
PC2-07	With attending supervision	With attending supervision for complicated presentations	Independently; Teach others to			formulate and implement a management plan for patients with rheumatic emergencies (including organ or life threatening conditions), with a need for emergent, urgent or changes in level or goals of care.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### 3. Manages patients with progressive responsibility and independence. (PC3)

Rheumatology Curricular Milestones						
Number	By the listed time the fellow should be able to				For this curricular milestone	
	6 months	12 months	18 months	24 months		
PC3-01	Describe the potential manifestations of	Formulate plans to screen for and manage	Implement and monitor plans for	Teach others to recognize and manage	disease-related exacerbations and the influence of comorbid illness during the provision of longitudinal and customized care to patients with rheumatic diseases.	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
PC3-02	Identify	Formulate plans to screen, assess severity, and manage	Implement and monitor plans to screen, assess severity, and manage	Teach others to recognize and manage	disease- and treatment-related complications that may lead to long term morbidity, including the consideration for implications of comorbid diseases and the effects of aging.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
PC3-03	Recognize	Develop strategies to manage		Implement strategies to manage	the psychosocial aspects of rheumatic diseases.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
PC3-04	List and describe the utility of	Incorporate into practice	Teach others to incorporate into practice			the varied validated instruments in the assessment of pain, disease
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

		activity, function, and quality of life over time to monitor and adjust therapy.
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**4a. Demonstrates skill in performing and interpreting invasive procedures. (PC4a) NOTE: PC4a and PC4b (non-invasive procedures) converted to single template of Skill in performing procedures**

Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PC4-01	With attending supervision	Independently; Teach others to			obtain verbal or written informed consent from patient or caregiver for procedures.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC4-02	With attending supervision	With attending assistance for those that are complicated or previously unperformed		Independently; Teach others to	perform procedures including arthrocentesis and joint and soft tissue injections.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC4-03	With attending supervision; With attending assistance for those that are complicated or previously unperformed; Independently; Teach others to				perform procedures including arthrocentesis and joint and soft tissue injections with ultrasound guidance, when appropriate and feasible.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC4-04	With attending supervision	Independently	Teach others to		perform compensated polarized microscopy to examine and interpret synovial fluid.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**5. Requests and provides consultative care. (PC5)**

Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PC5-01	Identify the indications to	Proactively	Teach others why, when, and how to		refer to other healthcare providers for the co-management of patients with rheumatic disease.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PC5-02	Recognize the tissues commonly considered for	List the indications, expected risks and benefits, and available alternatives for	Implement plans to refer for; Teach others how to incorporate		diagnostic biopsies (including, but not limited to, temporal artery, renal, lung,
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	muscle, nerve, skin, minor salivary gland, and brain) in the evaluation of rheumatic diseases, and refers when indicated and appropriate.
PC5-03	Identify opportunities for referral	Refer when indicated
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
PC5-04	With attending supervision	Independently
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
		provide consultation when requested, in support of the primary care relationship, for patients with rheumatic symptoms and signs and appropriately integrate recommendations from other healthcare providers into the evaluation and management plan.

6. Possesses Clinical knowledge (MK1)					
Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
MK1-01	Demonstrate basic		Demonstrate comprehensive		knowledge of the relevant structure and function of the musculoskeletal system, immune system and basic science for describing the pathophysiology of rheumatologic conditions.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK1-02	Acknowledge the indications for	Independently distinguish indications for	Independently formulate specific consultative questions for		referrals to other subspecialists and ancillary services including orthopedics and rehabilitation medicine.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

MK1-03	List	Explain	Differentiate subtle differences in		relevant mechanisms of action and potential adverse effects of agents used in the management of patients with rheumatologic conditions.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK1-04	Report on	List			the anatomy, physiology and management of pain in patients with rheumatologic conditions.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK1-05	List	Describe in detail	Explain the significance of		similarities and differences of the clinical presentation and management between adults and children with rheumatic conditions.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK1-06	In uncomplicated cases, construct	In cases demonstrating increasing complexity, construct	In highly complex cases, with multi-system involvement, construct	Teach others to construct	a differential diagnosis for rheumatologic conditions, including consideration of non-rheumatic diseases.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK1-07	Demonstrate basic	Demonstrate comprehensive			knowledge regarding the need for preventive care in patients with rheumatic conditions.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK1-08	Demonstrate basic	Demonstrate comprehensive			knowledge to evaluate complex rheumatic diseases in the setting of multiple coexistent conditions, including the effects of aging.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK1-09	Demonstrate basic	Demonstrate comprehensive			knowledge of socio-behavioral sciences including but not limited to health care economics and medical ethics.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 7. Knowledge of diagnostic testing and procedures. (MK2)

### Rheumatology Curricular Milestones

Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	



## 8. Scholarship. (MK3)

### Rheumatology Curricular Milestones

Number	By the listed time the fellow should be able to								For this curricular milestone
	6 months		12 months		18 months		24 months		
MK3-01	Demonstrate basic		Demonstrate comprehensive						knowledge of principles underlying critical appraisal of the medical literature.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MK3-02	List	Describe		Explain the significance of; Implement and interpret				basic biostatistical testing and epidemiological principles.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
MK3-03	Describe principles underlying research study design for			Generate a hypothesis and select methodology for		Perform data collection and analysis for; Disseminate findings of; Recognize components of grant writing and submission for		a scholarly project related to clinical practice, quality improvement, patient safety, medical education or research in collaboration with a faculty mentor.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
MK3-04	Prepare and submit an abstract					Prepare and submit a peer-reviewed manuscript; Prepare and submit a non-peer reviewed manuscript for publication (e.g. clinical review, book chapter)		to demonstrate effective scientific writing skills.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
MK3-05	Effectively present orally at conferences, including but not limited to rheumatology grand rounds, lay education, local and national meetings			Present an abstract locally, regionally, or nationally				to disseminate scholarly work.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
MK3-06	List	Describe; Explain the significance of; Enact						principles of informed consent as it pertains to investigation, involving human subjects.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

## 9. Works effectively within an interprofessional team (e.g., with peers, consultants, nursing, ancillary professionals, and other support personnel). (SBP1)

**Rheumatology Curricular Milestones**

Number	By the listed time the fellow should be able to				For this curricular milestone	
	6 months	12 months	18 months	24 months		
SBP1-01	Acknowledge the contributions from	Actively participate and work with			health care providers from varied disciplines to promote patient-centered care.	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SBP1-02	Recognize the varied	Explain the contributions of	Participate in the activities of		health care providers who work to promote patient safety and to identify risks for and strategies to prevent medical errors.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
SBP1-03	List the individual components that contribute to	Ascribe levels of complexity to the components that comprise	Implement		appropriate coding based on documentation and reimbursement policies.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
SBP1-04	Describes	Differentiates among		Works effectively within	the spectrum of practice models for health care delivery, including the fundamentals of office and personnel management.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

**10. Recognizes system error and advocates for system improvement. (SBP2)**

**Rheumatology Curricular Milestones**

Number	By the listed time the fellow should be able to				For this curricular milestone	
	6 months	12 months	18 months	24 months		
SBP2-01	Recognize situations leading to inefficiencies, safety concerns and/or preventable medical errors when	Participate in a system level quality improvement initiatives while	Design and implement a system level quality improvement initiative while		partnering with other healthcare teams and professionals to improve the quality of care and patient safety within the system.	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
SBP2-02	Demonstrate ability to		Assist others within one's own system to; Assist the public to		recognize opportunities to address causes of disparity in disease and healthcare delivery.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

**11. Identifies forces that impact the cost of health care, and advocates for and practices cost-effective care. (SBP3)**

**Rheumatology Curricular Milestones**

Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
SBP3-01	Recognize the necessity to integrate	Participate in decisions that reflect		Independently incorporate considerations of	cost awareness and cost benefit analysis for disease specific care as well as in individual patients.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SBP3-02	Recognize	Identify ways to address; Advocate for change of		Implement measures to correct	barriers impacting patient care, including socio-economic factors, healthcare literacy, medical disability and health care insurance coverage.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SBP3-03	Identify	Describe the impact on health care cost and access by		Leverage the advantages, for individual patients, of	the various health care settings (academic /public/private/VA) and stakeholders in the healthcare economy.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 12. Transitions patients effectively within and across health delivery systems. (SBP4)

### Rheumatology Curricular Milestones

Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
SBP4-01	Identify the providers, therapies, and potential obstacles to successfully	Discuss strategies to overcome the obstacles to successfully		Implement strategies to successfully	coordinate care across multiple delivery systems, including ambulatory, subacute, acute, rehabilitation and skilled nursing facilities.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 13. Monitors practice with a goal for improvement. (PBL11)

### Rheumatology Curricular Milestones

Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PBL11-01	Acknowledge the importance of reflection to	Routinely reflect on clinical interactions to; Describe his or her own efforts to	Seek resources to address		identify(ied) knowledge or skills gaps to enhance future clinical interactions.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

PBL11-02	Recognize						Implement			ways to improve his/her role in the effective management of a practice.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**14. Learns and improves via performance audit. (PBLI2)**

Rheumatology Curricular Milestones						
Number	By the listed time the fellow should be able to				For this curricular milestone	
	6 months	12 months	18 months	24 months		
PBLI2-01	Can describe what s/he	Independently identify and describe what s/he		Demonstrate through actions taken to improve the system or processes of care that s/he	learns from errors.	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PBLI2-02	Identify an area of inquiry to direct			Design the method for; Perform and analyze; Reflect on and hypothesize an explanation for deficiencies found (including doctor-related, system-related, and patient-related factors) through; Change practice based on results of	an audit of a panel of patients using standardized, disease-specific, and evidence-based criteria.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**15. Learns and improves via feedback. (PBLI3)**

Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PBLI3-01	Accept and reflect on; Actively seek and reflect on; Develop plans for practice improvement based on				feedback from all members of the health care team including faculty, peers, students, nurses, allied health workers, patients and their advocates.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**16. Learns and improves at the point of care. (PBLI4)**

**Rheumatology Curricular Milestones**

Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PBLI4-01	Identify basic knowledge gaps and seek	In all cases, independently construct and pursue			answers to clinical questions, and performs self-reflection to incorporate learning for future clinical encounters.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PBLI4-02	Independently	Teach others to			use(s) technology to manage information (HIPAA compliant), support patient care decisions using evidence-based medicine and enhance both patient and physician education.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PBLI4-03	With prompting from faculty	Independently			maintains awareness of the situation in the moment, and responds to meet situational needs.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PBLI4-04	Customizes management based on; Determines applicability of				clinical evidence for individualized patient care.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**17. Has professional and respectful interactions with patients, caregivers, and members of the interprofessional team (e.g., peers, consultants, nursing, ancillary professionals, and support personnel). (PROF1)**

**Rheumatology Curricular Milestones**

Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PROF1-01	Recognize and manage differences of opinion with patients to; Recognize and manage differences of opinion with other members of the interprofessional team to; Provide constructive feedback to other members of the health care team to				demonstrate respectful professional interactions.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PROF1-02	Provide responsible team leadership to				demonstrate respect for patient dignity and autonomy.
	<input type="checkbox"/>	<input type="checkbox"/>			



PROF1-03	Recognize, respond to, and report impairment in colleagues or substandard care via peer review process		as a demonstration of commitment to providing safe patient care.
	<input type="checkbox"/>	<input type="checkbox"/>	

**18. Accepts responsibility and follows through on tasks. (PROF2)**

Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PROF2-01	Demonstrates appropriate professional appearance (1 month); Recognize the scope of his/her abilities and ask for supervision and assistance appropriately; When indicated, identify and assist colleagues in need of assistance in the provision of duties	Through his/her actions, serve as a professional role model for peers and learners	Contribute to the fiscally sound practice of an office		as demonstration of personal accountability.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROF2-02	Respond promptly and appropriately to clinical responsibilities including but not limited to calls and pages; Carry out timely interactions with colleagues, patients, and their designated caregivers	Ensure prompt completion of clinical, administrative, curricular and research-related tasks			as a demonstration of the professional attribute of accessibility.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**19. Responds to each patient's unique characteristics and needs. (PROF3)**

Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
PROF3-01	Represent individual patient	Address disparities in health			as a demonstration of being

	<p>needs; Show empathy and compassion to all patients; Take responsibility for situations where public health supersedes individual privacy (e.g. reportable infectious diseases)</p>	<p>care among populations that may impact patient care</p>		<p>an advocate for all patients.</p>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>PROF3-02</p>	<p>Treat patients with dignity, civility and respect, regardless of race, culture, gender, sexual orientation, socioeconomic status, literacy, and religious beliefs; Make efforts to support (physical, psychological, social, and spiritual) patients with acute and chronic, basic and complex rheumatic diseases and their caregivers.</p>			<p>as a demonstration of showing compassion and respect to patients.</p>
	<input type="checkbox"/>	<input type="checkbox"/>		

**20. Exhibits integrity and ethical behavior in professional conduct. (PROF4)**

**Rheumatology Curricular Milestones**

Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
<p>PROF4-01</p>	<p>Document and report clinical and research information truthfully; Follow formal policies; Accept personal errors and honestly acknowledge them; Maintain patient confidentiality; Uphold ethical expectations of clinical, scholarly activity and research including maintenance of up-to-date</p>				<p>as a demonstration of adhering to basic ethical principles.</p>

	certifications for all professional activities		
	<input type="checkbox"/>	<input type="checkbox"/>	
PROF4-02	Maintain and monitor patient care relationships with colleagues, members of the interprofessional team and office staff to; Use technology and social media appropriately to; Maintain ethical relationships with industry to; Addresses personal, psychological, and physical limitations that may affect professional performance to		manage conflicts of interest.
	<input type="checkbox"/>	<input type="checkbox"/>	

21. Communicates effectively with patients and caregivers. (ICS1)					
Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
ICS1-01	Use nonverbal skills, and without interruption; Ask thoughtful questions based on ability to				listen carefully to patients and caregivers to create rapport and build a therapeutic relationship.
	<input type="checkbox"/>	<input type="checkbox"/>			
ICS1-02	Use plain language, avoiding technical medical terms, to; Appropriately use an interpreter to	Encourage questions, answering clearly, incorporating new insights to			explain and counsel patients and caregivers about their problems, proposed examinations and treatments, and findings.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ICS1-03	Recognize the need to	Incorporate patient	Solicit and incorporate patient	Solicit and incorporate	share decision-making in

	incorporate patient preferences to	preferences to	preferences surrounding uncomplicated situations to	patient preferences surrounding ambiguous or controversial situations to	both diagnostic and therapeutic scenarios.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ICS1-04	Demonstrate sensitivity to	Actively seek to understand	Integrate into evaluation and management plans		differences in patients including, but not limited to race, culture, gender, sexual orientation, socioeconomic status, literacy, religious beliefs.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**22. Communicates effectively in interprofessional teams (e.g., with peers, consultants, nursing, ancillary professionals, and other support personnel). (ICS2)**

Rheumatology Curricular Milestones					
Number	By the listed time the fellow should be able to				For this curricular milestone
	6 months	12 months	18 months	24 months	
ICS2-01	Describe the importance of	Proactively initiate			communication with other healthcare providers in order to maintain appropriate continuity during transitions of care, including from pediatric to adult rheumatology care.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ICS2-02	Recognize the roles and acknowledge the contributions of individuals in support of	Interact, adapting and shifting roles as necessary, in support of	Initiate problem solving for; Assume a leadership role in the education of all members in support of		productive interaction within interprofessional teams.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ICS2-03	Utilize common technologies for	Tailor topic selection, presentation technology, and verbal and nonverbal skills for		Role model proficiency in tailored topic selection, presentation technology, and verbal and nonverbal skills for	effective presentation for the specific audience.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**23. Appropriate utilization and completion of health records. (ICS3)**

Rheumatology Curricular Milestones			
Number	By the listed time the fellow should be able to		For this curricular milestone

	6 months	12 months	18 months	24 months	
ICS3-01	Document through templates/scripts to create	Adjust communication on the basis of context, audience and/or situation for relevant and succinct,	Organize complex cases into relevant and succinct,		timely and legible authentic documentation that includes a differential diagnosis and clinical reasoning, and support for the appropriate level of reimbursement.
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## APPENDIX D. RHEUMATOLOGY TOOLBOX: ACTIVITIES AND ASSESSMENTS

### Rheumatology Toolbox for Tracking of Curricular Milestone Implementation

**Directions:** The Curricular Milestones are formatted in two different ways (Appendix C and below for the Rheumatology Toolbox). Utilizing the two far right columns in the Curricular Milestones tables, provided in the Rheumatology Toolbox, you may populate activities and assessment tools specific to your program that encompass each Curricular Milestone. You may utilize the provided list of activities and assessments and supplement with others that are unique to your program.

#### Activities

Experience	Activity
<b>Clinical experience in mentored setting</b>	General Rheumatology Continuity Clinic
	<ul style="list-style-type: none"> <li>• Outpatient clinic               <ul style="list-style-type: none"> <li>○ VA</li> <li>○ Satellite office</li> <li>○ Inflammatory arthritis</li> <li>○ Gout</li> <li>○ SLE</li> <li>○ Scleroderma</li> <li>○ Vasculitis</li> <li>○ Myositis</li> <li>○ Pediatric Rheumatology</li> <li>○ Osteoporosis</li> <li>○ Rheumatology/Dermatology</li> <li>○ Rheumatology/Pulmonary</li> <li>○ Musculoskeletal ultrasound</li> <li>○ Other</li> </ul> </li> </ul>
	Inpatient consult service (by site)
	Inpatient Rheumatology service (by site)
	<ul style="list-style-type: none"> <li>• Elective               <ul style="list-style-type: none"> <li>○ Physical Medicine and Rehab</li> <li>○ Sports medicine</li> <li>○ Orthopaedics</li> <li>○ Pediatric orthopaedics</li> <li>○ PT/OT</li> <li>○ Podiatry</li> <li>○ Pain management</li> <li>○ Rheumatology private practice</li> <li>○ Other</li> </ul> </li> </ul>
<b>Committee participation</b>	<ul style="list-style-type: none"> <li>• Participation on committee               <ul style="list-style-type: none"> <li>○ Division of Rheumatology</li> <li>○ Department of Medicine</li> <li>○ Regional</li> <li>○ National</li> </ul> </li> </ul>
<b>Didactics: Large group</b>	<ul style="list-style-type: none"> <li>• Rheumatology Grand Rounds</li> <li>• Medicine Grand Rounds</li> <li>• Rheumatology Core Curriculum Conference</li> <li>• Evidence-Based Medicine Conference</li> <li>• Rheumatology Journal Club</li> <li>• Basic Science Journal Club</li> <li>• Rheumatology Research Conference</li> <li>• Basic Science Conference</li> <li>• Immunology Conference</li> <li>• Rheumatology/Radiology</li> <li>• Rheumatology/Pathology</li> <li>• Professors Rounds</li> <li>• Rheumatology Case Conference</li> <li>• Other Grand Rounds(</li> <li>• Other interdisciplinary conference</li> <li>• Summer Rheumatology Review</li> </ul>
	Certificate/Degree program
	<ul style="list-style-type: none"> <li>• Attendance at               <ul style="list-style-type: none"> <li>○ Local Specialty Conferences</li> <li>○ Regional Specialty Conferences</li> <li>○ National Conferences                   <ul style="list-style-type: none"> <li>▪ ACR Annual Meeting</li> <li>▪ ACR Fellows' SOTA</li> </ul> </li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>▪ ACR SOTA</li> </ul>
<b>Didactics: Small group</b>	Faculty facilitated group discussion
	Workshop participation
<b>Self study</b>	Self Study Module
	<ul style="list-style-type: none"> <li>• Independent Readings <ul style="list-style-type: none"> <li>○ Textbook</li> <li>○ Journal articles</li> <li>○ Internet based research</li> <li>○ Internet based study</li> <li>○ Web-based modules</li> <li>○ Other</li> </ul> </li> </ul>
<b>Fellow projects and presentations</b>	<ul style="list-style-type: none"> <li>• Presentation by Fellow <ul style="list-style-type: none"> <li>○ Rheumatology journal club</li> <li>○ Basic science journal club</li> <li>○ Research conference</li> <li>○ Case conference</li> <li>○ Rheumatology Grand Rounds</li> <li>○ Community education</li> <li>○ Other</li> </ul> </li> </ul>
	Preparation of patient care portfolio
	<ul style="list-style-type: none"> <li>• Clinical research project</li> <li>• Basic science research project</li> </ul>
	<ul style="list-style-type: none"> <li>• QI</li> <li>• Patient safety project</li> </ul>
	<ul style="list-style-type: none"> <li>• Scientific writing</li> <li>• Abstract presentation <ul style="list-style-type: none"> <li>○ Poster</li> <li>○ Podium</li> </ul> </li> </ul>
<b>Simulation</b>	<ul style="list-style-type: none"> <li>• Simulation with models</li> <li>• Simulation with standardized patients</li> </ul>

### Assessment Tools

Methods	Rheumatology Assessment Tools
<b>Anatomic model</b>	<ul style="list-style-type: none"> <li>• Joint simulator</li> <li>• Cadaver lab</li> </ul>
<b>Direct Observation</b>	<ul style="list-style-type: none"> <li>• Mini CEX (clinical)</li> <li>• Mini-PEX (procedure)</li> </ul>
<b>ACR In training exam</b>	
<b>Multisource assessment</b>	<ul style="list-style-type: none"> <li>• Self- assessment</li> <li>• Faculty evaluations (rotations)</li> <li>• Faculty evaluations (3, 6 mo)</li> <li>• Research mentor evaluation</li> <li>• 360 degree (administrative, nursing, health professionals, technical staff)</li> <li>• Peer</li> <li>• Patient evaluations</li> <li>• Procedural Competency Assessment (arthrocentesis evaluation form, 6 months)</li> <li>• Semiannual Program Director review</li> <li>• ACGME Reporting Milestones by Clinical Competency Committee</li> </ul>
<b>Objective structured clinical exam (OSCE)</b>	
<b>Videotaped or recorded assessment</b>	
<b>Oral Examination</b>	
<b>Practice/billing audit</b>	Medical documentation review
<b>Presentation skills</b>	Feedback forms for presentations <ul style="list-style-type: none"> <li>• Rheumatology Journal Club</li> <li>• Basic Science Journal Club</li> <li>• Grand Rounds</li> <li>• Case Conference</li> <li>• Morbidity and Mortality</li> </ul>
<b>Project assessment</b>	<ul style="list-style-type: none"> <li>• QI</li> </ul>

<b>by faculty</b>	<ul style="list-style-type: none"> <li>• Research</li> </ul>
<b>Record/chart review</b>	
<b>Trainee experience narrative</b>	Reflection
<b>Review case/procedure log</b>	
<b>Review of drug prescribing</b>	
<b>Review of patient outcomes</b>	<ul style="list-style-type: none"> <li>• QI project</li> <li>• Registry review</li> </ul>
<b>Role play or simulations</b>	
<b>Simulations/models</b>	Joint injection
<b>Standardized patient exams</b>	
<b>Structured case discussions</b>	
	Portfolio review



## Rheumatology Curricular Milestones Tables

### MEDICAL KNOWLEDGE

Subspecialty Reporting Milestone	Rheumatology Curricular Milestones				Your Training Program	
	Number	By this time (months)	The fellow should be able to	For this curricular milestone	Activities	Assessment Tools
Clinical Knowledge (MK1)	MK1-01	12	Demonstrate basic	knowledge of the relevant structure and function of the musculoskeletal system, immune system and basic science for describing the pathophysiology of rheumatologic conditions.		
		24	Demonstrate comprehensive			
	MK1-02	6	Acknowledge the indications for	referrals to other subspecialists and ancillary services including orthopedics and rehabilitation medicine.		
		12	Independently distinguish indications for			
		18	Independently formulate specific consultative questions for			
	MK1-03	6	List	relevant mechanisms of action and potential adverse effects of agents used in the management of patients with rheumatologic conditions.		
		12	Explain			
		18	Differentiate subtle differences in			
	MK1-04	12	Report on	the anatomy, physiology and management of pain in patients with rheumatologic conditions.		
		18	Teach others			
	MK1-05	12	List	similarities and differences of the clinical presentation and management between adults and children with rheumatic conditions.		
		18	Describe in detail			
		24	Explain the significance of			
	MK1-06	6	In uncomplicated cases, construct	a differential diagnosis for rheumatologic conditions, including consideration of non-rheumatic diseases.		
		12	In cases demonstrating increasing complexity, construct			
		18	In highly complex cases, with multi-system involvement, construct			
24		Teach others to construct				
MK1-07	12	Demonstrate basic	knowledge regarding the need for preventive care in patients with rheumatic conditions.			
	18	Demonstrate comprehensive				
MK1-08	12	Demonstrate basic	knowledge to evaluate complex rheumatic diseases in the setting of multiple			

		18	Demonstrate comprehensive	coexistent conditions, including the effects of aging.		
	MK1-09	12	Demonstrate basic	knowledge of socio-behavioral sciences including but not limited to health care economics and medical ethics.		
		24	Demonstrate comprehensive			
<b>Knowledge of Diagnostic Testing and Procedures (MK2)</b>	MK2-01	6	Identify	indications, risks and benefits of rheumatologic diagnostic testing, including but not limited to immunoassays, synovial fluid analysis, routine blood chemistries, hematologic studies, coagulation studies, radiographs, and DXA scanning.		
		12	Describe			
		18	Differentiate			
		24	Teach			
	MK2-02	12	Explain	major findings and interpretation of rheumatologic diagnostic testing, including but not limited to immunoassays, synovial fluid analysis, routine blood chemistries, hematologic studies, coagulation studies, radiographs, and DXA scanning.		
		24	Teach others about			
	MK2-03	6	List	indications, risks and benefits for more advanced diagnostic tests including imaging techniques (isotopic, PET, CT and MRI scanning, angiography and musculoskeletal ultrasound) and pathologic examination of tissues involved with rheumatic diseases.		
		18	Explain			
		24	Differentiate			
	MK2-04	12	Explain	major findings and interpretation of more advanced diagnostic tests including imaging techniques (isotopic, PET, CT and MRI scanning, angiography and musculoskeletal ultrasound) and pathologic examination of tissues involved with rheumatic diseases.		
		24	Teach others about			
	<b>Scholarship (MK3)</b>	MK3-01	6	Demonstrate basic	knowledge of principles underlying critical appraisal of the medical literature.	
24			Demonstrate comprehensive			
MK3-02		6	List	basic biostatistical testing and epidemiological principles.		
		12	Describe			
		24	Explain the significance of			
		24	Implement and interpret			
MK3-03		12	Describe principles underlying research study design for	a scholarly project related to clinical practice, quality improvement, patient safety, medical education or research in collaboration with a faculty mentor.		
		18	Generate a hypothesis and select methodology for			
		24	Perform data collection and analysis for			
		24	Disseminate findings of			
		24	Recognize components of grant writing and submission for			
MK3-05		18	Prepare and submit an abstract	to demonstrate effective scientific writing skills.		
	24	Prepare and submit a peer-reviewed manuscript				

