RHEUMATOLOGY AND IMMUNOLOGY FELLOWSHIP ATTACHMENT PROGRAMME IN SGH

Components	Information
1. Division/ Department	Medicine / Department of Rheumatology and Immunology
2. Title of Programme	Fellowship Training in Rheumatology & Immunology
3. Relevant Registrations	• Temporary Registration with Singapore Medical Council (SMC) • Training employment pass application with Ministry of Manpower, Singapore (MOM) (upon successful Temporary Registration with Singapore Medical Council)
4. Overview 4.1 Background information	During the fellowship programme, the Rheumatology Fellow will undertake a broad range of practical clinical experiences including care of inpatients with acute and chronic rheumatic diseases, ambulatory care, prevention, and rehabilitation, attend a programme of formal education activities, and have exposure to and involvement with current research activities. The programme will encompass rotations through Rheumatology inpatient and outpatient services, with continuity clinics and various subspecialty clinics in Rheumatology. All modules, training and rotations are designed to cultivate basic competency and proficiency in Rheumatology for Internists in General Medicine or develop proficiency in an area of subspecialty for trained Rheumatologists.
4.2 Goal/ aim(s)	This programme is designed to reflect the importance of competency-based training and assessment in graduate medical education, and to emphasize the six core competencies as follows: 1. Medical knowledge a. Fellows must demonstrate knowledge of biomedical, clinical, epidemiological and social-behavioural aspects of rheumatic diseases, as well as the application of this knowledge to patient care. b. Perform necessary technical skills specific to the management of patients with rheumatic diseases. 2. Patient care a. Fellows must be able to provide compassionate, comprehensive, evidence-based and cost-effective diagnosis, investigation and management of patients with rheumatic disease, and promote healthy living. b. Counsel patients and the broader community on the prevention of and rehabilitation in rheumatic diseases. 3. Practice-Based Learning and Improvement a. Undertake accurate self-appraisal, develop a personal continuing education strategy and pursue lifelong mastery of Rheumatology to maintain and improve professional skills. b. Understand and critically appraise the design, implementation and interpretation of published research and apply it relevantly to patient care. 4. System-Based Practice a. Function as a member of the health care team and coordinate the team as appropriate.

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	b. Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to effectively call on other resources in the system to provide optimal health care. 5. Interpersonal and Communication Skills a. Communicate effectively and compassionately with referring primary care physicians, specialists in medical subspecialties, surgeons, allied health professionals, patients and their families on the continuing care of rheumatology patients. b. Communicate constructively and effectively with other Rheumatologists and physicians (especially referring physicians) and other health care professionals. 6. Professionalism a. Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
4.3 Duration	2 - 12 months • Nailfold capillaroscopy training – 2-3 months • