



الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Adult Rheumatology



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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We would also like to acknowledge that the CanMEDS framework is a copyright of the Royal College of Physicians and Surgeons of Canada, and many of the description's competencies have been acquired from their resources (Please refer to: CanMEDS 2015 physician competency framework; Frank JR, Snell L, Sherbino J, editors. CanMEDS 2015 Physician Competency Framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.).

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FOREWORD

In this curriculum, we are adopting the CanMEDS framework, as it is an innovative, competency-based framework that describes the core knowledge, skills, and attitude of physicians. This curriculum is intended to provide a broad framework for fellows, faculty to focus on teaching, learning as well as clinical experience, and professional development during the training program. This does not intend to be the sole source of defining what is to be taught and learned during the residency training. Fellows are expected to acquire knowledge and skills as well as develop appropriate attitude and behavior throughout their training program and take personal responsibility in learning. They must learn from every patient encounter whether or not that particular condition or disease is mentioned in this curriculum.

This curriculum is part of the strategic planning of SCFHS to review and update the curricula of the training programs, it was developed and reviewed by The Scientific Council of Saudi Rheumatology Fellowship Program Board and International and local Advisors.

The Saudi Commission for Health Specialties, as it is represented by The Scientific Board, Rheumatology Medicine Fellowship Program Committee, and Central Accreditation Committee are committed to providing full support for the implementation of the curriculum by way of allocating necessary resources, providing faculty development, and establishing a monitoring system. Further reinforcements and continuous quality improvement process through feedback from fellows, trainers and program directors and site visits will be done by the Central Accreditation Committee and The Rheumatology Medicine Fellowship Program Scientific Board.

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INTRODUCTION

1. Context of Practice (Adult Rheumatology)

We begin by welcoming the reader to the world of rheumatology, one of the happiest and least burnout specialties of internal medicine.^{1,2}

Arthritis and musculoskeletal diseases are medical problems encountered daily in the practice of healthcare providers. If not tackled early, such conditions may lead to disabilities in a wide range of patients. Rheumatology services are becoming more popular, and thus more doctors are looking to subspecialize in rheumatology. The field of rheumatology has witnessed great advances in the last decade, particularly concerning investigations and treatments, which help rheumatologists provide better care to their patients

Rheumatology can be a very challenging yet rewarding career option for doctors. Major lifestyle benefits include:

- Work-life balance
- Exciting research opportunities
- High demand and competitive compensation
- Rewarding long-term patient relationships
- High impact on quality of life issues
- Variety of available fellowships

Past, present, and future of rheumatology in the Kingdom of Saudi Arabia

The Saudi Board for Certification in Rheumatology was founded in 2009, and the first program enrolled ten candidates from a single geographical region. By 2017, the number of candidates enrolled in the program (including first and second year fellows) had risen to 32, with the trainees distributed over three regions of the Kingdom of Saudi Arabia. The strategic plan is to increase the number of accepted trainees to 20 fellows by the year 2030, in parallel with recruiting more host centers from all regions of the Kingdom, following accreditation as per the rules and regulations of the Saudi Commission for Health Specialties (SCFHS). More than 40 fellows, including candidates from the Gulf Cooperation Council countries and Sudan, have graduated from the Saudi Rheumatology Fellowship Training Program (SRFTP) and been granted board certification in rheumatology.

2. Goal and Responsibility of curriculum implementation

The ultimate goal of this curriculum is to guide trainees to become *competent* in their specialty. This goal will require significant amount of efforts and coordination from all stakeholders involved in postgraduate training. As an “*adult-learner*” trainees have to demonstrate full engagement with *proactive* role by: careful understanding of learning objectives, self-directed learning, openness to reflective feedback and formative assessment, and self-wellbeing and seeking support when needed. Program director has a vital role to make the implementation of this curriculum most successful. Training committee members, and particularly program administrator and chief resident, have significant impact on the program implementation. Trainees should be enabled to share the responsibility in curriculum implementation. Saudi Commission for Health Specialties (SCFHS) will apply the best models of training governance to achieve the best quality of training. Academic affairs in training centers and regional

supervisory training committee will have major role in training supervision and implementation. The Rheumatology scientific committee will be responsible to make sure that the content of this curriculum is constantly updated to match the best-known standards in postgraduate education of their specialty.

Over 100 rheumatic diseases and conditions are currently recognized, including over 30 inflammatory rheumatic diseases such as rheumatoid arthritis, lupus, gout, scleroderma, juvenile idiopathic arthritis, Sjogren's syndrome, spondyloarthritides, polymyalgia rheumatica, and several forms of systemic vasculitis (granulomatosis with polyangiitis).³ Rheumatology is an important subspecialty of internal medicine that deals with acute and chronic inflammatory and non-inflammatory diseases including soft-tissue rheumatism such as rotator cuff tendinitis, autoimmune diseases such as rheumatoid arthritis and axial spondyloarthritis, connective tissue diseases such as systemic lupus erythematosus, chronic musculoskeletal pain syndromes such as fibromyalgia, and locomotor system disorders such as osteoarthritis.

Rheumatology deals with the diagnosis and treatment of a broad range of disorders that involve the musculoskeletal system, which often have an immunologic basis and are usually accompanied by an array of clinical and laboratory signs. Most patients with rheumatic disorders are diagnosed and managed on an outpatient basis. Hospitalized patients indicated for rheumatology consultation typically present a variety of challenging problems, ranging from regional complaints to complex, multi-system dysfunction. Intra-articular injections and aspirations are commonly used for the management of some rheumatic diseases. Such procedures can be performed blindly or with ultrasound guidance. Trained rheumatologists can also perform muscle, skin, nerve, and lip biopsies. However, managing rheumatic disorders requires extensive history taking, physical examination, investigations, treatments, and research. Moreover, successful practice in the field of rheumatology requires a multidisciplinary approach and knowledge in neurology, orthopedic surgery, physiatry, nursing, physiotherapy, and occupational therapy.

Recognizing the importance of rheumatology and the need for qualified specialists, the SCFHS offers a structured, joint fellowship program in Rheumatology. The program aims to certify competent rheumatologists capable of providing long-term evaluation, care, and counselling of patients with arthritis or rheumatic diseases, in addition to assuming faculty and leadership positions in Rheumatology.

3. What is new in this edition?

This curriculum replaces the previous version of the Saudi Rheumatology Fellowship Training Program SRFTP curriculum, dated April 2009. The revisions ensure conformance with the updated SCFHS regulations and the framework laid out by the Canadian Medical Education Directions for Specialists (CanMEDS). The present version of the SRFTP curriculum follows the competency-based framework adopted by the SCHS. In addition, the following changes have been included in this version:

All rotations of the fellowship program, as well as educational activities, are now described in a competency-based format with clear objectives according to the roles defined in the CanMEDS framework for the subspecialty of Rheumatology: Medical Expert, Communicator, Collaborator, Leader, Health Advocate, Scholar, and Professional.

Major changes were made regarding the duration of rotations (from monthly to weekly timing) and related definitions (four weeks are now considered to make up one block). The list of the most important clinical topics and procedures in rheumatology and the list of universal topics have been expanded. The methods of assessment for every rotation have been revised, and drastic changes have been made. New assessment tools for evaluation and promotion to the next level in training have been approved. Such tools include structured oral examination (SOE), objective structured clinical examination (OSCE), and assessment of academic activities. New regulations regarding attendance and punctuality have been added.

A new section about mentoring has been added. A new section on rules and regulations has been added. This section deals with the job description of fellows and chief fellows, as well as with the levels of supervision. The responsibilities of junior (first-year) and senior (second-year) fellows, including the choosing of the chief fellow.

4. Policies and Procedures

This curriculum represents the means and materials outlining learning objectives with which trainees and trainers will interact for the purpose of achieving the identified educational outcomes. Saudi Commission for Health Specialties (SCFHS) has a full set of "General Bylaws" and "Executive Policies" (published on the official SCFHS website) that regulate all processes related to training. General bylaws of training, assessment, and accreditation as well as executive policies on: admission, registration, continuous assessment and promotion, examination, trainees' representation and support, duty hours, and leaves are examples of regulations that need to be applied. Trainees, trainers, and supervisors need to apply this curriculum in compliance with the most updated bylaws and policies which can be accessed online (via the official SCFHS website).

The SRFTP adheres to the rules and regulations of the SCFHS with respect to the rights and duties of trainees. These rules are freely distributed to all trainees in order to make them aware of their duties and rights regarding clinical and non-clinical issues, as well as to ensure that the SCFHS goals for the training programs are fulfilled. A complete copy of the relevant SCFHS rules and regulations are available on the SCFHS website.¹

Two sets of rules are relevant for this program:

- General regulations for training programs aiming to achieve Saudi board certification in a certain specialization (available online: <https://www.scfhs.org.sa/MESPS/TrainingProgs/RegulationBoard/Pages/default.aspx>)
- Duties and rights of the trainee enrolled in such a certification program (available online: <https://www.scfhs.org.sa/en/MESPS/Documents/General%20Bylaws%20of%20Traing%20in%20Postgraduate%20Programs.pdf>)

5. Abbreviations Used in This Document

Abbreviation	Description
SCFHS	Saudi Commission for Health Specialties
F(1)	(First) year of Fellowship
F(2)	(second) year of Fellowship
SRFTP	Saudi Rheumatology Fellowship Training Program
OSE	Oral Structural Examination
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
Mini-CEX	Mini-Clinical Experience report
DOPS	Direct Observation of Procedural Skills report
CBD	Case-Based Discussion report
CBE	Competency-Based Education
ITER	In-Training Evaluation Report
COT	Consultation Observation Tool
Blueprint	A tool that identifies the content areas covered on the examination. For each content area, the blueprint outlines the weighting of the area, the domains, and sections examined. The blueprint also provides details of the assessment tools used in the examination.
Competence	Possession of a satisfactory level of relevant knowledge and acquisition of a range of relevant skills that include interpersonal and technical components at a certain point in the educational process
External evaluator	An evaluator from a different country as the candidates who are being examined. The general role of the external evaluator is to ensure that the processes of examinations are fair and equitable according to the SCFHS' policies and regulations.
Portfolio	A systematic and organized collection of a candidate's work that exhibits to others the direct evidence of a candidate's efforts, achievements, and progress over a period.
Universal topics	A knowledge, skills, or professional behavior that is not specific to the given specialty but universal for the general practice of a given healthcare profession
Summative assessment	An assessment that describes the composite performance of the development of a learner at a particular point in time and is used to inform judgment and make decisions about the level of learning and certification.

PROGRAM STRUCTURE

1. Program Entry Requirements

Please refer to the updated executive policy of SCFHS on admission and registration.
Website: www.scfhs.org.sa

2. Program Durations

- The duration of the SRFTP is two (2) academic years, starting the beginning of the month of January.

1. Program structure for first-year fellows (F1)

The first year is split into 13 blocks, with each block consisting of four weeks. The trainee will spend ten blocks doing clinical rotations in general rheumatology, which will cover outpatient service, inpatient care and consultation, as well as emergency referrals. Another block will be spent as a rotation in radiology, aimed to help the candidate master the reading of conventional radiology, computed tomography, magnetic resonance, and ultrasound scans of the musculoskeletal system. Yet another block is split evenly between physiotherapy and immunology laboratory rotations. In the first two weeks of this block, the candidate must acquire knowledge about common physiotherapy techniques, prescriptions, and occupational therapy strategies for patients with destructive inflammatory arthritis such as rheumatoid arthritis. The last two weeks of this block are spent gaining knowledge about how common immunological tests (tests for antinuclear antibody (ANA), anti-double stranded DNA antibody [anti-dsDNA], anti-neutrophil cytoplasmic antibody [ANCA], and latex agglutination) and synovial fluid crystal analysis are performed and how their results are interpreted, as well as becoming familiar with the renal biopsy process in the pathology lab. Finally, one block is allocated to vacation (see Table 1). There is an in-training evaluation report (ITER) at the end of each rotation, based on which it is decided whether or not the candidate may proceed to the next rotation

2. Program structure for second-year fellows (F2)

The second-year fellows (F2) are given more responsibilities and independence in decision-making and caring for patients with rheumatic diseases, whether on an outpatient or inpatient basis. This includes consultations and procedures performed with the support of senior rheumatology staff. The candidates are expected to spend nine blocks on core rotations in rheumatology (management of outpatients and inpatients, as well as consultations). Another block is spent on rotation in pediatric rheumatology, to become familiar with common rheumatic

conditions in pediatric and adolescent patients. Trainees can do an elective rotation in any rheumatology field, with a maximum duration of one block. Since research is a mandatory part of the training curriculum of each trainee, one block is dedicated to the preparation and submission of the research project. Finally, the trainee is entitled to four weeks of vacation (see Table 1). The candidate must successfully complete the ITER for each rotation in order to be eligible for completion of the training program.

3. Program Rotations

Overview of the SRFTP rotation blocks (first plus second year)

- **Adult Rheumatology**

Throughout the training program, the fellows are required to spend 19 blocks providing inpatient, outpatient, and day care services at different host centers. In each host center, the fellows must be part of the on-call schedule.

- **Pediatric Rheumatology**

The fellows should spend one block (4 weeks) becoming familiar with common rheumatic diseases in pediatric and adolescent patients.

- **Physiotherapy and Immunology Laboratory**

The fellow must spend two weeks in each section. This rotation is to be performed at a certified center that has adopted the CanMEDS framework in terms of competencies.

- **Research**

This 4-week rotation aims to demonstrate the fellow's knowledge of the principles and clinical implications of epidemiology and evidence-based medicine. The fellow is expected to: draft a research proposal for a medical research study; plan and execute the research; write up a research report and preferable to submit it for publication.

- **Radiology**

Fellows spend one rotation (one block) in a radiology department, becoming familiar with the basic principles of radiology (including ultrasound, magnetic resonance imaging, and plain X-ray) of the musculoskeletal system.

- **Elective**

The fellows can arrange one rotation in any area of their interest. The elective rotation will provide the fellow with the opportunity to gain additional training in a specialized area of interest

PROGRAM STRUCTURE

Structure of the Saudi Rheumatology Fellowship Training Program												
Rheumatology rotations for first-year fellows (F1)												
Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Block 9	Block 10	Block 11	Block 12	Block 13
ARhe	ARhe	ARhe	ARhe	ARhe	ARhe	Py/Lb	ARhe	ARhe	Rad	ARhe	ARhe	Vac
Rheumatology rotations for second-year fellows (F2)												
Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Block 9	Block 10	Block 11	Block 12	Block 13
ARhe	ARhe	ARhe	PRhe	ARhe	ARhe	ARhe	Elcv	RsCh	ARhe	ARhe	ARhe	Vac

ARhe=Adult Rheumatology* Py/Lb=Physiotherapy/Laboratory** Rad=Radiology**
 Vac=Vacation

PRhe=Pediatric Rheumatology** Elcv=Elective*** RsCh=Research**

(***Mandatory core rotation:** Set of rotations that represent program core component and are mandatory to do.

****Elective rotation:** Set of rotations that are related to the specialty, as determined by the scientific council/committee, and the trainee is required to do some of them.

*****Selective rotation:** Set of other rotations that is selected by trainee (directed by mentor/program director) to enhance competency acquisition of the specialty.)

LEARNING AND COMPETENCIES

1. Introduction to Learning Outcomes and Competency-Based Education

Training should be guided by well-defined “*learning objectives*” that are driven by targeted “*learning outcomes*” of a particular program to serve specific specialty needs. Learning outcomes are supposed to reflect the professional “*competencies*” that are aimed to be “*entrusted*” by trainees upon graduation. This will ensure that graduates will meet the expected demands of the healthcare system in relation to their particular specialty. *Competency-based education* (CBE) is an approach of “*adult-learning*” that is based on achieving *pre-defined, fine-grained, and well-paced* learning objectives that are driven from complex professional competencies.

Professional competencies related to healthcare are usually complex and entertain a mixture of multiple learning domains (knowledge, skills, and attitude). CBE is expected to change the traditional way of postgraduate education. For instance, time of training, though is a precious resource, should not be looked to as a proxy for *competence* (e.g. time of rotation in certain hospital areas is not the primary marker of competence achievement). Furthermore, CBE emphasizes the critical role of informed judgment of learner’s competency progress, which is based on a staged and formative assessment that is driven from multiple workplace-based observations. Several CBE models have been developed for postgraduate education in healthcare (example: CanMEDs by the Royal College of Physician and Surgeon of Canada (RCPSC), the CBME-Competency model by the Accreditation Council for Graduate Medical Education(ACGME), tomorrow’s doctor in UK and multiple others). The following are concepts to enhance the implementation of CBE in this curriculum:

Graduates of this two-year fellowship training program had already received SCFHS certification of residency training in Internal Medicine and thus are expected to fulfill the CanMEDS competencies and employ the CanMEDs framework in their daily clinical practice.

Goal

On completion of the SRFTP, trainees will be able to function as consultants with core competencies in Rheumatology, as per the SCFHS regulations, which require the physician to be able to perform assessment, investigation, management, and rehabilitation of patients with acute and chronic rheumatic disorders.

Competency:

The CanMEDS framework, which is applied in postgraduate training programs in many countries, offers a model of physician competencies that emphasizes not only medical expertise but also multiple additional non-medical expert roles, with the ultimate aim to help the physicians maximize their contribution in a relevant manner. Therefore, the SCFHS has adopted the CanMEDS framework to establish a core curriculum for all training programs, including the program leading to Saudi board certification in rheumatology. Upon completion of training, the fellow will have acquired a set of competencies enabling them to function effectively in all of the following roles:

- Medical expert
- Communicator

- Collaborator
- Leader
- Health advocate
- Scholar
- Professional

2. Mapping of Milestones

Role: Medical Expert

Definition

Medical Expert is the central physician role in the CanMEDS framework and defines the physician's clinical scope of practice.

Description

As a Medical Expert, the rheumatologist integrates all CanMEDS roles, applying medical knowledge, clinical skills, and professional values to provide high-quality, safe, patient-centered care. The level of care provided by the rheumatologist should reflect up-to-date knowledge and practice according to the latest guidelines and recommendations issued by international rheumatology societies.

Goals of care

Prioritize issues to be addressed in a patient encounter.

Establish the goals of care in collaboration with the patients and their families. Specific goals include slowing disease progression, treating symptoms, achieving cure, improving function, and palliation.

Establish a patient-centred management plan.

Implement a patient-centred care plan that supports ongoing care, follow-up on investigations, evaluation of response to treatment, and further consultation.

Key competencies

The graduates of fellowship training programs in rheumatology are able to:

1. Work efficiently as consultant rheumatologists fulfilling all CanMEDS roles to provide optimal, ethical, and patient-centered medical care within the scope of service defined for their position.
2. Establish and maintain clinical knowledge, skills, and attitude appropriate for the practice of rheumatology.
3. Perform a complete and adequate assessment of patients.
4. Use preventive and therapeutic intervention effectively
5. Recognize the limit of their own expertise and seek appropriate consultation from other health professionals.
6. Adequately prescribe therapeutics for rheumatic diseases
7. Demonstrate proficient and appropriate use of procedural skills.