		24	Prepare and submit a non-peer reviewed manuscript for publication (e.g. clinical review, book chapter)			
	MK3-06	12	Effectively present orally at conferences, including but not limited to rheumatology grand rounds, lay education, local and national meetings	to disseminate scholarly work.		
		18	Present an abstract locally, regionally, or nationally			
	MK3-07	6	List	principles of informed consent as it pertains to investigation, involving human subjects.		
		12	Describe			
		12	Explain the significance of			
		12	Enact			

## PATIENT CARE

Subspecialty Reporting Milestone	Rheumatology Curricular Milestones				Your Training Program	
	Number	By this time (months)	The fellow should be able to	For this curricular milestone	Activities	Assessment Tools
Gathers and synthesizes essential and accurate information to define each patient's clinical problem(s). (PC1)	PC1-01	6	Obtain and report	a comprehensive, accurate history, including review of all available records, on patients with rheumatic symptoms and signs.		
		12	Formulate with relevance			
		18	Incorporate			
		18	Teach others the elements of			
	PC1-02	12	Perform and report	a comprehensive, accurate physical examination, using common and advanced techniques where applicable, on patients with rheumatic symptoms and signs.		
		18	Distinguish with relevance			
		18	Integrate			
		24	Teach others to perform			
	PC1-03	6	Order and review	diagnostic tests including, but not limited to, laboratory, imaging, electrodiagnostic and pathologic studies for the evaluation of the patient with rheumatic symptoms and signs.		
		12	Interpret			
		18	Incorporate			
		24	Teach others about the clinical application of			
	PC1-04	6	List the steps of	using a standardized approach to the interpretation of musculoskeletal plain radiographs.		
		12	Recognize normal anatomy			
18		Differentiate abnormal findings				
24		Teach others to detect abnormalities				
PC1-05	12	Describe applications, indications and limitations	using a standardized approach for the interpretation of musculoskeletal ultrasonography for diagnostic purposes.			
	24	Recognize normal anatomy				
	24	Differentiate abnormal findings				
PC1-06	6	Recognize the need to	collaboratively review imaging and tissue specimens with radiology and pathology services, respectively, to enhance patient safety and care			
	12	Without faculty member prompting,				
Develops and achieves comprehensive management plan for each patient. (PC2)	PC2-01	6	List the components of	a comprehensive treatment plan, based on clinical evidence, clinical context, and patient preferences, counsel patients, and assess response to therapy.		
		12	For uncomplicated presentations construct and implement			
		18	For complicated presentations construct and implement			
		24	Teach others to formulate			

	PC2-02	6	Describe state and federal regulations for prescription of controlled substances as part of	a pain management strategy of the care plan.		
		12	Describe non-pharmacologic and pharmacologic components of			
		12	Implement, and monitor response to therapy, patient compliance, and detect signs and symptoms indicative of analgesic abuse as part of			
	PC2-03	6	Describes indications and potential adverse events of	pharmacotherapy, including immunomodulatory agents, used in the management of patients with rheumatic diseases.		
		12	Obtains verbal or written informed consent for treatment with			
		18	Prescribe, monitor and assess response to			
		24	Teaches others to prescribe, monitor and assess response to			
	PC2-04	12	In comparison to adults, discuss the similarities and differences in drug disposition and its consequences regarding	pharmacotherapies for use in children and adolescents with rheumatic diseases.		
		12	List the currently used			
		24	Prescribe and adjust accordingly			
	PC2-05	12	Discuss how the changes in pharmacokinetics that occur with age affect	therapeutic and management strategies in the aging population with rheumatic diseases.		
		18	Prescribe and adjust appropriately			
		24	Teach others about			
	PC2-06	6	List options for	exercise and other rehabilitation strategies in the care of patients with rheumatic disorders.		
		12	Describe applications and indications for			
		18	Incorporate			
		24	Teach others to incorporate			
	PC2-07	6	With attending supervision	formulate and implement a management plan for patients with rheumatic emergencies (including organ or life threatening conditions), with a need for emergent, urgent or changes in level or goals of care.		
12		With attending supervision for complicated presentations				
24		Independently				
24		Teach others to				
<b>Manages patients with progressive responsibility and independence. (PC3)</b>	PC3-01	6	Describe the potential manifestations of	disease-related exacerbations and the influence of comorbid illness during the provision of longitudinal and customized care to patients with rheumatic diseases.		
		12	Formulate plans to screen for and manage			
		18	Implement and monitor plans for			
		24	Teach others to recognize and manage			
	PC3-02	6	Identify	disease- and treatment-related complications that may lead to long term morbidity, including the consideration for implications of comorbid diseases and the effects of aging.		
		12	Formulate plans to screen, assess severity, and manage			
		18	Implement and monitor plans to screen, assess severity, and manage			
		24	Teach others to recognize and manage			
	PC3-03	6	Recognize	the psychosocial aspects of rheumatic diseases.		
		18	Develop strategies to manage			
		24	Implement strategies to manage			
	PC3-04	6	List and describe the utility of	the varied validated instruments in the assessment of pain, disease activity, function, and quality of life over time to monitor and adjust therapy.		
12		Incorporate into practice				
18		Teach others to incorporate into practice				
<b>Skill in performing procedures. (PC4)</b>	PC4-01	6	With attending supervision	obtain verbal or written informed consent from patient or caregiver for procedures.		
		12	Independently			
		12	Teach others to			
	PC4-02	6	With attending supervision	perform procedures including arthrocentesis and joint and soft tissue injections.		
		18	With attending assistance for those that are			

	PC4-03	24	complicated or previously unperformed	perform procedures including arthrocentesis and joint and soft tissue injections with ultrasound guidance, when appropriate and feasible.		
		24	Independently			
		24	Teach others to			
		24	With attending supervision			
		24	With attending assistance for those that are complicated or previously unperformed			
	PC4-04	24	Independently	perform compensated polarized microscopy to examine and interpret synovial fluid.		
		24	Teach others to			
		6	With attending supervision			
		12	Independently			
		18	Teach others to			
<b>Requests and provides consultative care. (PC5)</b>	PC5-01	6	Identify the indications to	refer to other healthcare providers for the co-management of patients with rheumatic disease.		
		12	Proactively			
		18	Teach others why, when, and how to			
	PC5-02	6	Recognize the tissues commonly considered for	diagnostic biopsies (including, but not limited to, temporal artery, renal, lung, muscle, nerve, skin, minor salivary gland, and brain) in the evaluation of rheumatic diseases, and refers when indicated and appropriate.		
		12	List the indications, expected risks and benefits, and available alternatives for			
		18	Implement plans to refer for			
		18	Teach others how to incorporate			
	PC5-03	18	Identify opportunities for referral	to clinical registries and trials.		
		24	Refer when indicated			
	PC5-04	6	With attending supervision	provide consultation when requested, in support of the primary care relationship, for patients with rheumatic symptoms and signs and appropriately integrate recommendations from other healthcare providers into the evaluation and management plan.		
24		Independently				