Enabling competencies

The graduates of fellowship training programs in rheumatology are able to:

1. Work efficiently as consultant rheumatologists fulfilling all CanMEDS roles to provide optimal, ethical, and patient-centered medical care within the scope of service defined for their position
 - 1.1. Perform consultation including:
 - 1.1.1. Well-prepared, complete patient presentation
 - 1.1.2. Well-documented, appropriately timed assessment
 - 1.1.3. Preparation of recommendations in written or verbal form in response to a request from another health care professional
 - 1.2. Demonstrate effective application to all CanMEDS competencies relevant to their practice.
 - 1.3. Prioritize professional duties when they have to deal with multiple problems at the same time.
 - 1.4. Demonstrate medical expertise in issues other than patient care, such as educating the patients and advising governments.
2. Establish and maintain clinical knowledge, skills, and attitude appropriate for the practice of rheumatology
 - 2.1. Apply knowledge of clinical, socio-behavioral, and fundamental biomedical sciences relevant to rheumatology.
 - 2.1.1. Basic sciences
 - 2.1.1.1. Anatomy and physiology Anatomy and physiology Anatomy and physiology
 - Basic physiology and anatomy (gross and microscopic), as well as biology of musculoskeletal tissues: for each tissue, understand the embryology, development, biochemistry, and metabolism, structure, function, and classification.
 - Joints and ligaments: diarthrodial joints, intervertebral discs, synovium, cartilage
 - Mechanisms of joint deformities and structural abnormalities in rheumatic disease
 - Connective tissue cells and components: fibroblasts, collagens, proteoglycans, elastin, matrix glycoproteins
 - Bone development, structure, turnover, and remodeling; the role of osteoclasts, osteoblasts, osteocytes; hormonal and cytokine regulation
 - Muscles and tendons
 - Blood vessels and the endothelium
 - 2.1.1.2. Genetic contributions to rheumatic disease
 - Human leukocyte antigen (HLA) genes
 - Non-HLA genes
 - Single nucleotide polymorphisms.
 - 2.1.1.3. Immunology
Immune and inflammatory responses relevant to the pathogenesis of rheumatologic diseases, and the therapeutic strategies used for their management:
 - 2.1.1.3.1. Anatomy and cellular elements of the immune system immune system

- Lymphoid organs: gross and microscopic anatomy and function
- Specific cells: for each cell type, understand the ontogeny, structure, phenotype, function, and activation markers/receptors
- Monocytes and macrophages
- Lymphocytes: T cells, B cells (naive, memory, activated, regulatory, and innate natural killer cells), null cells
- Neutrophils and eosinophils
- Other cells: dendritic cells, mast cells, platelets, endothelial cells, and fibroblasts
- 2.1.1.3.2. Immune and inflammatory mechanisms
 - Antigens: types, structure, processing, presentation, and elimination
 - Superantigens: types, binding sites, and effect on the immune system
 - Major histocompatibility complex: structure, function, nomenclature and immunogenetics
 - B-cell receptors/immunoglobulins: structure, function, antigen binding, signaling, genetic basis, effector function
 - T-cell receptors: structure, function, antigen binding, signaling, genetic basis
 - Receptor-ligand interactions: adhesion molecules,
 - complement receptors, Fc receptors, and signal transduction
 - Complement/Kinin systems: structure, function, and regulation
 - Intracellular signal transduction
 - The inflammasome, neutrophil extracellular traps (NETs), NETosis
 - Acute-phase reactants and enzymatic defenses
- 2.1.1.3.3. Cellular interactions and immunomodulation
 - Cellular activation and regulation: for each cell type, understand the mechanisms of activation and suppression of function.
 - Understand the broad principles regarding the origin, structure, effect, site of action, metabolism, and regulation of cytokines
 - inflammatory mediators: origin, structure, effect, site of action, metabolism, and regulation
- 2.1.1.3.4. Immune responses
 - Immunoglobulin E-mediated: acute and late-phase reactions
 - Immunoglobulin-mediated: opsonization, complement fixation, and antibody-dependent cellular cytotoxicity
 - Immune complex-mediated: physiochemical properties and clearance of immune complexes

- Cell-mediated: cells and effector mechanisms in cellular cytotoxicity and granuloma formation
- Mucosal immunity: interactions between gut-associated lymphoid tissue and secretory immunoglobulin A (IgA)
- Immune complex-mediated pathologic immune responses : physicochemical properties and clearance of immune complexes, graft-versus-host response, abnormal apoptosis
- Other pathologic immune responses: natural killers, lymphokine-activated killers, graft-versus-host reaction
- 2.1.1.3.5. Immunoregulation
 - Tolerance: clonal selection, deletion, and anergy; antigen paralysis
 - Cell-cell interactions: collaboration and suppression; understand the collaboration among immune cells responsible for the control of immune response
 - Idiotypic networks: inhibition and stimulation
 - Cytokines
 - Chemokines
- 2.1.1.4. Metabolism of crystalline diseases
 - Purines: biochemistry, synthesis, and regulation
 - Uric acid: origin, elimination, and physicochemical properties
 - Relationship between immunodeficiency and enzyme deficiency in the purine salvage pathway: adenosine deaminase (ADA), purine nucleoside phosphorylase (PNP)-2
 - Crystal-induced inflammation: calcium crystal formation and metabolism
 - Genetic abnormalities associated with increased risk of crystal formation
- 2.1.1.5. Neurobiology of pain
 - Peripheral nociceptive pathways, afferent nerves
 - Central processing of nociceptive information
 - Bio-psychosocial model of pain
- 2.1.1.6. In-depth knowledge of the following aspects for each relevant condition forming the object of adult and pediatric rheumatology
 - Natural history
 - Epidemiology
 - Pathogenesis
 - Clinical presentation (typical and atypical) and diagnosis
 - Classification criteria
 - Complications
- 2.1.2. Core clinical rotation in Adult Rheumatology
 - 2.1.2.1. Systemic connective tissue diseases
 - Rheumatoid arthritis
 - Lupus erythematosus (systemic, discoid, and drug-induced)
 - Scleroderma (localized syndromes, systemic sclerosis, chemically/drug-induced)

- Sjögren's syndrome
- Polymyositis and dermatomyositis
- Overlap syndromes including mixed connective tissue disease
- Polymyalgia rheumatica
- Adult-onset Still's disease
- Relapsing polychondritis
- Relapsing panniculitis
- Erythema nodosum
- Primary antiphospholipid antibody syndrome
- Undifferentiated connective tissue disease
- Periodic arthritis
- Eosinophilic fasciitis, eosinophilic myalgic syndrome
- 2.1.2.2. Seronegative spondyloarthropathies:
 - Ankylosing spondylitis
 - Reiter's syndrome
 - Psoriatic arthritis
 - Inflammatory bowel disease-associated arthritis
 - Arthritis associated with acne and other skin diseases, SAPHO syndrome (combination of synovitis, acne, pustulosis, hyperostosis, and osteitis)
 - Undifferentiated spondyloarthropathies
- 2.1.2.3. Vasculitides
 - Giant-cell arteritis
 - Takayasu's arteritis
 - Polyarteritis nodosa
 - ANCA-associated vasculitis:
 - Granulomatosis with polyangiitis (GPA; also known as Wegener's granulomatosis)
 - Eosinophilic granulomatosis with polyangiitis (EGPA; also known as Churg-Strauss syndrome)
 - Microscopic polyangiitis (MPA)
 - Behçet's disease
 - IgA vasculitis (Henoch-Schonlein purpura)
 - Hypersensitivity and small-vessel vasculitis
 - Cryoglobulinemia
 - Hypocomplementemic urticarial vasculitis
 - Isolated cutaneous vasculitis
 - Primary angiitis of the central nervous system
 - Isolated aortitis
 - Undifferentiated vasculitis
 - Cogan's syndrome
 - Anti-glomerular basement membrane disease
 - Vasculitis associated with systemic disorders, infections, drugs, or malignancies; polyangiitis overlap syndrome combined with necrotizing vasculitis
- 2.1.2.4. Infectious and reactive arthritides
 - 2.1.2.4.1. Infectious arthritides
 - Bacterial (nongonococcal and gonococcal) arthritis, especially associated with mycobacterial tuberculosis or brucellosis

- Spirochetal arthritis (associated with syphilis or Lyme's disease)
- Viral arthritis (following infection with human immunodeficiency virus [HIV], hepatitis B virus, parvovirus, or another virus)
- Fungal arthritis
- Parasitic arthritis
- Whipple's disease
- 2.1.2.4.2. Reactive arthritides
 - Acute rheumatic fever
 - Post-immunization arthritis
 - Arthritis associated with subacute bacterial endocarditis
 - Intestinal bypass arthritis
 - Post-dysenteric arthritides
 - Other colitis-associated arthropathies
- 2.1.2.5. Metabolic disorders: crystal-associated diseases
 - Monosodium urate monohydrate deposition disease (gout)
 - Diseases associated with the deposition of calcium pyrophosphate dihydrate, basic calcium phosphate (hydroxyapatite), and calcium oxalate
- 2.1.2.6. Rheumatic syndromes associated with other clinical conditions
 - Associated with endocrine diseases (diabetes mellitus, acromegaly, hyperparathyroidism, hypoparathyroidism, hyperthyroidism, hypothyroidism, Cushing's disease)
 - Associated with hematological disorders (hemophilia, hemoglobinopathies, angioimmunoblastic lymphadenopathy)
- 2.1.2.7. Bone and cartilage disorders
 - 2.1.2.7.1. Osteoarthritis:
 - Primary and secondary osteoarthritis
 - Chondromalacia patellae
 - 2.1.2.7.2. Metabolic bone diseases
 - Osteoporosis
 - Osteomalacia, bone disease related to renal disease
 - Paget's disease of bone
 - Avascular necrosis of bone (idiopathic, secondary causes), osteochondritis dissecans
 - Other: transient osteoporosis, hypertrophic osteoarthropathy, diffuse idiopathic skeletal hyperostosis
- 2.1.2.8. Hereditary, congenital, and inborn errors of metabolism associated with rheumatic syndromes
 - 2.1.2.8.1. Disorders of connective tissue:
 - Marfan's syndrome
 - Osteogenesis imperfecta
 - Ehlers-Danlos syndromes
 - Pseudoxanthoma elasticum
 - Hypermobility syndrome
 - 2.1.2.8.2. Mucopolysaccharidoses

- 2.1.2.8.3. Osteochondrodysplasias
 - Multiple epiphyseal dysplasia
 - Spondyloepiphyseal dysplasia
- 2.1.2.8.4. Inborn errors of metabolism affecting the connective tissue:
 - Homocystinuria
 - Ochronosis
- 2.1.2.8.5. Storage disorders
 - Gaucher's disease
 - Fabry's disease
 - Farber's lipogranulomatosis
- 2.1.2.8.6. Immunodeficiencies
 - IgA deficiency
 - Complement component deficiency
 - Severe combined immunodeficiency (SCID), ADA deficiency, PNP deficiency
- 2.1.2.8.7. Autoinflammatory syndromes
 - Familial Mediterranean fever
 - Hyperimmunoglobulinemia D syndrome (HIDS)
 - Tumor necrosis factor receptor-associated periodic syndromes (TRAPS)
 - Periodic fever, aphthous stomatitis, pharyngitis, cervical adenitis (PFAPA) syndrome
 - Blau syndrome
 - Behçet's syndrome
 - Schnitzler syndrome
 - Systemic juvenile idiopathic arthritis (SJIA)
 - Cryopyrin-associated periodic syndrome (CAPS), including Muckle-Wells syndrome
 - Other
 - Hemochromatosis
 - Hyperlipidemic arthropathy
 - Myositis ossificans progressiva
 - Wilson's disease
- 2.1.2.9. Nonarticular and regional musculoskeletal disorders
 - Fibromyalgia
 - Spinal stenosis
 - Intervertebral disc disease and radiculopathies
 - Cervical pain syndromes
 - Coccydynia
 - Osteitis condensans ilii
 - Osteitis pubis
 - Spondylolisthesis/spondylolysis, discitis
 - Bursitis
 - Tendinitis
 - Enthesitis occurring around individual joints
 - Other disorders occurring at specific joints
 - **Shoulder:** rotator cuff tear, subacromial bursitis, adhesive capsulitis, impingement syndrome

- **Wrist:** ganglion cyst, De Quervain's tenosynovitis, trigger finger (stenosing tenosynovitis), Dupuytren's contracture
- **Knee:** synovial plica syndrome, internal derangements, popliteal cyst
- **Foot/Ankle:** plantar fasciitis, Achilles tendinitis, Morton's neuroma
- **Other:** temporomandibular joint syndromes, costochondritis
- Biomechanical/anatomic abnormalities associated with regional pain syndromes: scoliosis, kyphosis, genu valgum, genu varum, leg length discrepancy, foot deformities
- Rheumatic syndromes associated with overuse injury (occupational, sports, recreational, performing arts)
- Issues forming the object of sports medicine (injuries, strains, sprains, nutrition, medication issues)
- Entrapment neuropathies: thoracic outlet syndrome, upper/lower extremity entrapments
- Other: peripheral neuropathies (polyneuropathy, small fiber neuropathy)
- Mononeuritis multiplex
- Complex regional pain syndrome (formerly, reflex sympathetic dystrophy), erythromelalgia
- 2.1.2.10. Neoplasms and tumor-like lesions
 - 2.1.2.10.1. Benign
 - Joint tumors: loose bodies, fatty and vascular lesions, synovial osteochondromatosis, pigmented villonodular synovitis, ganglion cysts
 - Tendon sheath tumors: fibroma, giant-cell tumor, nodular tenosynovitis
 - Bone tumors: osteoid osteoma, others
 - 2.1.2.10.2. Malignant
 - Primary tumors: synovial sarcoma, others
 - Secondary tumors: leukemia, myeloma, metastatic
 - Malignancy-associated rheumatic syndromes: carcinomatous polyarthritis, palmoplantar fasciitis, Sweet's syndrome
- 2.1.2.11. Muscle diseases
 - 2.1.2.11.1. Inflammatory
 - Polymyositis
 - Dermatomyositis
 - Inclusion body myositis
 - Myositis with connective tissue disease
 - Immune-mediated necrotizing myositis
 - Other (ocular/orbital myositis, focal/nodular myositis, eosinophilic myositis, granulomatous myositis)
 - 2.1.2.11.2. Metabolic
 - Primary
 - Glycogen storage diseases
 - Lipid metabolic disorders
 - Myoadenylate deaminase deficiency
 - Mitochondrial myopathies

- Secondary to nutritional, endocrine, or electrolyte disorders, as well as to intoxications or drug-induced reactions
- 2.1.2.11.3. Muscular dystrophies
- 2.1.2.11.4. Myasthenia gravis
- 2.1.2.12. Rheumatic diseases in special populations (geriatric population, pregnant women, dialysis patients, transplant patients)
- 2.1.2.13. Miscellaneous rheumatic disorders
 - Amyloidosis: primary, secondary, hereditary
 - Raynaud's disease
 - Sarcoidosis
 - Immunoglobulin G4 disease
 - Charcot joint
 - Remitting seronegative symmetrical synovitis with pitting edema
 - Multicentric reticulohistiocytosis
 - Plant thorn synovitis
 - Intermittent arthritides: palindromic rheumatism, intermittent hydrarthrosis
 - Arthritic and rheumatic syndromes associated with scurvy, pancreatic disease, chronic active hepatitis, primary biliary cirrhosis, drugs, and environmental agents
- 2.1.3. Mandatory off-core rotations in Rheumatology
 - 2.1.3.1 Rotation in Pediatric Rheumatology

Many rheumatic diseases such as systemic lupus erythematosus (SLE) and scleroderma share the same clinical presentation in pediatric and adult patients, while other diseases are mainly described in the pediatric age group. The fellow should be able to recognize these diseases and maintain up-to-date clinical knowledge about this spectrum of conditions.

 - 2.1.3.1.1. Rheumatic diseases that occur in children with different presentation than that in adults
 - Juvenile idiopathic arthritis (JIA)
 - Systemic onset
 - Oligoarticular
 - Polyarthritides (rheumatoid factor-positive or negative)
 - Enthesitis-related
 - Psoriatic arthritis
 - Undifferentiated arthritis
 - Juvenile spondyloarthritis
 - Juvenile dermatomyositis
 - Kawasaki disease
 - IgA vasculitis (formerly, Henoch-Schonlein purpura)
 - Acute rheumatic fever
 - Neonatal lupus syndrome
 - Autoinflammatory syndromes
 - familial Mediterranean fever (FMF)
 - Hyperimmunoglobulinemia D syndrome (HIDS)
 - Tumor necrosis factor receptor-associated periodic syndromes (TRAPS)

- Periodic fever, aphthous stomatitis, pharyngitis, cervical adenitis (PFAPA) syndrome
 - Deficiency of interleukin-1 receptor agonist (DIRA)
 - Mageed 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)
 - Cryopyrin-associated periodic syndrome (CAPS) including
 - Muckle-Wells syndrome
 - Familial cold autoinflammatory syndrome
 - Neonatal-onset multisystem inflammatory diseases (NOMID)
- 2.1.3.1.2. Non-rheumatic disorders in children that can mimic rheumatic diseases:
- Infectious or post-infectious syndromes
 - Septic arthritis and osteomyelitis
 - Transient (toxic) synovitis of the hip
 - Post-infectious arthritis and arthralgia
 - Post-viral myositis
 - Orthopedic conditions
 - Legg-Calve-Perthes disease and other avascular necrosis syndromes
 - Slipped capital femoral epiphysis
 - Spondylolysis and spondylolisthesis
 - Patellofemoral syndrome
 - Non-rheumatic pain
 - Benign limb pain of childhood ("growing pains")
 - Benign hypermobility syndrome
 - Neoplasms
 - Leukemia
 - Lymphoma
 - Primary bone tumors (especially osteosarcoma and Ewing's sarcoma)
 - Tumors metastatic to bone (especially neuroblastoma)
 - Bone and cartilage dysplasias, and inherited disorders of metabolism
 - Marfan syndrome
 - Osteogenesis imperfecta
 - Ehlers-Danlos syndrome

- Pseudoxanthoma elasticum
 - Hypermobility syndrome
- 2.1.3.1.3. Non-articular rheumatism
 - Fibromyalgia
 - Pain amplification syndromes
 - Complex regional pain syndrome
- 2.1.3.1.4. Special considerations regarding rheumatic diseases and their treatment during in childhood
 - Disease effects on growth
 - Accelerated or decelerated growth of limbs or digits affected by arthritis
 - Altered growth of the mandible in arthritis of the temporo-mandibular joint
 - Short stature and failure to thrive
 - Regular surveillance for uveitis in JIA
 - Drugs
 - Food and Drug Administration-approved drugs for childhood rheumatic diseases
 - Pediatric dosing and special considerations in terms of pharmacokinetics and drug metabolism
 - Child-specific side effects of chronic glucocorticoid treatment
 - Growth retardation
 - Delay of puberty
 - Physical and occupational therapy
 - Exercises
 - Splinting
 - Psychosocial and developmental issues
 - Peer and sibling interaction
 - Family adjustment
 - School accommodations for disability
 - School and recreational activities
 - Transitioning to adulthood accompanied by a transition from pediatric to adult rheumatology care
- 2.1.3.1.5. Major sequelae and life-threatening complications of rheumatic diseases occurring primarily in children
 - Systemic-onset JIA
 - Hemophagocytic lymphohistiocytosis, macrophage activation syndrome
 - Cardiac tamponade
 - Pauciarticular JIA
 - Chronic uveitis
 - Juvenile dermatomyositis
 - Gastrointestinal vasculitis
 - Calcinosis
 - Joint contractures
 - Kawasaki disease
 - Aneurysms of the coronary and other arteries
 - IgA vasculitis (formerly known as Henoch-Schonlein purpura)

- Gastrointestinal intussusception
 - Intestinal infarction
 - Chronic nephritis
 - Neonatal lupus syndrome
 - Congenital heart block
 - Thrombocytopenia
- 2.1.3.2. Rotation in Physiotherapy and Rehabilitation
- 2.1.3.2.1. Physiotherapy and rehabilitation represent essential strategies in the treatment of rheumatologic disorders. During the training program, the fellow should gather enough experience with physiotherapy and rehabilitation so as to be able to make the best use of such services.
- 2.1.3.2.2. Effective rehabilitation and pain control are generally achieved using multidisciplinary approaches. It is very important for the rheumatologist to:
- Know when a certain method of treatment can be provided by the physiotherapist
 - Make appropriate use of referral to rehabilitation specialists, physiotherapists, and pain clinics
 - Perform appropriate assessment of the patient and prescribe the appropriate rehabilitation management.
 - Perform a regular follow-up assessment of the patient to prevent disability
 - Aim to minimize pain by using the most suitable methods in each case
- 2.1.3.2.3. The fellows should be aware of the latest methods of rehabilitation and physiotherapy, as well as to understand the principles, mechanism of action, indications, precautions, contraindications, potential side effects, and costs associated with each method. Common rehabilitation and physiotherapy methods include:
- Exercise
 - Rest and splinting
 - Thermal modalities
 - Ultrasound
 - Phoresis
 - Spa therapy
 - Icing
 - Acupuncture and dry needling
 - Sub-acute soft tissue injury treatment
 - Scapular stabilization exercises
 - Closed kinetic chain exercises
 - Active foot posture correction exercises
 - Biomechanical analysis
 - Orthotics
 - Soft tissue massage
 - Brace or support
 - Electrotherapy and local modalities