**PRACTICE-**

**BASED LEARNING AND IMPROVEMENT**

Subspecialty Reporting Milestone	Rheumatology Curricular Milestones				Your Training Program	
	Number	Activities	Activities	For this curricular milestone	Activities	Assessment Tools
<b>Monitors Practice with goal for improvement (PBL1)</b>	PBL1-01	6	Acknowledge the importance of reflection to	identify(ied) knowledge or skills gaps to enhance future clinical interactions.		
		12	Routinely reflect on clinical interactions to			
		12	Describe his or her own efforts to			
		18	Seek resources to address			
	PBL1-02	18	Recognize	ways to improve his/her role in the effective management of a practice.		
	24	Implement				
<b>Learns and improves via performance audit. (PBLI2)</b>	PBLI2-01	6	Can describe what s/he	learns from errors.		
		18	Independently identify and describe what s/he			
		24	Demonstrate through actions taken to improve the system or processes of care that s/he			
	PBLI2-02	18	Identify an area of inquiry to direct	an audit of a panel of patients using standardized, disease-specific, and evidence-based criteria.		
		24	Design the method for			
	24	Perform and analyze				

		24	Reflect on and hypothesize an explanation for deficiencies found (including doctor-related, system-related, and patient-related factors) through			
		24	Change practice based on results of			
Learns and improves via feedback. (PBLI3)	PBLI3-01	12	Accept and reflect on	feedback from all members of the health care team including faculty, peers, students, nurses, allied health workers, patients and their advocates.		
		12	Actively seek and reflect on			
		12	Develop plans for practice improvement based on			
		12	Identify basic knowledge gaps and seek			
Learns and improves at the point of care. (PBLI4)	PBLI4-01	6	In all cases, independently construct and pursue	answers to clinical questions, and performs self-reflection to incorporate learning for future clinical encounters.		
		12	Independently			
	PBLI4-02	6	Teach others to	use(s) technology to manage information (HIPAA compliant), support patient care decisions using evidence-based medicine and enhance both patient and physician education.		
		12	With prompting from faculty			
	PBLI4-03	6	Independently	maintains awareness of the situation in the moment, and responds to meet situational needs.		
		12	Determines applicability of			
	PBLI4-04	12	Customizes management based on	clinical evidence for individualized patient care.		
		12				

## SYSTEMS BASED PRACTICE

Subspecialty Reporting Milestone	Rheumatology Curricular Milestones				Your Training Program	
	Number	By this time (months)	The fellow should be able to	For this curricular milestone	Activities	Assessment Tools
Works effectively within an interprofessional team (e.g. peers, consultants, nursing, therapists, nurses, home care workers, pharmacists, social workers and other ancillary professionals and other support personnel). (SBP1)	SBP1-01	6	Acknowledge the contributions from	health care providers from varied disciplines to promote patient-centered care.		
		12	Actively participate and work with			
	SBP1-02	6	Recognize the varied	health care providers who work to promote patient safety and to identify risks for and strategies to prevent medical errors.		
		12	Explain the contributions of			
	SBP1-03	24	Participate in the activities of	appropriate coding based on documentation and reimbursement policies.		
		6	List the individual components that contribute to			
		18	Ascribe levels of complexity to the components that comprise			
	SBP1-04	24	Implement	the spectrum of practice models for health care delivery, including the fundamentals of office and personnel management.		
		6	Describes			
		18	Differentiates among			
Recognizes system error and advocates for system improvement. (SPB2)	SBP2-01	24	Works effectively within	partnering with other healthcare teams and professionals to improve the quality of care and patient safety within the system.		
		6	Recognize situations leading to inefficiencies, safety concerns and/or preventable medical errors when			
		12	Participate in a system level quality improvement initiatives while			
	SBP2-02	24	Design and implement a system level quality improvement initiative while	recognize opportunities to address causes of disparity in disease and healthcare delivery.		
		12	Demonstrate ability to			
	24	Assist others within one's own system to				

		24	Assist the public to			
<b>Identifies factors that impact the cost of health care, and advocates for, and practices cost-effective care. (SBP3)</b>	SBP3-01	6	Recognize the necessity to integrate	cost awareness and cost benefit analysis for disease specific care as well as in individual patients.		
		18	Participate in decisions that reflect			
		24	Independently incorporate considerations of			
	SBP3-02	6	Recognize	barriers impacting patient care, including socio-economic factors, healthcare literacy, medical disability and health care insurance coverage.		
		18	Identify ways to address			
		24	Advocate for change of			
	SBP3-03	6	Implement measures to correct	the various health care settings (academic/public/private/VA) and stakeholders in the healthcare economy.		
		18	Identify			
		24	Describe the impact on health care cost and access by			
<b>Transitions patients effectively within and across health delivery systems. (SBP4)</b>	SBP4-01	6	Leverage the advantages, for individual patients, of	coordinate care across multiple delivery systems, including ambulatory, subacute, acute, rehabilitation and skilled nursing facilities.		
		18	Identify the providers, therapies, and potential obstacles to successfully			
		24	Discuss strategies to overcome the obstacles to successfully			
		24	Implement strategies to successfully			

## INTERPERSONAL AND COMMUNICATION SKILLS

Subspecialty Reporting Milestone	Rheumatology Curricular Milestones				Your Training Program	
	Number	By this time (months)	The fellow should be able to	For this curricular milestone	Activities	Assessment Tools
<b>Communicates effectively with patients and caregivers. (ICS1)</b>	ICS1-01	6	Use nonverbal skills, and without interruption	listen carefully to patients and caregivers to create rapport and build a therapeutic relationship.		
		6	Ask thoughtful questions based on ability to			
	ICS1-02	6	Use plain language, avoiding technical medical terms, to	explain and counsel patients and caregivers about their problems, proposed examinations and treatments, and findings.		
		12	Appropriately use an interpreter to			
	ICS1-03	6	Encourage questions, answering clearly, incorporating new insights to	share decision-making in both diagnostic and therapeutic scenarios.		
		12	Recognize the need to incorporate patient preferences to			
		24	Incorporate patient preferences to			
	ICS1-04	6	Solicit and incorporate patient preferences surrounding uncomplicated situations to	differences in patients including, but not limited to race, culture, gender, sexual orientation, socioeconomic status, literacy, religious beliefs.		
		12	Solicit and incorporate patient preferences surrounding ambiguous or controversial situations to			
		18	Demonstrate sensitivity to			
<b>Communicates effectively in interprofessional teams</b>	ICS2-01	6	Actively seek to understand	communication with other healthcare providers in order to maintain appropriate continuity during transitions of care, including from pediatric to adult rheumatology care.		
		12	Integrate into evaluation and management plans			