- Heat packs
 - Joint mobilization techniques
 - Kinesiology taping
 - Physiotherapy Instrument Mobilization (PIM)
 - Stretching exercises
 - Supportive taping & strapping
 - Transcutaneous electrical nerve stimulation (TENS)
 - Yoga
 - Use of adaptive equipment and assistive devices
 - Use of special footwear and orthotics
- 2.1.3.3. Rotation in Laboratory Diagnostic Investigations
- 2.1.3.3.1. The trainee should demonstrate basic understanding of the laboratory tests used in rheumatology.
- Understand the underlying principles and interpretation of results of synovial fluid analysis
 - Demonstrate knowledge and competency regarding the indication of laboratory tests.
 - Demonstrate knowledge and competency in the interpretation of results from laboratory tests to establish appropriate differential diagnosis of a rheumatologic disease
 - Understand the basic techniques used for different laboratory tests
- 2.1.3.3.2. The trainee should be able to understand the results of laboratory and diagnostic tests including evaluation of:
- Erythrocyte sedimentation rate
- C-reactive protein and acute phase reactant levels
 - Rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) antibody levels
 - ANA, anti-dsDNA, anti-Smith, anti-SSA, anti-SSB, anti-U1RNP, anti-centromere, anti-histone, anti-ribosomal P, anti-topoisomerase 1, and anti-RNA polymerase III antibody levels, as well as the lupus erythematosus cell test
 - Myositis-specific (anti-Jo-1 and other anti-synthetase; 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) antibody levels
 - The levels of other disease-associated auto-antibodies such as anti-mitochondrial, anti-smooth muscle, and anti-neuronal antibodies
 - Anti-neutrophil cytoplasmic antibody (anti-proteinase 3, anti-myeloperoxidase) levels
 - The levels of anti-phospholipid antibodies including rapid plasma regain (RPR), lupus anticoagulant, anti-cardiolipin antibody, and anti-beta-2-glycoprotein I antibody

- The levels of anti-red blood cell antibodies (using Coombs testing), anti-platelet antibodies, and anti-granulocyte antibodies
- Complement activity (CH50) and components of the complement cascade
- Serum immunoglobulin levels (using serum protein electrophoresis and immunofixation electrophoresis)
- HLA gene alleles (using HLA typing)
- Presence of streptococcal antibodies such as antistreptolysin O (ASO)
- Presence of antibodies for the Lyme disease agent, HIV, hepatitis B virus, hepatitis C virus, parvovirus, chikungunya virus, and other infectious agents (using serologic and polymerase chain reaction tests)
- Uric acid levels in the serum and urine
- Iron levels including ferritin
- Lymphocyte subsets and function (using flow cytometry analysis)
- Specific genetic abnormalities
- Diagnostic imaging findings; the fellow should possess a basic understanding of the underlying principles and technical considerations
- Synovial fluid characteristics
 - Absolute and differential cell counts
 - Presence of crystals
 - Viscosity and outcome of staining with special stains
 - Culture growth and sensitivity outcomes

2.1.3.4. Rotation in Radiographic Imaging

The fellow should be able to identify the most suitable radiological investigation and should understand the indications, principles, and results of different radiological modalities. Specifically, the fellow should be able to:

- List the indications, as well as be acquainted with the advantages and disadvantages of each radiographic method used to image the musculoskeletal system
- Recognize normal from abnormal appearance of various musculoskeletal structures on plain radiographs, computed tomography, magnetic resonance imaging, and nuclear scans
- Describe and identify the radiographic characteristics of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, osteoarthritis, gout, calcium pyrophosphate deposition disease, and myositis.
- Demonstrate understanding and competency in the assessment of radiographs of normal and diseased joints, bones, periarticular structures, and prosthetic joints
- Employ clinical knowledge to identify real clinico-radiographic correlations

- Review the musculoskeletal radiographs of patients seen in the clinic or hospital, correlate the radiologic findings with clinical history and/or laboratory examination results, and inform clinical decision making
- Establish good competency in radionuclide scanning techniques: joint and bone scans, parotid scans, salivary flow studies, bone densitometry
- Adequately review and interpret joint radiographs
- Achieve a solid understanding and interpretation of musculoskeletal radiological findings of the following tests:
 - Plain radiography of bones and joints
 - Computed tomography
 - Magnetic resonance imaging
 - Arteriography, magnetic resonance angiography, computed tomography angiography
 - Ultrasonography
 - Radionuclide scanning of bones, joints, periarticular structures, and vascular structures.
 - Bone densitometry

2.1.3.5. Research rotation

Fellows should demonstrate a basic knowledge of:

- 2.1.3.5.1. Research principles of basic science research and the process of scientific experimentation and hypothesis testing, including:
 - Creating a research question and formulating a hypothesis
 - Study design
 - Selection of subjects for the intervention and control groups
 - Replication of results to ensure reliability and validity of conclusions
 - Basic recognition of laboratory techniques
 - Statistical methods and data reporting
 - ANOVA, ANCOVA
 - Statistical significance and sample size
 - Data management, entry, security
- 2.1.3.5.2. Key skills in clinical research, including:
 - Defining the research objective and designing the study accordingly
 - Distinguish the critical components of clinical studies
- 2.1.3.5.3. Different designs of clinical trials
 - Phase I clinical trials
 - Phase IIa and IIb clinical trials
 - Phase III clinical trials
 - Randomized, double-blind, placebo-controlled trials
 - Cross-over trials
 - Randomized discontinuation trials
 - Open-label extensions of clinical trials
- 2.1.3.5.4. Inclusion and exclusion criteria
- 2.1.3.5.5. Concept of equipoise and its impact on study design

- 2.1.3.5.6. Statistical methods and reporting
 - Sensitivity and specificity calculations
 - Odds ratios, hazards ratio, relative risk, number needed to treat, number needed to harm
 - Statistical significance, sample size, and power calculations
 - Data management, entry, security
- 2.1.3.5.7. Epidemiological studies
 - Study design
 - Types: Retrospective, case series, case-control, cohort, cross-sectional
 - Analysis: incidence, prevalence, correlation, predictive variables
 - Outcomes measures
 - Patient-reported outcomes (e.g., quality-of-life assessment tools such as SF36; osteoarthritis assessment tools such as WOMAC; global assessment tools such as GAF)
 - Disease activity indices (e.g., DAS, RAPID3, CDAI, SLEDAI, BASDAI, PASI, and others)
 - Composite indices (e.g., BILAG, ACR Composite Index)
 - Quality improvement science
 - Plan-Do-Study-Act (PDSA) cycle
 - Team leadership skills
 - Comparative effectiveness research
 - Systematic review
 - Cost analysis (direct costs, QALY)
 - Critical literature review
 - Principles of evidence-based medicine
 - Critical appraisal of the literature
- 2.1.3.5.8. Research ethics

The fellow should be aware of research ethics principles and the role of the Institutional Review Board (IRB). Before starting their research project, the fellows should know how to write a research proposal and how to establish a clear research plan in accordance with well-established ethics standards:

 - Declaration of Helsinki
 - Data safety monitoring boards
 - Informed consent
 - Data management
 - Confidentiality
 - Informed consent documentation
- 3. Perform a complete and adequate assessment of patients

The fellow should identify and effectively explore issues to be addressed in a patient encounter, including the specific context of each case and the patient's preferences. For this purpose, the fellow will:

 - 3.1. Perform a suitable review of systems to obtain a history that is relevant, comprehensive, and accurate; assess the functional status of the patient.

- 3.2. Perform a focused physical examination that is relevant and accurate, including careful examination of all joints (peripheral and axial) and identification of any extra-articular manifestations of rheumatic diseases.
- 3.3. Assess disease activity.
- 3.4. Assess tissue damage and deformity.
- 3.5. Perform an assessment of function and quality of life.
- 3.6. Interpret the findings and suggest a sensible diagnosis.
- 3.7. Establish a therapeutic management plan.
- 3.8. Select medically appropriate investigative methods in an evidence-based, resource-effective, and ethical manner
- 3.9. Demonstrate knowledge of the scientific basis, indications/contraindications, limitations, and clinical interpretation of the findings of:
 - Specialized immunological and serologic investigations
 - Joint aspiration and synovial fluid analysis
 - Tissue biopsies
 - Electromyography and nerve conduction studies
 - Diagnostic imaging of joint and musculoskeletal diseases
- 3.10. Demonstrate effective clinical problem solving and judgment to address patient problems, including interpreting available data and integrating information to generate differential diagnoses and management plans.
4. Use preventive and therapeutic interventions effectively
 - 4.1. Implement a therapeutic management plan in collaboration with the patient and their family
 - 4.2. Demonstrate appropriate and timely application of preventive and therapeutic interventions relevant to the practice of rheumatology
 - Non-pharmacological therapy
 - Pharmacologic and biologic therapy, including plasma exchange and intravenous immunoglobulin (IVIg) therapy
 - Joint and soft tissue injections
 - Complementary medicine
 - 4.3. Obtain appropriate informed consent for the necessary therapies
 - 4.4. Ensure patients receive appropriate end-of-life care
 - 4.5. Demonstrate support of the patient and family, as appropriate
5. Seek appropriate consultation from other health professionals

The fellows shall recognize the important contributions of the multidisciplinary team members in the care of patients with arthritis-related conditions. Such a team includes, but is not limited to, nurses, physiotherapists, occupational therapists, social workers, dieticians, and pharmacists. The fellows are expected to:

 - Demonstrate awareness of the limits of their own expertise
 - Proceed with effective, appropriate, and timely consultation of another health professional, as needed for optimal patient care
 - Arrange appropriate follow-up care services to patients and their families or caregivers.
6. Adequately prescribe therapeutics for rheumatic diseases
 - 6.1. Implement a therapeutic management plan in collaboration with the patient and their family
 - 6.2. Demonstrate appropriate and timely application of preventive and therapeutic interventions relevant to the practice of rheumatology
 - Non-pharmacological therapy
 - Pharmacologic and biologic therapy, including plasma exchange and intravenous immunoglobulin (IVIg) therapy

- Joint and soft tissue injections
- Complementary medicine
- 6.3. Obtain appropriate informed consent for therapies
- 6.4. Ensure patients receive appropriate end-of-life care
- 6.5. Demonstrate support of the patient and family as appropriate
The fellow should have detailed knowledge about all medication used in rheumatology, including the following:
- 6.6. Pharmacology
For each medication, the dosing, pharmacokinetics, metabolism, mechanisms of action, side effects, drug interactions, compliance issues, costs, and indications for use in specific patient populations (e.g., chronic kidney disease); this includes specifications for fertile, lactating, and pregnant women, as well as for fertile men, across all age groups
- 6.6.1. Nonsteroidal anti-inflammatory drugs
- 6.6.2. Glucocorticoids: topical, intra-articular, systemic
- 6.6.3. Systemic anti-rheumatic drugs
 - Disease-modifying antirheumatic drugs (DMARDs), small molecules
 - Anti-malarials
 - Sulfasalazine
 - Methotrexate
 - Leflunomide
 - Azathioprine
 - Cyclophosphamide
 - Mycophenolate
 - Calcineurin inhibitors
 - JAK kinase inhibitors
 - Phosphodiesterase inhibitors
 - Biologic agents:
 - Interleukin inhibitors (1, 6, 12, 17, 23)
 - Tumor necrosis factor inhibitors
 - T-cell co-stimulatory inhibitors
 - Anti-B cell therapies
 - Historically used agents such as gold compounds
- 6.6.4. Urate lowering therapy
 - Xanthine oxidase inhibitors
 - Allopurinol
 - Febuxostat
 - Uricosuric drugs
 - Probenecid
 - Uricase agents
 - Pegylated uricase
 - Rasburicase
- 6.6.5. Bone disorder medications
 - Bisphosphonates
 - Alendronate
 - Risedronate
 - Ibandronate
 - Zoledronic acid

- Anabolic agents
 - Teriparatide
- RANKL inhibitors
 - Denosumab
- Hormonal therapy
 - Estrogen
 - Selective estrogen receptor modulators
 - Calcitonin
- Calcium and vitamin D
- 6.6.6. Vasodilators
 - Calcium channel blockers
 - Topical nitrates
 - Prostacyclin analogs
 - Endothelin receptor antagonists
 - Phosphodiesterase inhibitors
 - Guanylate cyclase agonist
- 6.6.7. Antibiotic therapy for septic joints
- 6.6.8. Opioid and non-opioid analgesics
- 6.6.9. Colchicine
- 6.6.10. Agents used for pain modulation
 - Anti-depressants
 - Anti-convulsants
 - Pregabalin
 - Muscle relaxants
- 6.6.11. Anti-cholinergics and non-pharmacologic agents used for the treatment of sicca symptoms
- 6.6.12. Vaccines
- 6.6.13. Intravenous immunoglobulin (IVIg) therapy
- 6.6.14. Plasma exchange
- 6.7. Complementary and alternative medical practice
 - Diet counselling
 - Nutritional supplements
 - Acupuncture
 - Chiropractic
 - Physiotherapy
 - Acupuncture and dry needling
 - Sub-acute soft tissue injury treatment
 - Scapular stabilization exercises
 - Closed kinetic chain exercises
 - Active foot posture correction exercises
 - Biomechanical analysis
 - Orthotics
 - Soft tissue massage
 - Brace or support
 - Electrotherapy and local modalities
 - Heat packs
 - Joint mobilization techniques
 - Kinesiology taping
 - Physiotherapy Instrument Mobilization (PIM)
 - Stretching exercises

- Supportive taping and strapping
 - Transcutaneous electrical nerve stimulation (TENS)
 - Yoga
7. Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic
- 7.1. Demonstrate effective, appropriate, and timely performance of diagnostic and therapeutic procedures in the field of rheumatology, including joint and soft tissue aspiration and/or injections and synovial fluid analysis, as well as accurate use of polarized microscopy for crystal analysis, as needed. The main procedures used in rheumatology are arthrocentesis and injection. Thus, the fellows are expected to become proficient in such procedures.
- 7.1.1. For those training in Adult Rheumatology, arthrocentesis and injection of the following:
- Shoulders, elbows, wrists and metacarpophalangeal joints
 - Knees, ankles, and metatarsophalangeal joints
 - Soft tissue
 - Flexor tendon sheaths – e.g., bicipital, palmar
 - Plantar fascia, medial and lateral epicondyle
 - Bursae – e.g., subacromial, trochanteric, anserine
- 7.1.2. For those training in Pediatric Rheumatology, arthrocentesis and injection of the following in children and adolescents:
- Shoulders, elbows, wrists, and metacarpophalangeal joints
 - Knees, ankles, and metatarsophalangeal joints
 - Flexor tendon sheaths
 - Bursae
- 7.1.3. Demonstrate knowledge of the indications and contraindications for sedation and analgesia as required for patients undergoing rheumatologic procedures.
- 7.1.4. Demonstrate knowledge of the indications and appropriate use of imaging guidance in arthrocentesis and injection.
- 7.2. Obtain appropriate informed consent for the necessary procedures.
- 7.3. Document and disseminate information related to the procedures performed and their outcome.
- 7.4. Ensure adequate follow-up is arranged for all procedures performed
- 7.5. Surgical and perioperative management
- 7.5.1. For each procedure, the fellow should demonstrate a working knowledge of indications, pre-operative evaluation, medication adjustments, contraindications, complications, postoperative management, and expected outcome.
- Bone biopsy
 - Arthroscopy
 - Synovectomy of tendons and joints
 - Entrapment neuropathy release
 - Osteotomies: hip, knee
 - Arthrodesis
 - Spine surgery for radiculopathy or stenosis
 - Reconstructive surgery of the hand and foot
 - Total joint replacement
- 7.5.2. Specific surgical management problems
- Patients with rheumatoid arthritis
 - Infected joint: arthroscopy vs. arthrotomy

- Infected prosthetic joint
- Patients with ankylosing spondylitis
- Pediatric patients with rheumatic disease
- Prevention and treatment of deep venous thrombosis
- Management of peri-operative anti-rheumatic medication

Role: Communicator**Definition**

As *Communicators*, rheumatologists effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.

Key and enabling competencies

By the end of training, the Rheumatology fellows are able to:

1. Develop rapport, trust, and ethical therapeutic relationships with the patients and their families
 - 1.1. Recognize that being a good communicator is a core skill for the physician, and that effective physician-patient communication can foster patient satisfaction, physician satisfaction, adherence, and improved clinical outcomes
 - Establish positive therapeutic relationships with patients and their families; such relationships are characterized by understanding, trust, respect, honesty, and empathy
 - Respect patient privacy, confidentiality, and autonomy
 - Listen effectively
 - Be aware of and responsive to nonverbal cues
 - Effectively facilitate a structured clinical encounter
2. Accurately elicit and synthesize relevant information and perspectives of patients and their families, of colleagues, and of other health professionals
 - 2.1. Gather information about the disease and about the patient's beliefs, concerns, expectations, and illness experience
 - 2.2. Seek out and synthesize relevant information from other sources, such as the patient's family, caregivers, and other professionals, while respecting each individual's privacy and confidentiality
3. Deliver information to the patient and their family, to colleagues, and to other health care professionals in a humane manner and in such a way that it is understandable and encourages discussion and participation in decision making
4. Develop a common understanding regarding key topics, problems, and plans with the patients and their families, as well as with other professionals to facilitate the development of a shared plan of care
 - 4.1. Identify and effectively explore problems to be addressed in the patient encounter, including the patient's context, responses, concerns, and preferences
 - 4.2. Respect diversity and differences, including but not limited to the impact of
 - gender
 - religion
 - cultural beliefs
 - age
 - sexual orientation
 - socioeconomic status
 - 4.3. Encourage discussion, questions, and interaction in the patient encounter

- 4.4. Engage the patients and their families, as well as relevant health professionals, in shared decision-making to develop a plan of care relevant to managing acute and chronic rheumatologic, connective tissue, or musculoskeletal disorders
- 4.5. Address challenging communication issues effectively, including but not limited to obtaining informed consent, delivering bad news, and addressing anger, confusion, and misunderstanding
5. Effectively convey oral, written, and/or electronic information about a medical encounter
 - 5.1. Maintain clear, concise, accurate, and appropriate records of clinical encounters and plans
 - 5.2. Deliver oral reports of clinical encounters and plans
 - 5.3. Convey medical information appropriately to ensure safe transfer of care
6. Effectively present medical information about a medical issue to the public

Role: Collaborator**Definition**

As *Collaborators*, rheumatologists work effectively within a health care team to achieve optimal patient care.

Key and enabling competencies

By the end of training, the Rheumatology fellows are able to:

1. Participate effectively and appropriately in an inter-professional health care team, which is most often necessary to manage rheumatology disorders; such a team includes, but is not limited to:
 - Physical therapists
 - Occupational therapists
 - Nurses
 - Pharmacists
 - Orthopedic surgeons
 - Primary care providers
- 1.1. Describe the rheumatologist's roles and responsibilities to other professionals
- 1.2. Describe the roles and responsibilities of other professionals within the health care team
- 1.3. Recognize and respect the diverse roles, responsibilities, and competences of other professionals in relation to their own
- 1.4. Work with others to assess, plan, provide, and integrate care for individuals and groups of patients
- 1.5. Work collaboratively in other activities and tasks such as research, educational work, program review, and administration
- 1.6. Participate in inter-professional team meetings
- 1.7. Enter into interdependent relationships with other professions to ensure that the patients receive quality care
- 1.8. Be aware of the principles of team dynamics
- 1.9. Abide by team ethics, including confidentiality, resource allocation, and professionalism
- 1.10. Demonstrate leadership in a health care team, as appropriate
2. Work with other health professionals effectively to prevent, negotiate, and resolve inter-professional conflict
 - 2.1. Demonstrate a respectful attitude towards colleagues and members of the inter-professional team

- 2.2. Work with other professionals to prevent conflicts
- 2.3. Employ collaborative negotiation to resolve conflicts and address misunderstandings
- 2.4. Respect differences and the scopes of practice of other professions
- 2.4. Recognize their own differences, misunderstandings, and limitations that may contribute to inter-professional tension

Role: Leader**Definition**

As Leaders, rheumatologists are integral participants in health care organizations, establishing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the health care system.

Key and enabling competencies

By the end of their training, the Rheumatology fellows are able to:

1. Participate in activities that contribute to the effectiveness of their health care organization and system
 - 1.1. Work collaboratively with others in their organizations
 - 1.2. Participate in the process of quality evaluation and improvement, including patient safety initiatives
 - 1.3. Understand and describe the structure and function of the health care system as it relates to Rheumatology, including the roles of physicians at the interface of private and public health care in the Kingdom of Saudi Arabia, drug benefit coverage, and models of physician remuneration
2. Manage their practice and career effectively
 - 2.1. Set priorities and manage their time to balance patient care, practice requirements, academic activities, continuing medical education, and personal life
 - 2.2. Manage a practice, including finances and human resources
 - 2.3. Implement processes to promote improvement in their personal practice
 - 2.4. Employ information technology appropriately for patient care
3. Allocate finite health care resources appropriately
 - 3.1. Demonstrate an understanding of the importance of just allocation of health care resources, balancing effectiveness, efficiency, and access, with the ultimate goal of achieving optimal patient care
 - 3.2. Apply evidence and management processes for achieving cost-appropriate care
4. Serve in administration and leadership roles
 - 4.1. Participate effectively in committees and meetings
 - 4.2. Lead or implement change in health care
 - 4.3. Plan relevant elements of health care delivery, such as work schedules

Role: Health Advocate**Definition**

As *Health Advocates*, rheumatologists use their expertise and influence responsibly to advance the health and well-being of individual patients, communities, and populations.

Key and enabling competencies

By the end of their training, the Rheumatology fellows are expected to be able to:

1. Respond to the health needs and issues of individual patients as part of patient care
 - 1.1. Identify the health needs of individual patients

- 1.2. Identify opportunities for advocacy, health promotion, and disease prevention among individuals to whom they provide care
- 1.3. Demonstrate an appreciation of the possibility of competing interests between individual advocacy issues and the community at large
- 1.4. Describe the impact of musculoskeletal conditions on function and participation in work, school, and social settings
 - Formulate plans for return to work or school for patients with musculoskeletal conditions or other rheumatic diseases
 - Assist disabled patients in obtaining appropriate benefits
2. Respond to the health needs of the communities that they serve
Understand and describe the communities of practice
 - 2.1. Identify opportunities for advocacy, health promotion, and disease prevention in the communities that they serve, and respond appropriately; this includes, but is not limited to, working with the Saudi Society of Rheumatology, Saudi Rheumatology Charity Society, and other age- and disease-specific patient advocacy groups, as relevant to the field of rheumatology
3. Demonstrate an appreciation of the possibility of competing interests between the communities served and other populations
4. Identify the determinants of health for the populations that they serve, particularly as they relate to patients with chronic musculoskeletal and connective tissue disorders
 - 4.1. Identify the determinants of health of the population, including barriers to access to care and resources
 - 4.2. Identify vulnerable or marginalized populations within the served community, and respond appropriately
5. Promote the health of individual patients, communities, and populations
 - 5.1. Identify approaches to implement changes in a determinant of health of the populations they serve
 - 5.2. Understand how public policy can impact on the health of the populations served
 - 5.3. Identify points of influence in the health care system and its structure
 - 5.4. Be aware of the ethical and professional issues inherent in health advocacy, including conflict of interests, altruism, social justice, autonomy, integrity, and idealism
6. Demonstrate an appreciation of the possibility of inherent conflict between their role as a health advocate for a patient or community, and their role as a manager or gatekeeper
7. Describe the role of the medical profession in advocating collectively for health and patient safety

Role: Scholar

Definition

As *Scholars*, rheumatologists demonstrate a lifelong commitment to reflective learning, as well as to the creation, dissemination, application, and translation of medical knowledge.

Key and enabling competencies

By the end of their training, the Rheumatology fellows are able to:

1. Maintain and enhance professional activities through ongoing learning
 - Understand and apply the principles of maintenance of competence
 - Employ principles and strategies for implementing a personal knowledge management system
 - Recognize and reflect on learning issues in practice

- Implement a personal learning program to keep up-to-date and enhance areas of professional competence
- Conduct personal practice audits
- Pose an appropriate learning question
- Access and interpret the relevant evidence
- Integrate new learning into practice
- Evaluate the impact of any change in practice
- Document the learning process
- 2. Critically evaluate medical information and its sources, and apply this approach to clinical practice decisions
 - 2.1. Understand the principles of critical appraisal as they pertain to rheumatology literature, recognizing the challenges involved in the study of rare diseases, small populations, and complex outcome measures. Key aspects include:
 - 2.1.1. Levels of evidence
 - 2.1.2. Consensus building tools, including but not limited to guidelines
 - 2.2. Critically appraise retrieved evidence in order to address a clinical question
 - 2.3. Integrate critical appraisal conclusions into clinical care
- 3. Facilitate the education of patients and their families, as well as the education of students, residents, other health professionals, the public, and others, as appropriate
 - 3.1. Recognize the principles of learning relevant to medical education
 - 3.2. Collaboratively identify the learning needs and desired learning outcomes of others
 - 3.3. Select and demonstrate effective teaching strategies and content to facilitate the education of others
 - 3.4. Deliver effective lectures and presentations
 - 3.5. Assess and reflect on a teaching encounter, and incorporate change based on feedback
 - 3.6. Provide effective feedback
 - 3.7. Understand the principles of ethics with respect to teaching
- 4. Contribute to the development, dissemination, and translation of new knowledge and practices
 - 4.1. Understand and apply the principles of research and scholarly inquiry
 - 4.2. Apply the principles of research ethics
 - 4.3. Pose a scholarly question as it relates to the field of rheumatology
 - 4.4. Conduct a systemic search for evidence
 - 4.5. Select and apply appropriate methods to address the question
 - 4.6. Demonstrate awareness of the diversity of mechanisms available to appropriately disseminate the findings of a study, and apply one mode of dissemination
 - 4.7. Participate in a scholarly research, quality assurance, or educational project relevant to the field of rheumatology, demonstrating primary responsibility for at least one of the following elements of the project:
 - Development of the hypothesis, which must be based on a comprehensive literature review
 - Development of the protocol for the scholarly project
 - Preparation of a grant application
 - Development of the research ethics proposal
 - Interpretation and synthesis of the results

Role: Professional**Definition**

As Professionals, rheumatologists are committed to promoting the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behavior.

Key and enabling competencies

By the end of their training, the Rheumatology fellows are able to:

1. Demonstrate a commitment to their patients, profession, and society through ethical practice
 - 1.1. Exhibit appropriate professional behaviors in their practice, including honesty, integrity, commitment, compassion, respect and altruism
 - 1.2. Demonstrate a commitment to delivering the highest quality care and to maintaining competence
 - 1.3. Recognize and appropriately respond to ethical issues encountered in teaching, research, and clinical practice
 - Demonstrate consistent knowledge and application of the principles of medical ethics as they relate to patient care, including concepts of autonomy, beneficence, nonmaleficence, confidentiality, truth-telling, justice, respect for persons, conflict of interests, and resource allocation
 - Demonstrate consistent application of clinical research ethics as described in the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans; such concepts include conflict of interests, informed consent, and patient confidentiality
 - Demonstrate consistent application of ethical behavior in teaching, including patient confidentiality, teacher-learner relationship, and fairness of evaluation
 - 1.5. Identify, declare, and appropriately manage perceived, potential, and actual conflicts of interests
 - 1.6. Recognize the principles and limits of patient privacy and confidentiality, as defined by the law and by professional practice standards
 - 1.7. Maintain appropriate boundaries
2. Demonstrate a commitment to their patients, profession, and society through participation in profession-led regulation
 - 2.1. Adopt the CanMEDS framework of competencies in Rheumatology
 - 2.2. Demonstrate knowledge and understanding of professional, legal, and ethical codes of practice
 - 2.3. Fulfill the regulatory and legal obligations required of current practice
 - 2.4. Demonstrate accountability to professional regulatory bodies
 - 2.5. Demonstrate a willingness to accept peer and supervisor reviews of professional competence
 - 2.6. Demonstrate recognition of personal limitations of professional competence, as well as willingness to call upon others with special expertise
 - 2.7. Demonstrate flexibility and willingness to adjust to changing circumstances
 - 2.8. Recognize and respond appropriately to unprofessional behaviors of others in clinical practice
 - 2.9. Participate in peer review

3. Demonstrate a commitment to physician health and sustainable practice
 - 3.1. Balance personal and professional priorities to ensure personal health and a sustainable practice
 - 3.2. Strive to heighten personal and professional awareness and insight
 - 3.3. Recognize other professionals in need and respond appropriately

3. Continuum of Learning

This includes learning that should take place in each key stage of progression within the specialty. Trainees are reminded of the fact of life-long Continuous Professional Development (CPD). Trainees should keep in mind the necessity of CPD for every healthcare provider in order to meet the demand of their vital profession. The following table states how the role is progressively expected to develop throughout junior, senior and consultant levels of practice.

F1 (Junior Level)	F2 (Senior Level)	Consultant
Dependent/supervised practice	Dependent/supervised practice	Independent practice/provide supervision
Approaching Entrustable	Approaching Entrustable	Entrustable
Obtain fundamental knowledge related to core clinical problems of Rheumatology	Apply knowledge to provide appropriate clinical care related to core clinical problems of Rheumatology	Acquire advanced and up-to-date knowledge related to core clinical problems of Rheumatology
Apply clinical skills such as physical examination and practical procedures related to the core presenting problems and procedures of the specialty	Analyze and interpret the findings from clinical skills to develop appropriate differential diagnoses and management plan for the patient	Compare and evaluate challenging, contradictory findings and develop expanded differential diagnoses and management plan

4. Academic Activities:

General Principles

The inpatient and outpatient experience is the main training ground of the fellowship program. All trainees acquire experience in treating a wide range of musculoskeletal conditions, as the host centers handle different types of cases. Thus, the trainees will gain experience in the management of the entire range of rheumatological diseases.

The learning pathway in this fellowship program is continuous and employs different modes of teaching and learning, including interactive, didactic, and self-learning processes, depending on the type of service performed by the fellows at a given time. Teaching and learning activities are structured and programmatic, with a heavy focus on self-directed learning. Every week, 3–4 hours will be reserved for formal training. The Core Education Program (CEP) includes formal teaching and learning activities classified as universal topics, core specialty topics, and trainee-selected topics. At least 3 hours per week should be allocated to the CEP. The CEP will be supplemented by practice-based learning activities such as

- ✓ Morning reports or case presentations
- ✓ Morbidity and mortality reviews
- ✓ Journal clubs including systematic reviews
- ✓ Hospital grand rounds and other continuous medical education activities

Every 12 weeks, at least 30–60 minutes should be assigned to meeting with mentors to review the portfolio, perform a mini-clinical evaluation exercise, observe procedural skills directly, etc.

Assessment of academic activities

- Fellows will be asked to complete an evaluation form
- The evaluation forms will be reviewed generically by the Rheumatology Scientific Committee on an annual basis to inform changes in the curriculum activity contents
- Presenters of different academic activities will be evaluated by supervisory staff members to assist them in improving their presentation skills

Teaching and learning objectives arise from several teaching activities, which include the following:

1. Didactic centralized components of the curriculum (practice-based learning)

1.1. Weekly grand round (Appendix IX)

The grand round is an essential component of the training program. The round should be held in a weekly manner. The activity should take 3 to 4 hours and be divided in two parts. The first part of the round (1.1) should include presentation of patients admitted to the inpatient rheumatology department, as well as difficult or educational cases seen by the consultation team to be discussed thoroughly with the rheumatology staff in order to achieve optimal patient care; this first part of the round aims to maximize educational benefits, as well as to ensure that the trainees have fully achieved the CanMEDS framework competencies while managing the patients. The second part of the round (1.2) should include a topic presentation related to the patients discussed in previous rounds and to new advances in the field of rheumatology, including recent papers published in the relevant literature. Occasionally, guest speakers are invited to present a topic of interest. The guest speaker is always an experienced senior staff member, potentially from a different internal medicine discipline.

The objectives of the grand rounds are as follows:

- Increase the physicians' medical knowledge and skills, which ultimately translates into improving patient care
- Understand and apply current practice guidelines in the field of rheumatology
- Become aware of the latest advances and research in the field of rheumatology
- Identify and explain areas of controversy in the field of rheumatology

1.1.1. Case presentation

Case presentation is conducted weekly by an assigned resident (fellow), under the supervision of a senior fellow and in the presence of the attending consultant. The cases presented are those that involve interesting findings, unusual presentation, or difficult diagnosis or management.

The objectives of case presentation are as follows:

- Present a comprehensive rheumatic history and physical examination report, with details pertinent to the patient's specific problem

- Formulate a list of all relevant problems identified in the patient's history and during physical examination
- Develop an appropriate differential diagnosis for each problem
- Formulate a diagnosis and treatment plan for each problem
- Present a follow-up case in a focused, problem-based manner that includes pertinent new findings as well as diagnostic and treatment plans
- Demonstrate a commitment to improving case presentation skills by regularly seeking feedback regarding the presentations
- Record and present data accurately and objectively

1.1.2. Journal clubs, critical appraisal, and evidence-based medicine

The journal club meeting is conducted periodically every four weeks. The program director chooses a new article from a reputed journal and forwards it to one of the fellows at least 2 weeks prior to the scheduled meeting. The objectives of the journal club are as follows:

- Promoting continuing professional development
- Remaining abreast of current literature
- Disseminating information and promoting debate on good practices
- Ensuring that professional practice is evidence based
- Learning and practicing critical appraisal skills
- Providing an enjoyable educational and social environment

1.1.3. Joint specialty meetings (radiology, pathology, and other relevant fields)

Joint specialty meetings involving radiologists, pathologists, or other specialists are conducted once per four weeks and may include professionals from subspecialties such as gastroenterology and pulmonary medicine.

The objectives of the joint specialty meeting are as follows:

- Provide the knowledge, technical skills, and experience necessary for fellows to interpret and correlate pathological changes with clinical findings, laboratory data, and radiologic findings
- Promote effective communication and sharing of expertise with peers and colleagues
- Promote the development of investigative skills to improve the fellows' understanding of pathological processes in individual patients and in general patient populations
- Promote the acquisition of knowledge and provide support in laboratory direction and management, to encourage fellows to assume a leadership role in the education of other physicians and allied health professionals

1.1.4. Morbidity and mortality conferences

Mortality and morbidity conferences are conducted at least once every 12 weeks. The program director and department chairperson assign a trainee to prepare and present the cases to all department members, the attending consultant, and related staff. By law, the contents of the proceedings are to remain confidential.

The objectives of mortality and morbidity conferences are as follows:

- To identify areas of improvement for clinicians involved in case management, with the ultimate goal of improving patient care
- To prevent errors that lead to complications
- To modify behavior and judgment based on previous experience

1.1.5. Session for the practice of musculoskeletal physical examination and techniques of joint aspiration and injection

Fellows of all levels should be able to perform all types of musculoskeletal physical examinations and rheumatology treatment procedures (typically, joint aspirations and injections) with full confidence. A weekly one-hour session should be reserved for the fellow to perform a pre-arranged set of joint examinations and related techniques, under the supervision of a consultant.

The objectives of the session for the practice of musculoskeletal physical examination techniques for joint aspiration and injection are as follows:

- To familiarize fellows with skills required for adequate physical examination of joints
- To help the fellows master a quick musculoskeletal screening examination in a busy practice
- To allow the fellows to train with performing diagnostic and therapeutic joint procedures (aspirations and injections)
- To make the fellows aware of the difficulties associated with each procedure, as well as of how to overcome such difficulties

1.2. Daily morning meetings (Appendix IX)

Rheumatology Fellowship Trainees, and especially fellows who are on call, are required to attend the morning meeting on General Internal Medicine. It is not uncommon for a rheumatology case to be discussed during such meetings. Thus, the fellow will be able to participate in the case management, as well as contribute to the education of attending medical staff.

The morning report is a universal component of internal medicine training. Though there is a wide variation in format, attendance, and timing, all residents share the common goal of case presentation for the purposes of educating resident physicians, monitoring patient care, and reviewing management decisions and their outcomes. The morning report is conducted from Sunday to Thursday and lasts 45–60 min. The team that have been on call the previous night briefly present and discuss all admitted patients with the audience, with an emphasis on history, clinical findings, differential diagnoses, acute management, and future plans. The chief resident or morning report moderator decides the format or theme of the meeting. The meeting should include discussion of short and long cases, data interpretation, and a topic presentation lasting 5 min.

The objectives of the morning meetings are as follows:

- To educate all attending residents, monitor patient care, and review management decisions and their outcomes
- To develop the fellows' competence with the concise presentation of relevant details regarding admitted patients with rheumatic diseases, in a scientific and informative fashion
- To help the fellows learn and gain confidence in discussing rheumatology-related issues, especially when presenting long cases in a systematic fashion
- To assist the fellows in developing appropriate differential diagnoses and suitable management plans in relation to rheumatic diseases
- To allow the fellows to practice giving a very brief topic presentation on rheumatic diseases of interest

1.3. Half-day educational activity (HDEA)

The Rheumatology fellowship HDEA is organized directly by the Rheumatology Scientific Committee. The HDEA is a mandatory activity during which all fellows will be released from their clinical duties including elective and selective rotations. This activity is centered on topics and skills that are vital for training the fellows to master their basic and clinical knowledge. The HDEA is held twice a month at a specific location and time (e.g., every other Monday of every month, from 1 to 5 PM). Members of the scientific committee organize the schedule and approve the content of the HDEAs (Appendix XI).

Objectives

- To identify the most common rheumatological diseases and approaches
- To enable trainees to acquire up-to-date knowledge, exchange information, and share their experience with colleagues and trainers
- To incorporate the rheumatological approach into clinical problem management
- To acquire skills important for the rheumatologist (e.g., problem solving, team work, counselling skills, negotiation skills, presentation skills)
- To alleviate the fellows' stress and allow them to socialize with their colleagues of various levels

Guidelines

- Main theme presentations (60–80% of the sessions) given by consultants with vast experience. These themes should be presented in line with the problem-solving approach used in rheumatology, with evidence-based information whenever possible.
- To maximize the benefit of these sessions, trainees must contribute actively to the session.
- Open activity: Allow one or two HDEA sessions per year to consist of free activities during which both trainees and trainers gather socially to share experience and knowledge in a low-stress environment
- Elective sessions: Allow some HDEA sessions to be planned according to the specific needs of the trainees. Such sessions aim to improve certain skills of fellows in an enjoyable way.
- HDEA content should be planned in full conformance with the curriculum requirements and in consideration of the 2-year duration of the program, to ensure that learning needs are accommodated. Feedback from previous and current HDEA cycles should be taken into account.

Regulations

The HDEA is a mandatory component of the fellowship program, meant to complement the clinical experience that fellows gain during their clinical work. Substantial effort should be spent into making the HDEA sessions interesting and relevant.

- For each session, there will be one trainer responsible for conducting and organizing the whole session.
- The entire group should contribute to preparing the session and participate actively during the HDEA.
- Details regarding the HDEA schedule throughout the entire year should be made available no later than at the beginning of the academic year

- Educational activities should include different educational methods and strategies, but passive teaching approaches such as lecturing should be avoided. Useful methods include, but are not restricted to, the following: problem solving, case discussion, interactive mini lectures, group discussion, role play, tutorials, workshops, and assignments.
- In all educational sessions, emphasis should be placed on important issues of ethics, evidence-based medicine, practice management, disease prevention, health promotion, proper communication skills, and professionalism. It is important to adhere to the training program mission and the provisions listed in the SCFHS manual.

Trainee attendance

- Attendance should be recorded, and a copy of the attendance record will be kept for report and documentation.
- Each trainee expects to attend most of HDEA sessions. In the first three months of the academic year, trainees with poor attendance shall receive a reminder or warning letter for unjustified absences. Trainees who continue to show poor attendance with no acceptable reason will be sent a second warning letter. Further action will be taken in this regard according to the SCFHS rules and regulations.

Rheumatology fellowship HDEA blueprint**I. Topic reviews**

Topic reviews are lecture series concerning systematic approaches to treat common rheumatic conditions. These lecture series are repeated annually. The objectives of the topic reviews are as follows:

- Illustrate diagnostic and therapeutic skills
- Provide access to relevant information that can be applied directly in clinical practice
- Promote the practice contemporary, evidence-based, and cost-effective medicine
- Warn against unnecessary or harmful investigations or therapeutic procedures

II. Clinical skills

During the HDEA sessions, clinical skills will typically be practiced in the form of simulations in small groups. This includes taking history and conducting physical examinations. However, lectures and video demonstrations can be added to academic HDEAs prior to the simulation exercise.

The objectives of the clinical skills session are as follows:

- Help the trainees master basic physical examination skills and become able to perform focused examinations and interpret the findings
- Encourage the trainees to exhibit professional behavior such as demonstrating respect for patients, colleagues, faculty members, and others in all settings

III. Communication skills

The competencies deemed essential for fellows to serve as communicators help establish rapport and trust, formulate a diagnosis, deliver information, achieve mutual understanding, and facilitate the development of a shared care plan. Poor communication can lead to undesirable results; thus, effective communication is critical for optimal patient outcomes. Physicians should employ patient-centered communication regarding the therapeutic plan and the decision making process, as well as to promote effective dynamic interactions with patients, families, caregivers, fellow professionals, and other important individuals. During the HDEA sessions, communication skills lectures concerning common situations are

regularly delivered by experienced staff members. Such lecture sessions are repeated annually.