(e.g., with peers, consultants, nursing, ancillary professionals, and other support personnel). (ICS2)	ICS2-02	6	Recognize the roles and acknowledge the contributions of individuals in support of	productive interaction within interprofessional teams.		
		12	Interact, adapting and shifting roles as necessary, in support of			
		18	Initiate problem solving for			
		18	Assume a leadership role in the education of all members in support of			
	ICS2-03	6	Utilize common technologies for	effective presentation for the specific audience.		
		18	Tailor topic selection, presentation technology, and verbal and nonverbal skills for			
24		Role model proficiency in tailored topic selection, presentation technology, and verbal and nonverbal skills for				
Appropriate utilization and completion of health records. (ICS3)	ICS3-01	6	Document through templates/scripts to create	timely and legible authentic documentation that includes a differential diagnosis and clinical reasoning, and support for the appropriate level of reimbursement.		
		12	Adjust communication on the basis of context, audience and/or situation for relevant and succinct,			
		18	Organize complex cases into relevant and succinct,			

## PROFESSIONALISM

Subspecialty Reporting Milestone	Rheumatology Curricular Milestones				Your Training Program	
	Number	Activities	Activities	For this curricular milestone	Activities	Assessment Tools
Has professional and respectful interactions with patients, caregivers, and members of the interprofessional team (e.g., peers, consultants, nursing, ancillary professionals, and support personnel). (PROF1)	PROF1-01	12	Recognize and manage differences of opinion with patients to	demonstrate respectful professional interactions.		
		12	Recognize and manage differences of opinion with other members of the interprofessional team to			
		12	Provide constructive feedback to other members of the health care team to			
	PROF1-02	6	Provide responsible team leadership to	demonstrate respect for patient dignity and autonomy.		
	PROF1-03	6	Recognize, respond to, and report impairment in colleagues or substandard care via peer review process	as a demonstration of commitment to providing safe patient care.		
Accepts responsibility and follows through on tasks. (PROF2)	PROF2-01	6	Recognize the scope of his/her abilities and ask for supervision and assistance appropriately	as demonstration of personal accountability.		
		6	When indicated, identify and assist colleagues in need of assistance in the provision of duties			
		12	Through his/her actions, serve as a professional role model for peers and learners			
		24	Contribute to the fiscally sound practice of an office			



		1	Demonstrates appropriate professional appearance			
	PROF2-02	6	Respond promptly and appropriately to clinical responsibilities including but not limited to calls and pages	as a demonstration of the professional attribute of accessibility.		
		6	Carry out timely interactions with colleagues, patients, and their designated caregivers			
		12	Ensure prompt completion of clinical, administrative, curricular and research-related tasks			
<b>Responds to each patient's unique characteristics and needs. (PROF3)</b>	PROF3-01	6	Represent individual patient needs	as a demonstration of being an advocate for all patients.		
			Show empathy and compassion to all patients			
		12	Address disparities in health care among populations that may impact patient care			
		6	Take responsibility for situations where public health supersedes individual privacy (e.g. reportable infectious diseases)			
	PROF3-02	6	Treat patients with dignity, civility and respect, regardless of race, culture, gender, sexual orientation, socioeconomic status, literacy, and religious beliefs	as a demonstration of showing compassion and respect to patients.		
	6	Make efforts to support (physical, psychological, social, and spiritual) patients with acute and chronic, basic and complex rheumatic diseases and their caregivers.				
<b>Exhibits integrity and ethical behavior in professional conduct. (PROF4)</b>	PROF4-01	6	Document and report clinical and research information truthfully	as a demonstration of adhering to basic ethical principles.		
		6	Follow formal policies			
		6	Accept personal errors and honestly acknowledge them			
		6	Maintain patient confidentiality			
		6	Uphold ethical expectations of clinical, scholarly activity and research including maintenance of up-to-date certifications for all professional activities			
	PROF4-02	6	Maintain and monitor patient care relationships with colleagues, members of the interprofessional team and office staff to	manage conflicts of interest.		
		6	Use technology and social media appropriately to			
		6	Maintain ethical relationships with industry to			
		6	Addresses personal, psychological, and physical limitations that may affect professional performance to			

## The Pediatric “Top Ten”

This appendix is a more detailed discussion of some unique and important aspects of pediatric rheumatology, relevant to internist rheumatologists who may be evaluating children. It is by no means complete. The essential reference is the Textbook of Pediatric Rheumatology by Cassidy.

### 1. Pediatric musculoskeletal evaluation

Much can be inferred from the parent’s description of changes of usual habits, and the physician’s observation of the child’s mobility and behavior in the office. Young children can be difficult to examine because of anxiety and lack of cooperation. They are likely to feel more comfortable sitting on the parent’s lap or beside the parent on the examination table. Establish trust by allowing the child to handle the examining instruments first. Make a game of various portions of the exam, such as muscle strength testing and range of motion. Undress the child a little at a time, examining the non-painful areas first, and the reportedly painful areas last. Children may verbally deny pain, but show pain or tenderness by body language (flinching, withdrawing) or facial expression. Getting the patient to walk, and especially run, down the hall can be especially informative.

### 2. Juvenile Idiopathic Arthritis (JIA) - presentation

Serologic markers may be absent in JIA patients. The ESR may be normal even with severe joint inflammation. In oligoarticular JIA (4 or fewer joints), the ANA may be positive which predicts increased risk of the development of uveitis. In polyarticular JIA (5 or more joints), ANA and/or RF may be positive. A positive RF is associated with a worse prognosis (early erosive arthritis, deformity, nodules), and likely represents an early presentation of rheumatoid arthritis. Some RF negative patients can also have very destructive disease. In systemic onset JIA, the ANA and RF are only rarely positive.

Children with JIA may not express all the usual manifestations of inflammatory arthritis. In “dry synovitis,” no effusion is apparent, but painful limitation of motion is present. By contrast, some children with definite effusions or passive limitation of motion may exhibit little or no pain or tenderness. In general, children with JIA do not appear to be in as much pain as their adult counterparts, and swelling may be out of proportion to pain. In a child with pain out of proportion to swelling, multiple other diagnoses must be considered, including leukemia or lymphoma, bone or joint infection, and pain amplification disorders.

In systemic onset JIA, fever and rash may precede arthritis. The fever occurs every day but is not continuous, spiking 1-2 times daily with return to normal or subnormal in between. Systemic onset JIA is a diagnosis of exclusion. Thorough evaluation to rule out infections and neoplasms is necessary. Macrophage activation syndrome (MAS) in systemic onset JIA is similar to hemophagocytic lymphohistiocytosis in its manifestations of life-threatening hepatic dysfunction, coagulopathy, cytopenias, and capillary leak syndrome. An unexpected rapid fall in sedimentation rate (with persistently elevated CRP) may signal the onset of MAS.

JIA, like any chronic inflammatory disease, can retard the overall growth of children. Arthritis can severely affect the growth of individual limbs or digits, resulting in lifelong limb-length discrepancy. Single joint arthritis with actual or functional length discrepancy can lead to altered body mechanics (example, knee contracture leading to pelvic tilt and scoliosis). TMJ arthritis can lead to micrognathia and orthodontic problems. Uveitis may be asymptomatic and is rarely apparent on routine examination, but leads to severe sequelae if untreated. The age of onset, type of arthritis, and ANA positivity determine the recommended schedule of ophthalmology examinations for surveillance of uveitis.