The objectives of the communication skills session are to help the trainees:

- Develop patient-centered communication through shared decision-making and effective dynamic interactions with patients, families, other professionals, and other important individuals
- Counsel and educate patients and their family on the role of early diagnosis and prophylaxis
- Master skills of basic interviewing and demonstrate competence in some advanced interviewing skills
- Exhibit professional behavior, including demonstrating respect for patients, colleagues, faculty, and others in all settings
- Apply ethical knowledge in clinical care
- Understand the process of informed healthcare decision making

IV. Medical ethics

Ethical issues are frequently encountered during clinical practice, and discussing medico-legal aspects of care with experts is of paramount importance for better and safer training and practice. A senior staff member will raise a particular medico-legal issue to be discussed interactively with fellows during the HDEAs.

The objectives of this activity are to help the trainees:

- Recognize the humanistic and ethical aspects of a career in rheumatology
- Examine and affirm personal, professional, and moral commitments
- Establish a foundation of philosophical, social, and legal knowledge
- Gain skills to apply insight, knowledge, and reasoning to clinical care

V. Research and evidence-based practice

The SCFHS promotes and supports research conducted by trainees. Therefore, fellows are expected to participate in annual research projects. The presentation and dissemination of the work produced occurs during formal fellow research days held annually at various centers. These projects are not necessarily required to result in publications in impacted journals or in presentations at national or international conferences. However, fellows with outstanding projects that have resulted in publishable results are supported and mentored in this direction. The objectives of the research aspect of the Rheumatology fellowship program are to help fellows:

- Become familiar with the generation and dissemination of research via oral presentations, poster presentations, and abstract preparation; attend core academic teaching sessions applicable to research, including ethics, study design, abstract writing, and presentation skills
- Gain competence in conducting literature reviews and data synthesis, analysis, and interpretation

2. Rotational (work-based) components of the curriculum

2.1. Daily round-based learning

2.1.1. Inpatient service

Fellows assigned to the inpatient service are responsible for patients admitted to the rheumatology department. The fellows are in charge of elective admissions such as the admission of patients with systemic lupus

erythematous (SLE) having proteinuria for renal biopsy. Fellows in the general rheumatology rotation should be solely responsible for rheumatology patients admitted through the emergency room to a general department (e.g., patients with active rheumatoid arthritis. However, if the admission is to the intensive care unit (e.g., SLE patients with pulmonary hemorrhage), the fellow will be the leading physician in the intensive care unit treating team, giving expert advice and performing daily rounds as needed. The duties of junior and senior fellows involve daily rounds with residents from other departments and with interns, under the supervision of a rheumatology consultant. However, the level of independence in the daily rounds (performed under the consultant's supervision) is proportional to the fellow's level of training (junior vs. senior). Fellows are expected to participate in the education of patients and health care staff. Fellows should perform bedside teaching activities and discuss common rheumatic diseases with other health care staff at least three times weekly. If needed, fellows may perform diagnostic or therapeutic procedures in the field of rheumatology, under the consultant's supervision.

The objectives of inpatient service rounds are as follows:

- Assessment of the medical history and physical examination findings
- Generating differential diagnoses
- Reviewing admission notes, discharge summaries, and medical reports
- Developing evidence-based treatment plans
- Interpreting laboratory investigation results (e.g., from imaging, echocardiography, and blood tests)
- Consulting with professionals of other disciplines
- Communicating, including discussing risk factors and prevention, with patients and their families
- Patient discharge and follow-up planning

2.1.2. Day care service (short stay unit)

Many rheumatology services are provided in the short stay unit. Patients scheduled to the day care will be admitted to receive infusions of multiple biologic agents such as rituximab and infliximab, immunosuppressive agents such as cyclophosphamide, and osteoporosis treatment agents such as zoledronic acid and pamidronate. Occasionally, patients will be admitted to the short stay unit to undergo simple procedures that do not require admission to the general ward, such as for planning renal biopsy in patients with lupus nephritis. Fellows must be aware that adding day care service to their responsibilities during the general rheumatology rotation represents an important part of training. Fellows assigned to day care service will increase their experience with performing procedures and handling complications of the procedures or reactions to medications, should they occur. The fellows are expected to evaluate the admitted patients before proceeding with the treatment plan.

The objectives of day care rounds are as follows:

- Assess the disease activity status and treatment response of the patient visiting the unit

- Learn the common indications and mode of administration for anti-rheumatic medications commonly given in the short stay unit, as well as how to anticipate and manage common complications associated with these medications
- Elicit clinical signs for residents

2.2. On-call duty-based learning: consultation service

Fellows on-call for consultation service will be responsible for receiving and following up consults from all around the hospital, which includes the emergency, intensive care unit, obstetrics and gynecology, surgery, and internal medicine departments, as well as from the clinical teaching unit, during the working hours and overnight, including the weekends. On-call fellows are expected to help in the approach of patients who require an expert opinion from a rheumatologist, as well as to perform the necessary procedures if needed, under the supervision of the on-call rheumatology consultant. The fellows are expected to be on call for a maximum of 14 days per month, including weekends.

The objectives of consultation service are as follows:

- Supervise and discuss the implementation of proposed management plans
- Supervise residents' skills in taking history and conducting physical examinations
- Assist residents in interpreting the results of laboratory investigations and in performing bedside diagnostic and therapeutic procedures
- Perform a proper weekend round to see all inpatients

2.3. Clinic-based learning: outpatient service

The outpatient service constitutes the core of rheumatology practice. The outpatient clinic handles a variety of cases, ranging from simple, to difficult, to highly complicated. The fellows will take part in the entire process, starting with new referrals to the rheumatology service, taking full history, performing physical examination, ordering the necessary investigations (laboratory or radiological investigations), establishing diagnosis, and initiating treatment. Moreover, the fellows will be able to plan the future clinic visits of patients with rheumatological diseases, assess the activity of the disease, evaluate treatment response, monitoring for complications, and take appropriate action should such occur. Since rheumatology is a demanding outpatient service requiring substantial effort to build up clinical knowledge and skills, off-call fellows are expected to be heavily involved in the clinics. The fellow performs all activities under the supervision of certified rheumatology consultants who provide teaching and supervision. Junior fellows must attend 16–18 clinics/month, while senior fellows, who are more independent and experienced, need not attend more than 18–20 clinics/month, including clinics run by senior fellows or so-called nursing clinics with continuous support from a consultant.

Consultants in the host clinics should provide the fellows with full support, supervision, and training. Training activities with the consultants are vital to the fellowship program, and failure to help fellows improve their education may lead future fellows to avoid joining clinics that provide only service-based participation.

The objectives of outpatient service are as follows:

- Conduct patient follow-up under the supervision of the attending consultant

- Discuss management plans, including investigations, treatment, and referral to other departments, with the consultant
- Discuss the need for specialized procedures with the consultant
- Elicit clinical signs for residents
- Interpret and discuss laboratory results with other fellows
- Assess the performance of fellows in terms of communication skills, focused history taking, and physical examination

5. Universal Topics

1. The core topics for the post-graduate curriculum will be developed centrally by the SCFHS and delivered through an e-learning platform: (<https://www.scfhs.org.sa/en/MESPS/Pages/UniversalTopics.aspx>) .
2. A set of preliminary learning outcomes for each topic will be developed. Content experts, in collaboration with the central team, may modify the learning outcomes. These topics will be didactic in nature, with a focus on the practical aspects of care. These topics will be more content-heavy than the workshops and other face-to-face interactive session planned as part of this curriculum. The duration of each topic is to be decided by the training committee of the program as needed.
3. The topics will be delivered in a modular fashion. At the end of each learning unit, online formative assessment will be conducted. After completion of all topics, there will be a combined summative assessment in the form of context-rich multiple-choice questions (MCQs). All trainees must attain minimum competency in the summative assessment. Alternatively, a summative assessment of competency in these topics can be performed together with specialty examinations.

Module 1 - Introduction

- Safe drug prescribing
- Hospital-Acquired Infections (HAIs)
- Sepsis, Systemic Inflammatory Response Syndrome (SIRS), Disseminated Intravascular Coagulation (DIC)
- Antibiotic Stewardship
- Blood Transfusion

2.3.1.1. **Safe Drug Prescribing:** At the end of this Learning Unit, the fellow should be able to:

- 2.3.1.1.1. Recognize the importance of safe drug prescribing in healthcare
- 2.3.1.1.2. Describe various adverse drug reactions, providing examples of commonly prescribed drugs that can cause such reactions
- 2.3.1.1.3. Apply principles of drug-drug interactions, drug-disease interactions, and drug-food interactions in common situations
- 2.3.1.1.4. Adequately employ the principles of prescribing drugs in special populations (e.g., patients with renal or liver failure)

- 2.3.1.1.5. Correctly apply the principles of prescribing drugs in elderly patients, pediatric patients, and in pregnant or lactating women
- 2.3.1.1.6. Promote evidence-based, cost-effective prescribing
- 2.3.1.1.7. Discuss the ethical and legal framework governing safe drug prescribing in Saudi Arabia
- 2.3.1.2. **Hospital Acquired Infections (HAIs):** At the end of this Learning Unit, the fellow should be able to:
 - 2.3.1.2.1. Discuss the epidemiology of HAIs, with special focus on HAIs in Saudi Arabia
 - 2.3.1.2.2. Recognize HAI as one of the major emerging threats in healthcare
 - 2.3.1.2.3. Identify the common sources and settings of HAIs
 - 2.3.1.2.4. Describe the risk factors of common HAIs such as ventilator-associated pneumonia, methicillin-resistant *Staphylococcus aureus* (MRSA) infection, central line-associated blood stream infection (CLABSI), vancomycin-resistant *Enterococcus* (VRE) infection
 - 2.3.1.2.5. Identify the role of healthcare workers in the prevention of HAI
 - 2.3.1.2.6. Determine appropriate pharmacological (e.g., use of selected antibiotics) and non-pharmacological (e.g., removal of indwelling catheter) measures in the treatment of HAI
 - 2.3.1.2.7. Propose a plan to prevent HAI in the workplace
- 2.3.1.3. **Sepsis, Systemic Inflammatory Response Syndrome (SIRS), Disseminated Intravascular Coagulation (DIC):** At the end of this Learning Unit, the fellow should be able to:
 - 2.3.1.3.1. Explain the pathogenesis of sepsis, SIRS, and DIC
 - 2.3.1.3.2. Identify patient-related and non-patient related predisposing factors of sepsis, SIRS, and DIC
 - 2.3.1.3.3. Recognize a patient at risk of developing sepsis, SIRS, or DIC
 - 2.3.1.3.4. Describe the complications of sepsis, SIRS, and DIC
 - 2.3.1.3.5. Correctly apply the principles of management of patients with sepsis, SIRS, or DIC
 - 2.3.1.3.6. Describe the prognosis of sepsis, SIRS, and DIC
- 2.3.1.4. **Antibiotic Stewardship:** At the end of this Learning Unit, the fellow should be able to:
 - 2.3.1.4.1. Recognize antibiotic resistance as one of the most pressing public health threats globally
 - 2.3.1.4.2. Describe the mechanism of antibiotic resistance
 - 2.3.1.4.3. Determine the appropriate and inappropriate use of antibiotics
 - 2.3.1.4.4. Develop a plan for safe and proper antibiotic usage, including correct indication, duration, type of antibiotic, and discontinuation.
 - 2.3.1.4.5. Appraise of the local guidelines in the prevention of antibiotic resistance

- 2.3.1.5. **Blood Transfusion:** At the end of this Learning Unit, the fellow should be able to:
- 2.3.1.5.1. Review the different components of blood products available for transfusion
 - 2.3.1.5.2. Recognize the indications and contraindications of blood product transfusion
 - 2.3.1.5.3. Discuss the benefits, risks, and alternatives to transfusion
 - 2.3.1.5.4. Obtain consent for specific blood product transfusion
 - 2.3.1.5.5. Perform steps necessary for safe transfusion
 - 2.3.1.5.6. Develop an understanding of special precautions and procedures necessary during massive transfusions
 - 2.3.1.5.7. Recognize transfusion-associated reactions and undertake immediate and appropriate action

Module 2 - Diabetes and Metabolic Disorders

- Management of Diabetic Complications
- Comorbidities of Obesity

- 2.3.1.6. **Management of Diabetic Complications:** At the end of this Learning Unit, the fellow should be able to:
- 2.3.1.6.1. Describe the pathogenesis of important complications of type 2 diabetes mellitus
 - 2.3.1.6.2. Screen patients for such complications
 - 2.3.1.6.3. Establish and promote preventive measures for such complications
 - 2.3.1.6.4. Treat such complications
 - 2.3.1.6.5. Counsel patients and families with special emphasis on prevention
- 2.3.1.7. **Comorbidities of Obesity:** At the end of this Learning Unit, the fellow should be able to:
- 2.3.1.7.1. Screen patients for presence of common and important comorbidities of obesity
 - 2.3.1.7.2. Manage obesity-related comorbidities
 - 2.3.1.7.3. Provide dietary and life-style advice for prevention and management of obesity

Module 3 - Acute Care

- Acute Pain Management
- Chronic Pain Management

- 2.3.1.8. **Acute Pain Management:** At the end of this Learning Unit, the fellow should be able to:
- 2.3.1.8.1. Review the physiological basis of pain perception
 - 2.3.1.8.2. Proactively identify patients who might be in acute pain
 - 2.3.1.8.3. Evaluate patients with acute pain

- 2.3.1.8.4. Apply various pharmacological and non-pharmacological modalities for the management of acute pain
- 2.3.1.8.5. Provide adequate pain relief for uncomplicated patients with acute pain
- 2.3.1.8.6. Identify and refer patients with acute pain who may benefit from specialized pain services
- 2.3.1.9. **Chronic Pain Management:** At the end of this Learning Unit, the fellow should be able to:
 - 2.3.1.9.1. Review the bio-psychosocial and physiological basis of chronic pain perception
 - 2.3.1.9.2. Discuss various pharmacological and non-pharmacological options available for chronic pain management
 - 2.3.1.9.3. Provide adequate pain relief for uncomplicated patients with chronic pain
 - 2.3.1.9.4. Identify and refer patients with chronic pain who may benefit from specialized pain services

Module 4 - Frail Elderly

- Prescribing Drugs in the Elderly
- Care of the Elderly

- 2.3.1.10. **Prescribing Drugs in the Elderly:** At the end of this Learning Unit, the fellow should be able to:
 - 2.3.1.10.1. Discuss the principles of prescribing in the elderly
 - 2.3.1.10.2. Recognize poly-pharmacy, prescribing cascade, inappropriate dosage, use of inappropriate drugs, and deliberate drug exclusion as major causes of morbidity in the elderly
 - 2.3.1.10.3. Describe the physiological and functional declines in the elderly that contribute to increased drug-related adverse events
 - 2.3.1.10.4. Discuss drug-drug interactions and drug-disease interactions among the elderly
 - 2.3.1.10.5. Be familiar with the Beers criteria
 - 2.3.1.10.6. Develop rational prescribing habits for the elderly
 - 2.3.1.10.7. Counsel elderly patients and their families on the safe usage of medication
- 2.3.1.11. **Care of the Elderly:** At the end of this Learning Unit, the fellow should be able to:
 - 2.3.1.11.1. Describe the factors that need to be considered while planning care for the elderly
 - 2.3.1.11.2. Recognize the needs and well-being of care-givers
 - 2.3.1.11.3. Identify the local and community resources available in the care of the elderly
 - 2.3.1.11.4. Develop, with inputs from other health care professionals, individualized care plans for elderly patients

6. Core Rheumatology Topics

1. The format of core specialty topics is encouraged to be in interactive, case-based discussion format with pre-learning materials.
2. Whenever applicable, core specialty topics should include workshops, team-based learning (TBL) and simulation to develop skills in core procedures.
3. Regional supervisory committees in coordination with academic and training affairs, program directors, and chief fellow should work together to ensure planning and implementation of academic activities as indicated in the curriculum.
4. There should be an active involvement of the trainee in the development and delivery of the topics under faculty supervision; the involvement might be in the form of: delivery, content development, research....etc.

6.1. Knowledge

Topics	Learning objectives
Rheumatoid arthritis	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, and clinical expression (including clinical subtypes) 2. Identify the wide variety of medication used to control the disease 3. Recognize the different concomitant comorbidities and the special management strategies appropriate in such cases
Systemic lupus erythematosus: systemic, discoid, and drug-related	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and pathology 2. Recognize the presentation of lupus nephritis and the different management guidelines suitable for each disease class 3. Become acquainted with the management of severe complications of the disease
Anti-phospholipid antibody syndrome	1. Acquire knowledge of the diagnosis criteria, complications, management 2. Recognize catastrophic anti-phospholipid syndrome presentation and become acquainted with suitable management strategies

Systemic sclerosis (and mimickers)	1. Acquire knowledge of the epidemiology, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and pathology 2. Recognize the disease mimickers and learn about the adequate management strategy
Inflammatory muscle disease: polymyositis, dermatomyositis, malignancy-associated myositis, juvenile dermatomyositis, sporadic inclusion body myositis, myositis associated with other connective tissue diseases (CTDs)	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and pathology 2. Recognize frequent malignancy-associated forms and learn how to screen for such conditions
Other CTDs: mixed CTDs, overlap syndromes, undifferentiated CTD	1. Recognize the patterns of different CTDs 2. Know how to screen for complications associated with CTDs
Axial spondyloarthritis: ankylosing spondylitis, psoriatic arthritis, arthritis associated with, reactive arthritis	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and management 2. Recognize the frequent complications associated with these diseases, and learn about the adequate management strategies
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 associated with systemic disorders, infections, drugs, malignancies; polyangiitis overlap syndrome combined with necrotizing vasculitis	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and pathology 2. Be familiar with the detailed management strategies for such diseases 3. Know how to screen for complications of such diseases or associated with the treatment of the diseases, as well as how to manage the complications

Infectious arthritides: bacterial (non-gonococcal and gonococcal), mycobacterial, viral (HIV, hepatitis B virus, hepatitis C virus, parvovirus, chikungunya virus, dengue), fungal, parasitic, Whipple's disease	1. Recognize the common infectious arthritides in Saudi Arabia, as well as their presentations 2. Be familiar with the antimicrobial agents used to treat such disease
Other arthritides: acute rheumatic fever, arthritis associated with subacute bacterial endocarditis, intestinal bypass arthritis, post-dysenteric arthritides, post-immunization arthritis, other colitis-associated arthropathies	1. Acquire knowledge of the epidemiology, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes) 2. Identify the appropriate management strategy for these diseases
Crystal-associated diseases: monosodium urate monohydrate deposition (gout), calcium pyrophosphate dihydrate deposition disease, basic calcium phosphate (hydroxyapatite) deposition, calcium oxalate deposition	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and microscopic appearance. 2. Understand the detailed management of such conditions in the acute setting and in the ambulatory setting
Rheumatic syndromes associated with endocrine diseases (diabetes mellitus, acromegaly, parathyroid disease, thyroid disease, Cushing disease)	1. Recognize common rheumatic manifestations of endocrine diseases 2. Identify the diagnostic methods and management strategies for such conditions
Rheumatic syndromes associated with hematological diseases (hemophilia, hemoglobinopathies, angioimmunoblastic lymphadenopathy or lymphoma, multiple myeloma, hemophagocytic lymphohistiocytosis, macrophage activation syndrome)	1. Recognize common rheumatic manifestations of hematological diseases 2. Identify the diagnostic methods and management strategies for such conditions
Rheumatic diseases in patients with renal diseases (conditions requiring dialysis, chronic kidney disease, renal osteodystrophy)	1. Recognize common rheumatic diseases associated with renal dysfunction 2. Identify the diagnostic methods and management strategies for such conditions

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. Other: transient osteoporosis, hypertrophic osteoarthropathy, diffuse idiopathic skeletal hyperostosis	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical subtypes, and prognosis 2. Identify the appropriate management strategy for such diseases
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 the 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, other g. Autoinflammatory syndromes: familial Mediterranean fever, hyperimmunoglobulinemia D syndrome, tumor necrosis factor receptor-associated periodic syndromes (TRAPS); periodic fever, aphthous stomatitis, pharyngitis, cervical adenitis (PFAPA) syndrome, Blau syndrome, Schnitzler syndrome, systemic juvenile idiopathic arthritis (SJIA), and cryopyrin-associated periodic syndrome (CAPS) including Muckle-Wells syndrome and familial cold autoinflammatory syndrome	1. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and prognosis 2. Identify the appropriate management strategies

h. Other: hemochromatosis, hyperlipidemic arthropathy, myositis ossificans progressiva, Wilson's disease, other	
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., in the shoulder: shoulder-rotator cuff tear, subacromial bursitis, adhesive capsulitis, impingement syndrome; in the wrist: ganglion cysts, De Quervain's tenosynovitis, trigger fingers (stenosing tenosynovitis), Dupuytren's contractures; in the knee: synovial plica syndrome, internal derangements, popliteal cyst; in the foot/ankle: plantar fasciitis, Achilles tendinitis, Morton's neuroma; in other joints: temporomandibular joint syndromes, costochondritis) e. Biomechanical/anatomic abnormalities associated with regional pain syndromes: scoliosis, kyphosis, genu valgum, genu varum, leg length discrepancy, foot deformities f. Rheumatic syndromes associated with overuse injury (occupational, sports, recreational, performing arts) g. Issues forming the object of sports medicine (injuries, strains, sprains, nutrition, medication issues) h. Entrapment neuropathies: thoracic outlet syndrome, upper extremity entrapments, lower extremity entrapments	1. Recognize the presentation of non-articular and regional musculoskeletal disorders 2. Identify the pharmacological and non-pharmacological treatments for these disorders

i. Other: peripheral neuropathies (polyneuropathy, small fiber neuropathy), mononeuritis multiplex, complex regional pain syndrome (formerly, reflex sympathetic dystrophy), erythromelalgia	
Pediatric rheumatic diseases	1. Recognize the common pediatric rheumatological disease 2. Acquire knowledge of the epidemiology, genetics, disease pathogenesis, natural history, diagnosis, clinical expression (including clinical subtypes), and management options
Miscellaneous rheumatological diseases: Raynaud's phenomenon, rheumatic manifestation in sarcoidosis	1. Recognize the diverse rheumatological manifestations associated with various comorbidities, and know the suitable management approach
Rheumatic diseases during pregnancy	1. Assess the disease activity status of various rheumatological diseases that occur during pregnancy 2. Recognize the safety profile of various pharmacological agents
Radiological and imaging modalities: plain radiographs, computed tomography, magnetic resonance imaging, ultrasound, nuclear imaging	1. Recognize the different radiological modalities needed in rheumatology 2. Understand the basics of principles of these modalities and how to interpret the findings
Laboratory evaluation: autoimmune and serologic workup	1. Understand the methods used for performing the autoimmune and serologic workup 2. Recognize the microscopic patterns when staining for different autoantibodies 3. Recognize the microscopic patterns of crystals deposition in joints
Rehabilitation modalities: physical therapy, occupational therapy, orthotics	1. Recognize the different rehabilitation modalities used in rheumatology 2. Understand the indication and contraindication of such modalities in rheumatological patients
Research rotation (see also Appendix VII)	1. Know the principles and clinical implications of epidemiology and evidence-based medicine 2. Extrapolate results from research and apply them to clinical practice 3. Know the fundamentals of research types and research methodology

	4. Write a research proposal for medical research 5. Plan and execute the planned medical research 6. Critically evaluate research
Therapeutics in rheumatology A. NSAIDs B. Glucocorticoids, systemic and injectable C. Conventional DMARDs D. Biologic DMARDs (TNFi, non-TNFi, small molecule agents) E. Bone strengthening agents F. Hypouricemic agents	1. Recognize the various pharmacological agents used in rheumatology, including their mechanism of action, efficacy, safety, and associated complications
Elective rotation	1. Enrich an area of interest not covered in depth during core training. 2. Special interest areas related to Rheumatology include: 3. Pregnancy and rheumatic disease 4. Quality improvement 5. Geriatric care 6. Home care and occupational medicine 7. Sports medicine 8. Physical medicine 9. Other

6.2. Skill

Procedures List

Procedures list is divided into two categories (see Assessment system log book for procedures list):

1. Category I: Foundational Core Specialty Procedures

These are the specialty foundational procedures that are required to be learned and practiced under supervision during the training. Expected completion for Category I procedures should be during junior level of training.

2. Category II: Mastery level procedures

These are core specialty procedures that trainees are expected to be competent performing unsupervised at the end of training.

For Category I and II procedures:

- a. assessment system log book describe the List of procedures observed/participated, performed under supervision, and those certified by the supervisor to be performed with full competency.
- b. Each trainee needs to maintain a logbook documenting the procedures observed, performed under supervision, and performed independently.
- c. The minimum number of procedures (Three different procedures every 4-week block) to be performed before certified being competent and the minimum number of five for common procedures needed to maintain competency.

- d. Trainees need to declare that he/she is competent in Category I&II procedures. If for any reason, a trainee is not competent in any given Category I&II procedures he/she should be provided with extended supervised training.

6.3. Attitude

List of Behavioral/Communication Skills

This could be categorized into two:

- a) Category I: Assumed or Universal
Category I includes previously learned behavioral and communication skills and skills that are universal in nature (e.g. breaking bad news; consent taking for renal biopsy).
- b) Category II: Core specialty
Category II includes Rheumatology specific behavioral and communication skills (e.g. informed consent for cytotoxic medication i.e. cyclophosphamide, intraarticular procedure, handling pregnancy in rheumatic disease issues).

7. Trainee selected topics

These topics will be selected by the fellows in order to enhance their learning experience and should be presented using hands-on and interactive sessions. Examples of adequate topics include:

- Immunology review: basics and clinically oriented analysis
- Radiological modalities in rheumatology: how to interpret radiologic findings
- Ultrasonography in rheumatology: using ultrasound to evaluate normal and diseased joints and to guide intraarticular injections
- Sports medicine injuries as presentations of musculoskeletal complaints
- Muscle, skin, and lip biopsy technique in the outpatient setting
- Occupational and physiotherapy for rheumatic diseases
- Causes of joint pain other than inflammatory arthritis: neurology and physical medicine perspectives
- Women's health and rheumatic diseases

8. Workshops and courses

Workshop / course	Description
1. Introduction to Clinical Research	• Duration, 2 to 3 days • Emphasis on the basics of clinical research
2. Musculoskeletal Ultrasound 2.1. The Basics of Musculoskeletal Ultrasound 2.2. Advanced Musculoskeletal Ultrasound	• Duration, 1 to 2 days • Identify uses of ultrasound in the management of rheumatological diseases • Hand-on training on normal and diseased joints • Ultrasound-guided joint injections, joint aspirations

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3. Basic Joint Injection Workshop	• Full-day course • Hands-on training on joint injection (blind and ultrasound-guided) and aspiration
4. Evidence-Based Medicine Course	• Full-day course • Focused on the fundamentals of evidence-based medicine
5. Rheumatology Board Review Course	• Duration, 2 days • Preparation for the Rheumatology exams: MCQs, hands-on physical examinations
6. Musculoskeletal Ultrasound Certification in Rheumatology (RhMSUS)	• Online course by the American College of Rheumatology • Successful completion requires passing a final examination and is awarded with RhMSUS certification.

ASSESSMENT OF LEARNING

1. Purpose of Assessment

Assessment plays a vital role in the success of postgraduate training. Assessment will guide trainees and trainers to achieve the targeted learning objectives. On the other hand, reliable and valid assessment will provide excellent means for training improvement as it will inform the following aspects: curriculum development, teaching methods, and quality of learning environment. The SRFTP has adopted multiple validated mechanisms for assessing and evaluating the trainees. The assessment process is meticulous and standardized, to ensure that, by the time they graduate, the trainees are equipped with adequate knowledge, skills, ethical principles, education, and conduct. Assessment can serve the following purposes:

Purpose of continuous assessment and evaluation in the SRFTP

- a. Improving learning skills
- b. Optimizing the qualities of the trainees
- c. Early detection of any difficulties the trainees may have, so that such difficulties may be corrected
- d. Evaluation of the training program and of the faculty staff involved
- e. Ensuring the full commitment of the faculty staff and of the trainee to the specialty
- f. Deciding whether or not the trainee may proceed to the next level of training and may apply for the final board examination

For the sake of organization, assessment will be further classified into two main categories: Formative and Summative.

2. Formative Assessment

2.1 General Principles

Trainees, as an adult learner, should strive for feedback throughout their journey of competency from “novice” to “mastery” levels. *Formative assessment* (also referred to as continuous assessment) is the component of assessment that is distributed throughout the academic year aiming primarily to provide trainees with effective feedback. Input from the overall formative assessment tools will be utilized at the end of the year to make the decision of promoting each individual trainee from current-to-subsequent training level. Formative assessment will be defined based on the scientific (council/committee) recommendations (usually updated and announced for each individual program at the start of the academic year). According to the executive policy on continuous assessment (available online: www.scfhs.org), formative assessment will have the following features:

- a. Multisource: minimum four tools.
- b. Comprehensive: covering all learning domains (knowledge, skills, and attitude).
- c. Relevant: focusing on workplace-based observations.
- d. Competency-milestone oriented: reflecting trainee's expected competencies that matches trainee's developmental level.

Trainees should play an active role seeking feedback during their training. On the other hand, trainers are expected to provide timely and formative assessment. SCFHS will provide an e-portfolio system to enhance communication and analysis of data arising from formative assessment.

Formative continuous evaluation throughout the first and second year

To check whether the CanMEDS competencies are met, the fellows' performance will be evaluated the end of each rotation. The evaluation will be performed jointly by relevant staff members, who assess the following competencies:

- Performance of the trainee in routine medical activities
- Performance regarding participation in academic activities
- Performance during a 10–15-min period of direct observation for the purpose of assessment, during which the trainee is interacting with a patient. Trainers are required to perform at least three such assessments per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the fellows after each assessment of the trainee-patient encounter, framed according to the Mini Clinical Evaluation Exercise (mini-CEX) form (Appendix II) and the Case-Based Discussion (CBD) form (Appendix VII).
- Skill of the trainee when performing diagnostic and therapeutic procedures. Timely and specific feedback should be provided by the trainer to the trainee following each procedure, framed according to the Direct Observation of Procedural Skills (DOPS) form (Appendix III).
- The Mini-CEX, CBD, and DOPS results are collected every three months in a dedicated form filled in by the mentors (Appendix IV).
- CanMEDS-based competencies for each role are evaluated by means of the ITER (Appendix V) form, which must bear the signatures of at least two consultants and be submitted to the program director no later than within two weeks of the end of each rotation. The program director discusses the evaluations with the fellows as necessary. The evaluation form must be submitted to the SCFHS Regional Scientific Committee within four weeks of the end of the rotation.

The evaluation of CanMEDS-based competencies evaluation is based on whether or not the trainee fulfills the minimum clinical skills for performing the procedures, as determined by the program.

Structured Academic Activities (SAA) is an academic task that should be documented on an annual basis. The SAA includes data on attendance and participation in HDEAs, grand rounds, case presentations (evaluated using the CBD form and journal club meetings).

Procedures log book is a clinical assignment that should be documented on an electronic tracking system E-logbook (Assessment system) on a regular basis.

Evaluation of research activities is performed twice per academic year. All fellows are required to conduct a research project during their training. Two research days are held in each academic year (mid-year and at year-end, where the research project of each fellow is evaluated. The component evaluated and the scoring system used is based on the SCFHS Rheumatology Fellowship Research Manual (Appendix VIII).

2.2 Formative Assessment Tools

Trainee should show competency in each assessment tool in order to be promoted to the subsequent training level; for further details please refer to the policy on

(https://www.scfhs.org.sa/MESPS/TrainingProgs/RegulationBoard/documents2/Rules_for_Assessments_Training.pdf)

Learning Domain	Formative Assessment Tools
Knowledge	1. Structured Academic Activates 2. Case Based Discussion (CBD)
Skills	1. Log Book 2. DOPS: Direct Observation for Procedural Skills 3. Mini-CEX: mini-Clinical Evaluation Exercise 4. Research Activities
Attitude	1. ITER: In-Training Evaluation Report

3. Summative Assessment

3.1. General Principles

Summative assessment is the component of assessment that aims primarily to make informed decisions on trainees' competency. In comparison to the formative one, *summative assessment* does not aim to provide constructive feedback. For further details on this section please refer to general bylaws and executive policy of assessment (available online: www.scfhs.org). In order to be eligible to set for the final exams, a trainee should be granted "*Certification of Training-Completion*".

3.2. Promotional clinical examination

Near the end of the first academic year (around the month of November), each junior fellow (F1) will have to undergo OSPE and OSCE with at least 6–8 stations. These examinations are organized by the Rheumatology Scientific Committee. The fellows must pass these assessments, as well as additional assessments, in order to be promoted to the next academic level (F2).

Blueprint of promotion OSCE exam is shown in the following table:

Example of clinical promotion exam Blueprint

NO	Program Component	No of stations	Domains of clinical competence							
			Communication		Examination	cognitive			procedures	
			HT	OCS	PE	Invs	Tx	IATF	TP	DP
1	Inflammatory arthritis&Sjogren									
2	CTD&APS									
3	Spondyloarthopathy									
4	pregancy and rheumatic diseases									
5	Emergency rheumatology									

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6	Infection and rheumatology									
7	Rheumatic medications side effects									
8	Surgery and rheumatic diseases									
9	Bone disease									
9	Technique									
10	Other									
11	Vasculitis									
	total	6-8								

Communication: HT=Focused History Taking, OCS=other communication skills.
 Physical Examination: PE = Physical examination, Practical Procedures: DP=Diagnostic Procedure, TP=Therapeutic Procedure, IATF=Identification of Abnormal Test Finding,
 Invs= investigations, TX=Treatment

3.3. Promotional Written examination

This examination is solely for first-year fellows (F1) and takes place near the end of the first academic year. Successful completion of this important assessment is mandatory for the fellow to be promoted to the next level (F2).

Blueprint of promotion written exam is shown in the following table:

Example of written promotion exam Blueprint

Rheumatology promotion written examination Content Category (blueprint)						
Section	Basic & pathophysiology	Clinical presentation	Investigation diagnosis	Management	% of Exam	Number of questions
Rheumatoid Arthritis	2%	4%	4%	5%	15%	18
SLE & APS	1%	4%	3%	4%	12%	14
Vasculitides		3%	4%	4%	11%	13
Infections and Related Arthritides		3%	2%	2%	7%	8
Spondyloarthritis	1%	3%	3%	3%	10%	12
Crystal-induced Arthropathies	1%	3%	1%	2%	7%	8
Osteoarthritis and Related Disorders	1%	2%	2%	2%	7%	8
Regional Pain Syndromes		4%	2%	4%	10%	12

ASSESSMENT OF LEARNING

Metabolic Bone Disease	1%	1%	1%	1%	4%	5
Miscel. topics, ethics & communication	1%	3%	2%	2%	8%	10
Other Rheumatic and Connective Tissue Diseases		3%	2%	3%	8%	10
basic science	1%				1%	2
Total	9%	33%	26%	32%	100%	120

3.4. Final evaluation at the end of the second year

Final In-Training Evaluation Reports (FITER) and Comprehensive Competency Report (CCR)

The Rheumatology Scientific Committee confirms the successful completion of the clinical requirements (based on the fellow's One 45 logbook). Additionally, the program directors prepare a FITER/CCR (Appendix X) for each fellow at the end of the final academic year of the fellowship (F2).

3.5. Certification of Training-Completion

In order to be eligible to set for final specialty examinations, each trainee is required to obtain "Certification of Training-Completion". Based on the training bylaws and executive policy (please refer to www.scfhs.org) trainees will be granted "Certification of Training-Completion" once the following criteria is fulfilled:

- Successful completion of all training rotations.
- Completion of training requirements as outlined by scientific council/committee of specialty (e.g. logbook, research, others).
- Clearance from SCFHS training affairs, that ensure compliance with tuitions payment and completion of universal topics.

"Certification of Training-Completion" will be issued and approved by the local supervisory committee or its equivalent according to SCFHS policies.

A certificate acknowledging training completion will only be issued to the fellow upon successful fulfillment of all program requirements. Candidates passing all components of the final Rheumatology examination are awarded the "Saudi Board of Rheumatology" certificate.

3.6. Final Specialty Examinations

Final specialty examination is the summative assessment component that grant trainees the specialty's certification. It has two elements:

- Final written exam: in order to be eligible for this exam, trainees are required to have "Certification of Training-Completion".
- Final clinical/practical exam: Trainees will be required to pass the final written exam in order to be eligible to set for the final clinical/practical exam.

Rheumatology Board Examination

The final Saudi Rheumatology Board Examination contains a written and a clinical part.

A. Written examination

This examination assesses the fellow's knowledge of theoretical and basic science (including recent advances) and problem-solving abilities in matters associated with the field of rheumatology. The examination is delivered in MCQ format and held once a year (typically, in the month of March). The number of examination items, eligibility criteria, and passing scores are established in accordance with the training and examination rules and regulations established by the SCFHS Commission. Examination blueprints are published on the Commission's website: (<https://www.scfhs.org.sa/examinations/TrainingExams/Pages/PostGradPB.aspx>).

Passing the written examination is mandatory for proceeding to the clinical examination.

B. Clinical examination

This examination assesses a broad range of high-level clinical skills including data gathering, patient management, communication, and counseling. The examination is held once a year (typically, in the month of January), and preferably consists of an OSCE, which may include data interpretation tasks, and an SOE, which may include patient management problems. Eligibility criteria and passing scores are established in accordance with the training and examination rules and regulations established by the SCFHS Commission. Examination blueprint are published on the Commission's website: (<https://www.scfhs.org.sa/examinations/TrainingExams/Pages/PostGradPB.aspx>).

Planning of fellow assessment (formative & summative) activities and composition of the marks				
Training level	Assessment tool(formative and summative)	Content	Required to pass %*	Note
F1	ITER (Mini-CEX, DOPS, CBD)	All rotations	Using borderline/ clear pass/ fail scale*	Being promoted to F2 requires passing in all assessment tools.*
	Structured Academic Activates & Procedures Log book	Lectures CBD HDEA attendance Log book		
	Promotional OSPE & OSCE	Clinical and practical cases		
	Promotional written exam	MCQs		

ASSESSMENT OF LEARNING

F2	ITER (Mini-CEX, DOPS,CBD)	All rotations		Being eligible for the final exam requires passing in all assessment tools.*
	Academic task & Procedures Log book	Lectures , CBD , HDEA attendance Log book		
	Research	Published, accepted, submitted with abstract, peer review		
Final Board Certification Examination	Board written exam	MCQs	As per SCFHS examination rules and regulations	Need Certification of Training-Completion
	Board clinical exam	SOE & OSCE		

*Marking description for assessment tools

Mark	Less than 50%	50%-59.4%	60%-69.4%	more than 70%
Description	Clear fail	Borderline fail	Borderline pass	Clear pass

Suggested learning resources

No particular sources are endorsed by the program. However the following pieces of popular literature can serve to guide the trainees throughout their training.

1. Textbooks

- Gary Firestein, Ralph Budd, Sherine E Gabriel, Iain B McInnes, James O'Dell. Kelley and Firestein's Textbook of Rheumatology, 10th Edition. Amsterdam: Elsevier; 2016
- Annamaria Iagnocco, Eric Hachulla, Hans Bijlsma (Editors). EULAR Textbook on Musculoskeletal Ultrasound in Rheumatology. London: BMJ Books; 2016
- Johannes W.J. Bijlsma, Eric Hachulla (Editors). EULAR Textbook on Rheumatic Diseases, 2nd Edition. London: BMJ Books; 2015
- Marc C. Hochberg, Alan J. Silman, Josef S. Smolen, Michael E. Weinblatt, Michael H. Weisman. Rheumatology, 6th Edition. Maryland Heights, MO: Mosby; 2014
- David Isenberg, Peter Maddison, Patricia Woo, David Glass, Ferdinand Breedveld (Editors). Oxford Textbook of Rheumatology, 3rd Edition. Oxford: Oxford University Press; 2004
- Anne Brower, Donald Flemming. Arthritis in Black and White, 3rd Edition. Amsterdam: Elsevier; 2012
- Peter J. Delves, Seamus J. Martin, Dennis R. Burton, Ivan M. Roitt. Roitt's Essential Immunology, 13th Edition. Hoboken, NJ: Wiley-Blackwell; 2017
- John H. Klippel. Primer on the Rheumatic Diseases, 11th Edition. Atlanta, GA: Arthritis Foundation; 1997

- <https://www.uptodate.com/contents/table-of-contents/rheumatology>
 - Marcy B. Bolster (Editor). The Medical Knowledge Self-Assessment Program MKSAP: Rheumatology. Philadelphia, PA: American College of Physicians; 2009
 - Continuing Assessment Review Evaluation (CARE) ACR publication
2. Scientific journals
- Arthritis & Rheumatology
 - Arthritis Care & Research
 - Current Opinion in Rheumatology
 - Annals of the Rheumatic Diseases
3. References
- (1) <https://www.rheumatology.org/Learning-Center/Fellows-in-Training-Resources>
 - (2) <https://scfhs.ac-knowledge.net/main-page>
 - (3) <http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e>

Saudi Commission for Health Specialties - Rheumatology Fellowship Research Manual*

Definition of research

Research is the systematic and rigorous investigation of a situation or problem in order to generate new knowledge or validate existing knowledge. Research is conducted in many areas of health care, where it can provide many potential benefits; such areas include professional practice, environmental issues affecting health, vitality, treatments, theory development, health care economics, and many others. Most studies conducted in the field of health care are referred to as clinical research studies.