### 3. JIA – treatment

Goals of treatment are to normalize joint function, prevent deformity and disability, and preserve normal growth and development. Usual treatment of JIA includes early initiation of DMARDs and/or biologic agents (for polyarticular JIA), and appropriately spaced joint injections. In systemic onset JIA, oral or intravenous corticosteroids are indicated for severe anemia, pericardial/pleural effusions, and biologic agents, particularly IL-1 inhibitor therapy, are now recommended for steroid-sparing treatment of systemic onset JIA. Treatment of MAS in these patients may include pulse corticosteroids, cyclosporine A, and use of biologics (IL-1 or IL-6 inhibitors) to treat the underlying inflammatory process. Physical therapy is important for preventing contractures and maintaining normal mobility.

### 4. Hip pain

The child who limps and seems to have knee pain may have a hip abnormality. JIA rarely starts in the hip alone. Isolated hip arthritis may be a presenting feature of enthesitis related arthritis or psoriatic arthritis. Other causes of isolated hip pain or effusion that must be considered first include septic arthritis, osteomyelitis, transient synovitis, neoplasms (lymphoma, neuroblastoma, primary bone tumors), avascular necrosis, slipped capital femoral epiphysis, and congenital hip dysplasia (in a younger age group). X-rays and ultrasound are important in the initial evaluation of hip pain. Even if bacterial infection is not suspected, moderate or large hip effusions should be aspirated to decompress the arterial supply to the head of the femur (running externally over the femoral neck) and prevent secondary avascular necrosis.

## 5. Back pain

**Back pain is rare in children, and should be taken seriously.** In general, the younger the child, the more likely the complaint of back pain is due to serious non-rheumatic disease. Causes of back pain in children include osteomyelitis, discitis, spinal cord tumors, pelvic tumors, and spondylolisthesis. Enthesitis related arthritis most often presents with arthritis and/or enthesitis in peripheral joints, especially of the lower extremities, years before onset of axial inflammation/back pain. Because X-ray diagnosis is not sufficiently reliable for these conditions, bone scan and MRI are important tools for evaluation of children with back pain. It is possible for adolescents to have functional back pain; however, evaluation should be performed to rule out more serious causes.

## 6. Myositis

Juvenile dermatomyositis (JDM) is much more frequent in children than polymyositis. The characteristic rash usually precedes or accompanies muscle involvement. Muscle weakness without rash should prompt a thorough search for non-rheumatic causes including muscular dystrophy, metabolic muscle disease, and neurologic disorders. Unlike dermatomyositis in adults, JDM is rarely associated with neoplasia (anecdotal reports of malignancy are available). JDM may present at a very young age, with onset before age 3 years in up to a quarter of patients. In a young child, a malar rash should suggest JDM before lupus. Parents may note only a decrease in activity level or motor tasks, and may attribute these changes to pain rather than weakness.

Initial treatment of JDM is high-dose corticosteroids (oral and often IV pulse therapy), with or without methotrexate. Severe cases may benefit from intravenous immunoglobulin (IVIG). Cutaneous and gastrointestinal ulceration may occur in severe cases. With appropriate treatment, complete resolution of disease occurs in approximately a third of cases, allowing medications to be tapered off during 1-2 years (monophasic course). Other children will have a relapsing (polyphasic) course, but eventually recover. Up to 30% will have a chronic continuous course. Prolonged inflammation is associated with calcinosis, permanent loss of muscle mass, fixed joint contractures, and cutaneous atrophy and scarring.

Viral-associated myositis can be seen after a respiratory illness and cause bilateral leg pain, especially in the calves. Influenza A and B are the most common causes of this disorder, which is self-limited and may be treated conservatively. Occasionally, rhabdomyolysis can occur and is severe enough to cause renal damage.

## 7. Child-specific aspects of drug therapy

Corticosteroids: Aside from the usual side effects of corticosteroids, children also experience growth failure and pubertal delay. Osteoporosis due to chronic steroid treatment is both a short-term and long-term problem, since bone accretion occurs during childhood. Acne and weight gain create noncompliance issues with adolescents.

Drug dosing: Because of more rapid metabolism, children may need proportionately higher drug doses than adults. Methotrexate is a good example; the usual dose for JIA is 10 mg per m<sup>2</sup> (approximately 0.4 mg/kg) weekly, but may be increased to 20 mg per m<sup>2</sup> with careful monitoring for toxicity. The only NSAIDs with FDA indications for JIA are naproxen (10 mg/kg/day), ibuprofen (30-40 mg/kg/day), tolmetin (15-30 mg/kg/day) and choline magnesium trisalicylate (50mg/kg/day, or titrate to salicylate level). Although higher doses per kg are sometimes used, the doses listed are per package insert, and are not to exceed adult doses. Other NSAIDs have been used "off-label," many without appropriate dosing studies.

## 8. Self-limited forms of arthritis

Objective arthritis must last at least 6 weeks for a diagnosis of JIA. Post-infectious syndromes, especially post-viral synovitis, are common in children and usually resolve within 6 weeks. Transient synovitis of the hip is common in young children, and may be a post-infectious syndrome. For children with very painful joints, migratory arthritis, or fever, evaluation for acute rheumatic fever is indicated even if no sore throat is recalled. A previous streptococcal pharyngitis may have been minimally symptomatic.

## 9. IgA Vasculitis (formerly known as Henoch-Schonlein Purpura, HSP)

This vasculitis is due to immune complexes containing IgA, and often occurs after upper respiratory infection. A purpuric rash is often seen in dependent areas, such as the ankles or buttocks. Other manifestations may precede the rash, making diagnosis of HSP initially difficult. Urticarial rash and migrating angioedema (often in odd locations) may precede the purpura. Other manifestations include arthritis, abdominal pain, and nephritis. Serious complications are rare but include intussusception, and hemorrhage in the GI tract, lungs, and CNS. The course may be recurrent over several months, but subsequent episodes tend to be less severe than the initial one. Nephritis may be a very late manifestation, beginning up to 3 months after onset of disease and thus it is essential that patients have renal function and urinalysis monitored closely for several months after the initial event. Most patients require only conservative care, with or without NSAIDs. Corticosteroids have not been shown to prevent the development of renal disease, although they may ameliorate some of the symptoms (abdominal pain, arthritis).

#### **10. Kawasaki Disease**

Manifestations include fever lasting for 5 or more days, non-exudative conjunctivitis, lymphadenopathy, mucous membrane inflammation (strawberry tongue, red cracked lips, diffusely red oropharynx), polymorphous rash, and swollen hands and feet. Infants and younger children tend to have more atypical or incomplete manifestations. Desquamation of fingertips and thrombocytosis are late manifestations. Treatment with aspirin and intravenous immunoglobulin (IVIG), if started within 10 days of onset of fever, reduces the frequency of coronary artery aneurysms, the major life-threatening complication. Corticosteroids or TNF inhibitors may have a role in treating disease that is severe or unresponsive to IVIG.

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