Clinical research is a branch of healthcare science that determines the safety and effectiveness (efficacy) of medications, devices, diagnostic products, and treatment regimens intended for human use. The findings of clinical research studies may be used to promote or develop agents, equipment, techniques, and policies for prevention, diagnosis, treatment, and palliation.

Type of research studies

- Basic medical research, typically in the areas of cellular and molecular biology, medical genetics, immunology, neuroscience, and psychology.
- Preclinical research, typically covering studies that set the stage for clinical research with patients. Preclinical research may not always require ethical approval (unless involving work with animals), is supervised by scientists rather than by medical doctors, and is carried out in a university or company rather than in a hospital or surgery unit.
- Clinical research involves the direct study of patients and clinical data, is generally supervised by medical doctors, is conducted in a medical setting such as a hospital, and requires ethical approval.
- The clinical phase of drug testing is referred to as a clinical trial.

Types of clinical study design

- Meta-Analysis: a study that combines data from different research studies and employs rigorous statistical processing

- **Systematic Review:** a summary of the clinical literature, with critical assessment and evaluation of all research studies that address a particular clinical issue. The researchers use a set of criteria and a systematic method of locating, assembling, and evaluating a body of literature on a particular topic. A systematic review typically includes a description of the findings of the collection of research studies reviewed.
- **Randomized Controlled Trial:** a controlled clinical trial that randomly assigns participants to two or more groups. There are various methods to randomize study participants into groups.
- **Cohort Study (Prospective Observational Study):** a clinical research study in which individuals who presently have a certain condition or receive a particular treatment are followed over time and compared with another group of individuals who do not have the condition of interest.
- **Case-Control Study:** a study beginning with the outcomes, and without prospective follow-up. The researchers choose individuals with a particular outcome (the cases) and individuals without the outcome of interest (the controls), and interview the groups or check their clinical records to ascertain the presence of relevant differences or trends. They then compare the odds of experiencing an event while having the outcome, against the odds of experiencing an event while not having the outcome.
- **Cross-Sectional Study:** the observation of a defined population at a single point in time or during a time interval. Exposure and outcome are determined simultaneously.
- **Case Reports and Series:** report on a patient or series of patients with an outcome of interest. No control group is involved.
- **Ideas, Editorials, Opinions:** put forth by experts in the field.

Bioethical training and certification

Each fellow should take an online ethical course that requires testing of acquired knowledge and certification. Most universities provide such courses, either for free or with subscription. The most popular courses and certifications are those provided by the National Institutes of Health or by the Collaborative Institutional Training Initiative.

Research Funding

In many countries, research funding is provided by research bodies or private organizations that distribute financial resources to cover equipment costs and salaries. In the Kingdom of Saudi Arabia, common funding bodies include the research center within each individual institute, King Abdul-Aziz City for Science and Technology, charity organizations such as the Sanad Charitable Association, and pharmaceutical companies.

Research Steps

- 1) Selection of the research topic and design of the research project
- 2) Assembly of the research team
- 3) Approval of the research project by the local training committee
- 4) Preparation of proposal with references
- 5) Fulfilling the institutional review board (IRB) requirements (in particular, ethics review)
- 6) Obtaining IRB approval
- 7) Data collection
- 8) Data analysis
- 9) Writing the paper
- 10) Publication

Research Duration, Components, and Presentation

During the two years of the Rheumatology Training Fellowship Program (RTFP), a total of 4 weeks (one block) is assigned for the completion of an individual research project. The Fellows are encouraged to start the research project as early as during the first weeks of training.

During the first year, the candidate should select the research project, write the proposal, and apply for IRB approval. The Fellow should be able to present the research work during the research day organized at year-end, at which time a total score of 100 points is distributed as follows: 25% for the selection of the research project, 50% for completion of the research proposal, and 25% for submitting the proposal for IRB approval (confirmed by a letter from the IRB indicating that the research proposal has been accepted for evaluation).

During the second year, the candidate should obtain the IRB approval (25%), perform data collection (50%) and start analyzing the data (25%). The Fellow should be able to present a project report during the research day organized mid-year.

During the last two months of the second year, the candidate should complete the analysis and the writing of the final research manuscript. The Fellow is advised to submit the research manuscript for publication. During the end-of-year research day, the Fellow should present detailed data and a manuscript including abstract, method of study, results, discussion, and references. The candidate will not be eligible to sit for the final written and clinical examination without a certificate of completion of training, which needs a satisfactory completion of the research rotation (available online: www.scfhs.org). The certificate of completion of the training program is issued and signed by Rheumatology scientific committee.

Evaluation of research activities

The research work performed over the course of two years should be assessed and scored by the RTFP Committee for Scientific Research. A score from 0% to 100% is recorded for each section of the Research Evaluation Sheet (Appendix VIII). Completion of research training is evaluated as follows: 15% for the proposal, 15% for IRB approval, 20% for data collection and analysis, and 50% for trying for publication or at least well written manuscript. The passing mark for research training will follow the satisfactory/borderline pass/fail scale.

Research Days

During every training year, two research days are organized.

- A mid-year research day held that replaces a HDEA session in September.
- An end-of-year research day held during the fourth week of January.

Each fellow should be ready to present the required component of their research work during the research days.

Journal Selection

A local or international indexed journal can be chosen for dissemination of the research results. Fellows should be encouraged to publish in international journals.

Publication

Although not a mandatory for completion of the research rotation, each research project is encouraged to be published or at least accepted in a known journal.

*adapted from the Saudi Commission for Health Specialties - Pediatric Hematology-Oncology Fellowship Research Manual, by Dr. Hassan Trabolsi and Dr. Saad Al Daama

Guidelines for the Mentor**Trainee Support and Mentoring Guidelines**

A Mentor is a designated faculty member tasked with the supervision of professional development of Fellows under his or her responsibility. Mentoring is the process by which Mentors provide support to the Fellow (i.e., the Mentee).

Needs of the Fellow

Post-graduate fellowship training is a formal academic program for Fellows to develop their full potential as future specialists. This is potentially the last substantial training program before the candidates become independent specialists. However, unlike the undergraduate program, which has a well-defined structure, fellowship training is inherently less organized. Fellows are expected to be present in clinical settings delivering patient care. They are rotated through multiple sites and sub-specialties. This structure of the fellowship program, while necessary to ensure adequate clinical exposure, does not provide an opportunity to create a long-term professional relationship with a faculty member. Fellows may feel lost without proper guidance. Moreover, in the absence of a long-term longitudinal relationship, it is extremely difficult to identify struggling Fellows. Finally, the new curriculum involves a more substantial work-based continuous assessment of clinical skills and professional attributes. Fellows are expected to maintain a logbook, undergo mini-CEX and DOPS assessments, and meticulously chart their clinical experiences. This requires a robust and structured monitoring system, with clear accountability and well-defined responsibilities.

Nature of the Fellow-Mentor Relationship

Mentorship is a formal yet friendly relationship, and can be seen as a partnership between the Mentor and Fellow (i.e., the Mentee). Fellows are expected to take the mentoring opportunity seriously and help the Mentor to achieve the required outcomes. The Mentor should receive a copy of any adversarial report by other faculty members concerning the Mentee.

Goals of Mentoring

- A. Guiding Fellows towards personal and professional development through continuous monitoring of their progress
- B. Early identification of struggling Fellows, as well as of high achievers
- C. Early detection of Fellows who are at risk of suffering emotional and psychological disturbances
- D. Providing career guidance

Roles and Responsibilities of the Mentor

The primary role of the Mentor is to nurture a long-term professional relationship with the assigned Fellows. The mentor is expected to provide an “academic home” for the Fellows so that they can feel comfortable in sharing their experiences, expressing their concerns, and clarifying issues in a non-threatening environment. The Mentor is expected to keep sensitive information concerning the Fellows strictly confidential, but to make appropriate and early referrals to the Program Director or Head of the Department if she/he identifies a problem that requires expertise or resources beyond the Mentor’s capacity. Examples of such a referral might include:

- I. Serious academic problems
- II. Progressive deterioration of academic performance
- III. Potential mental or psychological issues
- IV. Personal problems that interfere with academic duties
- V. Professional misconduct, etc.

However, the following are **NOT** expected responsibilities of a mentor:

- VI. Providing extra tutorials, lectures, or clinical sessions
- VII. Providing counselling for serious mental and psychological problems
- VIII. Becoming involved in the Fellows’ personal matters
- IX. Providing financial or other material support

Responsibilities of the Fellow as a Mentee

1. Submits a resume at the beginning of the relationship
2. Provides the mentor with medium-term (1–2 years) goals
3. Takes primary responsibility in maintaining the relationship
4. Schedules quarterly meetings (every 3 months) with the Mentor in a timely fashion; does not request ad-hoc meetings, except in an emergency
5. Recognizes self-learning as an essential element of fellowship training
6. Reports any major events to the Mentor in a timely fashion

Who Can Be a Mentor?

Any faculty member of consultant grade and above within the fellowship program can be a Mentor. No special training is required. The number of Fellows per Mentor should not exceed six. As much as possible, the Fellows assigned to the same Mentor should come from all years of training, which will create an opportunity for the senior Fellows to work as guides for the junior Fellows.

Frequency and Duration of Engagement

The recommended minimum frequency for meetings is once every 12–16 weeks. Each meeting may take 30 min to 1 hour. It is also expected that, once assigned, the Mentor should preferably continue with the same Fellow for the entire duration of the training program.

Topics to Be Addressed During the Mentor-Fellow Meetings

The following are suggested tasks to be completed during the meetings:

- (I) Discuss the overall clinical experience of the Fellows, with particular attention to any concerns raised.
- (II) Review the logbook or portfolio with the Fellows in order to determine whether the Fellow is on target to meeting the training goals.
- (III) Revisit earlier concerns or unresolved issues, if any.
- (IV) Explore any non-academic factors seriously interfering with training.
- (V) Document excerpts of the interactions recorded in the logbook.
- (VI) Mandatory reporting to the Program Director or Head of the Department should the Fellow have any of the following issues:
 - A. Absence from three consecutive scheduled meetings, without any valid reasons
 - B. Unprofessional behavior
 - C. Consistent underperformance in spite of counseling
 - D. Serious psychological, emotional, or health problems that may potentially cause unsafe patient care
 - E. Any other serious concerns the Mentor may have

Job Title: Fellow

A Trainee in the Saudi Rheumatology Fellowship Training Program and reporting to the Program Director.

Responsibilities: all levels (F1 & F2)

1. Demonstrate commitment to the general regulations regarding training, issued by the SCFHS.
2. Demonstrate commitment to all components, rotations, and courses included in the training program of Rheumatology.
3. Demonstrate commitment to the rules and regulations of the health facilities that serve as host training centers in the fellow is rotating.
4. Attend all clinics per the assignment issued by the Clinical Coordinator.
5. Perform a comprehensive history taking and complete physical examination of patients, applying the rheumatological approach; prepare a clearly written report of the patient's assessment and differential diagnosis of rheumatic and medical problems, and initiate the plan of management.
6. Discuss the plan of management, including investigations and treatment plan, with the senior and communicate the plan to the nurse assigned to care for the patient.
7. Perform the basic procedures necessary for the diagnosis and management of rheumatologic conditions, according to the level of training and competency.
8. Perform all jobs required from the fellow during hospital rotation, according to the level of training and competency.
9. Complete and submit all components of the training portfolio and the ITER on time and using the approved forms.
10. Attend and actively participate in all academic activities of the Rheumatology training program.
11. Attend all scheduled meetings with the supervisor/mentor and discuss the learning progress (educational activities, projects, research, etc.) based on the data stored in the training portfolio.

12. Be punctual, attending all clinical and academic duties while arriving and leaving on time.
13. Demonstrate professional conduct; respect patients, families, and colleagues; ensure patient safety; and provide high-quality care.
14. Not remain absent except for emergency reasons acceptable to the Trainer and Program Director. Trainers should be notified of nonattendance, and should report such events to the Program Director.
15. Be accessible at all times during working hours and respond promptly.

Additional Responsibilities for Senior Fellows

In addition to the responsibilities mentioned above, the following are additional responsibilities of senior Fellows:

- 1) Review the notes and orders of other rotating residents, discuss the proposed plan of management, and supervise its implementation.
- 2) During working hours and while on call, help and supervise the residents and junior Fellows to interpret the results of laboratory investigations and to perform bedside diagnostic and therapeutic procedures.
- 3) Assist the residents and junior Fellows in acquiring computer skills necessary for searching the literature, as well as in following evidence-based approaches to patient care
- 4) Participate actively in the education and training of medical students, interns, residents, and junior Fellows.

Chief Fellow

Eligibility and Appointment

Senior Fellows (F2) are eligible candidates for Chief Fellow. Fellows in the Rheumatology Fellowship Training Program may elect the Chief Fellow formally (by ballot voting) or informally. The Rheumatology Scientific Committee provides the final approval and makes the official appointment.

Term of Appointment

1. Chief Fellows will be elected no later than March 15 of the academic year.
2. The appointment will be for a period of one academic year.
3. The appointment is valid as long as the individual is on rotation within the program and performing their duties adequately.

Job Description

The Chief Fellow will perform the following duties:

1. Act as an advocate for the Fellows in the program.
2. Act as liaison between Fellows and Trainers/Consultants.
3. Serve as a representative for the Fellows, attending meetings related to teaching and administrative issues.
4. Organize and facilitate certain academic or scientific activities.
5. Participate in the planning of the content and schedule of reaching activities.
6. Draft the agenda of Fellows' meetings and chair the meetings held
7. Act as a resource person for new Fellows

8. Orient incoming Chief Fellow regarding their new responsibilities.
9. Perform any other mandates requested by the Rheumatology Scientific Committee.

Evaluation of Performance

The Rheumatology Scientific Committee will evaluate the performance of the Chief Fellow on a quarterly basis (every three months). Evaluation will be based on whether or not the Chief Fellow has fulfilled the responsibilities listed in the job description. The Scientific Committee will provide support to Chief Fellows in fulfilling their role.

Evaluator guidelines

Item	Description
History taking skills	Helps patients tell their stories; uses appropriate questions to obtain accurate and relevant information effectively; responds to verbal and nonverbal cues appropriately
Physical examination skills	Follows an efficient, logical sequence of steps; examinations are appropriate for the clinical problems assessed; provides patients with explanations; is sensitive to the patients' comfort and modesty
Communication skills/Professionalism	Explores the patients' perspectives; uses jargon-free speech; is open, honest, and empathic; discusses and establishes management plans and therapies with the consent of the patients; shows respect, compassion, and empathy; establishes trust; attends to the patients' comfort needs; respects confidentiality; behaves in an ethical manner; is aware of legal frameworks and personal limitations
Clinical judgment / Management	Forms appropriate diagnoses and suitable management plans; orders and performs selected and appropriate diagnostic studies; considers risks and benefits
Counselling skills	Explains rationale for test/treatment; conveys information in a clear manner tailored to the patient's needs; able to respond to the patient and repeat information in a different way; recognizes the patient's own wishes and gives them priority; avoids personal opinion and bias
Organization and efficiency	Prioritizes; is timely and succinct; summarizes clinical care outcomes effectively; demonstrates global judgment based on the above topics
Overall clinical judgment	Demonstrates global judgment based on the above topics

APPENDICES

- i. Mini Clinical Evaluation Exercise (Mini-CEX) Description
- ii. Direct Observation of Procedural Skills (DOPS)
- iii. IN-TRAINING EVALUATION REPORT - RHEUMATOLOGY
- iv. Saudi Board of Rheumatology Portfolio Assessment
- v. Provisions of the Case-Based Discussions (CBD) assessment
- vi. Example of Weekly Schedule of Formal Educational Activities
- vii. Final In-Training Evaluation Report (FITER)
- viii. Example of Rheumatology half-day educational activities

Appendix i

Description of competencies assessed during the Mini Clinical Evaluation Exercise (Mini-CEX)

1. **Medical Interviewing Skills:** The Fellow helps the patient describe their problem; uses questions and directions effectively in order to obtain accurate, relevant, and complete information; responds appropriately to body-language and non-verbal cues; identifies and explores the patient's issues and concerns within the scope of a focused consultation.
2. **Physical Examination Skills:** The Fellow follows an efficient, logical sequence of assessments; uses screening/diagnostic steps adequate for the specific problem assessed; informs the patient regarding the necessary steps and the protocol of the examination; is sensitive to the patient's comfort and modesty.
3. **Professionalism/Humanistic Qualities:** The Fellow shows respect, compassion, and empathy, establishes trust, and attends to patient's needs regarding comfort, confidentiality, modesty.
4. **Counseling Skills:** The Fellow explains the rationale for testing and treatment and obtains the patient's consent for such procedures; educates/counsels the patient regarding the management of the condition; where appropriate, explains the natural history of the rheumatic disease, including the prognosis; if the patient is pregnant or lactating, discusses adequate treatment options.
5. **Clinical Judgment:** The Fellow orders/performs selected and adequate diagnostic studies; considers risks and benefits; interprets clinical investigations results and correlates these with the patient's history and symptoms; justifies treatment recommendations based on current evidence, multidisciplinary advice, and relevant patient-related factors.
6. **Organization/Efficiency:** The Fellow prioritizes tasks adequately; interventions and communication are timely and succinct.
7. **Overall Clinical Competence:** The Fellow demonstrates judgment, empathy, caring, effectiveness, and efficiency.

Fellows are expected to undergo a minimum of three Mini-CEXs during rotation in general rheumatology (i.e., every 12 weeks), and, preferably, one Mini-CEX at the end of each four-week rotation block.

Every three months, the Fellow shall meet with the Mentor to discuss the overall Mini-CEX results and make sure of that the portfolio contains the required number of Mini-CEXs (see Appendix VI).

APPENDICES

	Saudi Commission for Health Specialties *SCFHS - Cardiac Surgery	Evaluated : evaluator's name By Evaluating : person (role) or moment's name (if applicable) Dates : start date to end date
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* Indicates a mandatory response

Trainee's name:

Trainee's level:

Date of Assessment

20180124

Brief Summary of Case:

	Below expectations (1)	Borderline (2)	Meets expectations (3)	Above expectation (4)	Unable to comment
1) Medical Interview Skills	☐	☐	☐	☐	☐
2) Physical Examination Skills	☐	☐	☐	☐	☐
3) Counselling and Communications Skills	☐	☐	☐	☐	☐
4) Clinical Judgement	☐	☐	☐	☐	☐
5) Consideration for Patient/Professionalism	☐	☐	☐	☐	☐
6) Organisation/Efficiency	☐	☐	☐	☐	☐
7) Organisation/Efficiency	☐	☐	☐	☐	☐
8) Overall Clinical Competence	☐	☐	☐	☐	☐

Comments :

Which aspects of the encounter were done well?

Suggested areas for improvement / development?

Agreed Actions / learning plan:

Student's reflections on patient and areas of learning:

	Consultant	Associate Consultant	Senior Registrar	Registrar	Fellow
Assessor's position:	☐	☐	☐	☐	☐

Others (specify):

Time taken for Observation & Feedback (in minutes):

Assessors Surname:

Assessors Signature:

The following will be displayed on forms where feedback is enabled...

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APPENDICES

(for the evaluator to answer...)

*Did you have an opportunity to meet with this resident to discuss their performance?

☐ Yes

☐ No

(for the evaluatee to answer...)

*Are you in agreement with this assessment?

☐ Yes

☐ No

Please enter any comments you have (if any) on this evaluation.

Appendix ii

Description of competencies assessed in the Direct Observation of Procedural Skills (DOPS) assessment

1. Selects adequate procedures and generates a suitable treatment plan; clearly explains to the evaluator the indications for the procedure, the relevant anatomy, and the essential steps of the procedure.
2. Obtains informed consent from the patient after explaining the procedure and risk of complications; conveys information that is complete, relevant, clear, and jargon-free; is sensitive to the patient's concerns, respects confidentiality, listens actively, answers questions correctly, and ensures that the patient understands the matter before providing consent; establishes trust.
3. Administers effective and safe analgesia or sedation; selects an appropriate local anesthetic agent (or sedative) and checks with the nursing staff; injects the appropriate volume using the correct needle and technique.
4. Demonstrates good aseptic techniques and the safe use of instruments/sharp objects; supervises and follows high standards of aseptic operative techniques; handles instruments and sharp objects safely.
5. Performs the technical aspects of excision by following the standard guidelines; follows well-established protocols for the procedure, demonstrates good technique; uses instruments appropriately, handles tissue gently, controls bleeding appropriately, sutures skin neatly and atraumatically.
6. Handles the instruments adequately; follows the correct protocols for instrument handling techniques.
7. Demonstrates the correct suturing technique (if applicable).
8. Dresses the wound adequately and provides post-procedure counseling.
9. Demonstrates awareness of complications and ability to manage them.
10. Shows professionalism and consideration for the patient during the procedure; demonstrates respect and understanding of the patient's requirements regarding comfort, respect, and confidentiality; demonstrates an ethical approach and awareness of any relevant legal frameworks.
11. Prepares accurate and detailed notes regarding the procedure; makes clear and legible notes, which enables the continuation of effective care by other practitioners.
12. Overall clinical competence in performing the procedure: ensures patient safety at all times; demonstrates good clinical knowledge, judgment, and technique; makes appropriate use of equipment and resources.

Fellows are expected to undergo a minimum of three DOPS evaluations during rotation in general rheumatology (i.e., every 12 weeks), and, preferably, one DOPS evaluation at the end of every four-week block.

Every three months, the Fellow shall to meet with the Mentor to discuss the overall DOPS results and make sure that the portfolio contains the required number of DOPS evaluations (see Appendix VI).

APPENDICES

	Saudi Commission for Health Specialties *SCFHS - Cardiac Surgery	Evaluated : evaluator's name By Evaluating : person (role) or moment's name (if applicable) Dates : start date to end date
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* indicates a mandatory response

Direct Observation Of Procedural Skills – DOPS Assessment

*Procedure:

	Below expectations 1	Borderline 2	Meets expectations 3	Above expectation 4	Unable to comment
*Domain & Comments: Professional Approach (to include communication, consent and consideration of the patient.)	☐	☐	☐	☐	☐
*Knowledge (indication, anatomy, technique)	☐	☐	☐	☐	☐
*Demonstrate appropriate pre-procedure preparation	☐	☐	☐	☐	☐
*Appropriate analgesia or/and sedation	☐	☐	☐	☐	☐
*Technical Ability	☐	☐	☐	☐	☐
*Aseptic Technique	☐	☐	☐	☐	☐
*Post Procedure Management	☐	☐	☐	☐	☐

comments:

	Competent to perform unsupervised	May need supervision if complications arise	Needs more practice
*Overall Ability to perform Procedure:	☐	☐	☐

Comments:

*Assessor's position:

- ☐ Consultant
☐ Associate Consultant
☐ Senior Registrar
☐ Registrar
☐ Fellow
☐ Senior Resident
☐ Nurse

*Others (specify):

*Complexity of procedure:

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- ☐ Low
☐ Average
☐ High

*Time taken for Feedback & Observation (in minutes):

*Assessors Surname:

*Assessors Signature:

The following will be displayed on forms where feedback is enabled...

(for the evaluator to answer...)

*Did you have an opportunity to meet with this resident to discuss their performance?

- ☐ Yes
☐ No

(for the evaluatee to answer...)

*Are you in agreement with this assessment?

- ☐ Yes
☐ No

Please enter any comments you have (if any) on this evaluation.

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Appendix iii: In-Training Evaluation Report

	Saudi Commission for Health Specialties	Evaluated :evaluator's name
	*SCFHS - Cardiac Surgery	By
		Evaluating :person (role) or moment's name (if applicable)
		Dates :start date to end date

* Indicates a mandatory response

	Unsatisfactory (1)	Below Average (2)	Average (3)	Above Average (4)	Outstanding (5)	Not Applicable (0)
A) Knowledge :	☐	☐	☐	☐	☐	☐
1) Basic	☐	☐	☐	☐	☐	☐
2) Clinical	☐	☐	☐	☐	☐	☐
B) Clinical Skills :	☐	☐	☐	☐	☐	☐
3) History & Physical Examination	☐	☐	☐	☐	☐	☐
4) Clinical Judgment & Decision Making	☐	☐	☐	☐	☐	☐
5) Consultation Skills	☐	☐	☐	☐	☐	☐
6) Performance in Emergencies	☐	☐	☐	☐	☐	☐
7) Appropriate Utilization of Investigation	☐	☐	☐	☐	☐	☐
8) Records & Reports	☐	☐	☐	☐	☐	☐
9) Participation in Scientific Activities	☐	☐	☐	☐	☐	☐
10) Participation in Research	☐	☐	☐	☐	☐	☐
C) Operative And Interventional Skills:	☐	☐	☐	☐	☐	☐
11) Indications & Judgment	☐	☐	☐	☐	☐	☐
12) Technical Skills	☐	☐	☐	☐	☐	☐
Personality And ETHICS :	☐	☐	☐	☐	☐	☐
13) Punctuality	☐	☐	☐	☐	☐	☐
14) Discipline & Reliability	☐	☐	☐	☐	☐	☐
15) Attitude to Patients	☐	☐	☐	☐	☐	☐
16) Attitude to Staff	☐	☐	☐	☐	☐	☐
17) Ability to Supervise	☐	☐	☐	☐	☐	☐

(Total Score / No. of Evaluated Items) * 20 =

The following will be displayed on forms where feedback is enabled...
(for the evaluator to answer...)

*Did you have an opportunity to meet with this resident to discuss their performance?
☐ Yes
☐ No

(for the evaluatee to answer...)

*Are you in agreement with this assessment?
☐ Yes

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☐ No

Please enter any comments you have (if any) on this evaluation.

Appendix iv



Saudi Board of Rheumatology Portfolio Assessment

This form is to be completed at least every three blocks during the mentoring/ supervision meeting with the Fellow.

Fellow: Level: .. ☐ F1 ☐ F2 Reg. No.....,

Mentor: Date: Time:

Clinical rotation:location:.....Duration: from.....to.....

Domain		Achievement required	Score (0=poor, 4=outstanding)				Mark
A. Mini-CEX (3/block)	Minimum number achieved	The Fellow underwent at least three Mini-CEXs in the last block	0	1	2	3	
	Competency assessment score	What were the average results of the assessment?	0	1	2	3	4
			Total=...../7×100=				%
B. DOPS (3/block)	Minimum number achieved	The Fellow underwent at least three DOPS in the last block	0	1	2	3	
	Competency assessment score	What were the average results of the assessment?	0	1	2	3	4
			Total=...../7×100=				%
C. CBD (3/block)	Minimum number achieved	The Fellow underwent at least three CBDs in the last block	0	1	2	3	
	Competency assessment score	What were the average results of the assessment?	0	1	2	3	4
			Total=...../7×100=				%
Overall assessment of portfolio			Total of A+B+C=				%

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Comments:

The original goes to Fellow's file, with a copy to the Program Director and the Fellow.

Appendix V

Provisions of the Case-Based Discussions (CBD) assessment

1. CBD is a way to improve the clinical experience, decision-making, approach, and treatment of the Fellow.
2. Constructive immediate feedback should be provided to the Fellow to highlight the weaknesses and suggest strategies for improvement.
3. CBD should take 20–25 minutes, including history taking, physical examination, diagnosis, and treatment planning.
4. The CBD Evaluator should give immediate feedback regarding clinical knowledge, clinical decision-making, and patient management.
5. CBD aims to test the Fellow for the following: record keeping, history taking, interpretation of clinical findings, establishment of the management roadmap including follow-up and future planning, with focus on the professional qualities.
6. The cases for discussion are chosen by the Evaluator.
7. The choice should preferentially involve common rheumatic cases that the Fellow has had the chance to encounter during the rotation. The cases can be chosen from the inpatient, outpatient, or consultation settings.
8. The discussion can be focused on a single long case or several short cases that cover a wide range of clinical problem areas.
9. The Fellow should arrange the CBD encounter with the Evaluator and provide them with a copy of the standardized CBD form.
10. The Fellow must undergo at least one CBD assessment in every core Rheumatology rotation (i.e., every four weeks) and one during the Pediatric Rheumatology rotation.
11. Every three months, the Fellow shall meet with the Mentor to discuss the overall CBD results and make sure that the portfolio contains the required number of CBD assessments (see Appendix VI).

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	Saudi Commission for Health Specialties M.R.Peds-PS,Dr.Fakeeh- Jeddah	Evaluated : evaluator's name By Evaluating : person (role) or moment's name (if applicable) Dates : start date to end date
---	--	--

* Indicates a mandatory response

*Trainee's name:

*Trainee's level:

Date of Assessment (dd/mm/yyyy):

Brief description of case
including curricula
areas covered:

	Below expectations 1	Borderline 2	Meets expectations 3	Above expectation 4	Unable to comment
Domain & Comments	☐	☐	☐	☐	☐
Clinical Assessment :	☐	☐	☐	☐	☐
Investigations and referrals	☐	☐	☐	☐	☐
Management plan	☐	☐	☐	☐	☐
Follow-up and future planning	☐	☐	☐	☐	☐
Overall clinical judgement	☐	☐	☐	☐	☐
Organisation	☐	☐	☐	☐	☐

comments:

Which aspects of the encounter were done well?

Suggested areas for improvement / development?

Agreed Actions / learning plan:

Assessor's position:

- ☐ Consultant
☐ Associate Consultant
☐ Senior Registrar
☐ Registrar
☐ Fellow

Others (specify):

Complexity of Case:

- ☐ Low
☐ Average
☐ High

Time taken for Observation & Feedback (in minutes)

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Basis for discussion:

- ☐ Outpatient case/record/letter
☐ Discharge Summary
☐ Inpatient case/consult/record

Assessors Surname:

Assessors Signature:

The following will be displayed on forms where feedback is enabled...

(for the evaluator to answer...)

*Did you have an opportunity to meet with this resident to discuss their performance?

- ☐ Yes
☐ No

(for the evaluatee to answer...)

*Are you in agreement with this assessment?

- ☐ Yes
☐ No

Please enter any comments you have (if any) on this evaluation.

Appendix vi



Saudi Board in Rheumatology Research Evaluation Criteria

PART ONE: TEXT/WRITTEN EVALUATION		
SR. NO	ITEM	CRITERIA FOR ASSESSMENT
1	Originality of Topic	- To what extent was the topic selected novel? - Was there innovation in the research methodology compared with approaches followed in previous studies?
2	Abstract/Summary	- Structured abstract (Background/methods/results/conclusions/key words) - Was the abstract: ✓ Brief—not exceeding 300 words ✓ Structured ✓ Accurate: with no data not present in or in contradiction with the main text ✓ Complete: including the following components: A. Introduction/Background: the problem to be studied, the research questions or hypothesis(es) B. Methods: techniques used to collect and/or analyze the data C. Results: the most important findings D. Conclusion & Recommendations: implications of the findings
3 I n t r o d u c t i o n	Literature Review	- Was the literature review performed skillfully? - Was the literature reviewed pertinent to the research? - To what extent could the general review of the literature be criticized on the grounds of insufficiency or excessiveness? - Does the text demonstrate the ability of the Fellow to identify key ideas in the literature and to compare, contrast, and critically review them? - Was there any plagiarism? - Did the review cover all the important aspects of the topic? - Was the review free from any redundancy? - Did the review provide evidence of the significance and rationale of the study?

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	Aims & Objectives	• Was the aim of the study clearly defined and placed within the context of current knowledge? Were the hypotheses to be tested and the research questions to be answered clearly stated? • Were the specific objectives stated clearly and appropriately? • Was the relationship between the current and previous research in related topic areas defined? • Was the nature and extent of the research contribution clear?
4	Materials & Methods	• Was the methodology appropriate and described clearly in regard to the reference population and the sample characteristics, sample size, and sampling techniques? • Were the methods used for data collection appropriate? • Were the main study variables specified? • Were potential confounders recognized and either controlled for by virtue of the research design or properly measured? • Does the text demonstrate the Fellow's ability to collect the data? • Were valid and reliable instruments used to collect the data? • Given the facilities available, did it seem that the best possible techniques were employed to gather data? • Were limitations inherent in the study recognized and stated?
5	Results & Analysis	• Was there evidence of care and accuracy in recording and summarizing the data? • Was the data presentation well organized and clear? • Were the statistical methods used to analyze the data suitable and accurate? • Were the results adequately and logically presented? • Was the presentation of the results free from duplications between the tables, figures, and text?

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6	Discussion, Conclusions, & Recommendations	• Were the results ✓ Summarized but not repeated ✓ Interpreted in view of the current knowledge ✓ Compared with findings from relevant studies • Were the discrepancies with previous studies explained? • Were the conclusions reached justifiable in the light of the results and the way they were analyzed? • Did the summary comprehensively reflect the contents of the study? • Were the recommendations ✓ Based on the study findings ✓ Specific ✓ Applicable ✓ Potentially helpful in solving a problem
7	Ethical Considerations	• Were the following ethical considerations observed in planning and in the implementation of the study? ✓ Approval from a scientific body ✓ Official permission from center(s) that served as the study settings ✓ Informed consent ✓ Confidentiality • Was due credit given to previous writers for ideas and techniques used by the author? • Were people involved in the study appropriately acknowledged?
8	Style & Structure of the Text, Tables, & Figures	• Was the style clear and readable with regard to Sentence structure ✓ Vocabulary ✓ Paragraph length ✓ Paragraph independence • Was the text free of (or with minimal) errors in ✓ Grammar ✓ Spelling ✓ Punctuation • Was the layout attractive in terms of ✓ Fonts ✓ Headings and sub-headings ✓ Margins ✓ Alignment of text and bullets • Was there logical breakdown and order consistent with a reasonable account of the research work? • Were the study findings presented in an effective and appropriate manner through text, tables, and appendices?

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		• Did the tables and figures enhance the understanding of the text? • Did the report format and length comply with the requirements of the program?
9	References	• Were the references used ✓ Relevant ✓ Recent (unless justifiable) • Were the references prepared in accordance with the Vancouver style? • Was the reference list complete (nothing missing, nothing extra)? • Was the use of secondary references minimal?

PART TWO: ORAL DEFENSE EVALUATION		
SR. NO	ITEM	CRITERIA FOR ASSESSMENT
1	Presentation	• Did the presenter master the subject? • Was the presentation informative, highlighting the study ✓ Background ✓ Aim and objectives ✓ Methods ✓ Findings ✓ Conclusions and implications • Was the presentation attractive with regard to ✓ Use of suitable audio-visual aids ✓ Not lengthy ✓ Candidate speaking freely rather than reading from slides ✓ Proper voice level, clear speech
2	Defense & Discussion	• Was the candidate aware of every minute detail of the work? • Was the candidate able to ✓ Defend, explain, and elaborate on any part of the study? ✓ Recognize errors and how to correct them ✓ Recognize the limitations of the study ✓ Avoid any defensive attitude

Saudi Board in Rheumatology Research Evaluation Sheet

Name of the candidate: _____

☐ F1 ☐ F2 Date: _____

Research title: _____

	COMPONENT	Mark	CANDIDATE SCORE	COMMENTS
Part 1 Written/ Text Evaluation	1. Originality of topic	3		
	2. Abstract/summary	5		
	3. Aims and objectives	5		
	4. Literature review	6		
	5. Methodology	12		
	6. Results (data analysis, presentation)	12		
	7. Discussion, conclusions, and recommendations	5		
	8. Ethical considerations	2		
	9. Style and structure of the text, tables, and diagrams	5		
	10. References	5		
	Total Written Evaluation	60		
Part 2 Defense	1. Presentation	30		
	2. Defense	10		
	Total Defense Evaluation	40		
	Total Cumulative Mark	100		

≥60% = Pass; <60% = Revision

Result: ☐ Pass ☐ Revision ☐ Recommendation

Correction within: (____) weeks

Evaluator name: _____ Signature, date: _____

Saudi Board in Rheumatology Final Research Results Sheet

Name of the candidate _____

☐ F1 ☐ F2 ___ Date: _____

Research title: _____

Research Component	Mark	Final Grade
Written	60	
Oral Defense	40	
TOTAL	100	

Result: ☐ Pass ☐ Revision

Recommendation: (attach paper if necessary):

Local Program Director name & signature: _____

Date: _____

Saudi Board in Rheumatology Cumulative Research Evaluation Sheet

Name of the candidate: _____

☐ F1 ☐ F2 Date _____

Research title: _____

Component	MARKS		Final Grade
	Evaluator #1	Evaluator #2	
Written			
Oral Defense			
TOTAL			

≥60% = Pass, <60% = Revision

Name of Research Supervisor: _____

Result: ☐ Pass ☐ Revision ☐ Recommendation

Correction within (____) Weeks

Evaluation Panel:

Name of Evaluator #1, signature: _____ Date: _____

Name of Evaluator #2, signature: _____ Date: _____

Appendix vii

Example of Weekly Schedule of Formal Educational Activities for Off-Call Fellows					
Time	Sunday	Monday	Tuesday	Wednesday	Thursday
8 am	Morning Report	Morning Report	Morning Report	Morning Report	Morning Report
9 am	Rheumatology	Rheumatology	Rheumatology	Rheumatology	GR, including: CP&D JC q4 weeks MM q12 weeks JM q12 weeks
10 am	Outpatient	Outpatient	Outpatient	Outpatient	
11 am	Service	Service	Service	Service	
12 noon					
1 pm	Rheumatology	Rheumatology Fellowship Half-Day Educational Activity	MSK physical examination	Rheumatology	Meeting with Mentor/3 months MINI-Cex /monthly DOPS/ monthly CBD/monthly
2 pm	Outpatient		Practice procedures and injection technique	Outpatient	
	Service		MCQ session/ monthly	Service	
3 pm					
4 pm					
5 pm					

GR: grand round; CP&D: case presentation and discussion; JC: journal club; JM: joint meeting; MM: mortality & morbidity conference; MCQ: multiple-choice questions; Mini-CEX: Mini Clinical Evaluation Exercise; MSK, musculoskeletal; CBD: Case-Based Discussions; DOPS: Direct Observation of Procedural Skills

Appendix viii

Example of Weekly Schedule of Formal Educational Activities for On-Call Fellows					
Time	Sunday	Monday	Tuesday	Wednesday	Thursday
8 am	Morning Report	Morning Report	Morning Report	Morning Report	Morning Report
9 am	Consultation, Day Care, Inpatient Service	Consultation, Day Care, Inpatient Service	Consultation, Day Care, Inpatient Service	Consultation, Day Care, Inpatient Service	GR, including: CP&D JC q4 weeks MM q12 weeks JM q12
10 am					
11 am	Bedside teaching of residents by on-call Fellow			residents topic select session by fellow	
12 noon					
1 pm	Consultation, Day Care, Inpatient Service	Rheumatology Fellowship Half-Day Educational Activity	MSK physical examination	Consultation, Day Care, Inpatient Service	Meeting with Mentor/ 3 months mini-CEX/ monthly DOPS/ monthly CBD/monthly
2 pm			Practice procedures and injection technique		
3 pm	Residents CBD q2 weeks by Fellow		MCQ session/ monthly		
4 pm					
5 pm					

MM: mortality and morbidity conference; MCQ: multiple-choice questions; Mini-CEX: Mini-Clinical Evaluation Exercise; GR: grand round; CP&D: case presentation and discussion; JC: journal club; JM: joint meeting; MSK, musculoskeletal; CBD: Case-Based Discussions; DOPS: Direct Observation of Procedural Skills

References:

- Frank JR, Snell L, Sherbino J, editors. CanMEDS 2015 Physician Competency Framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.).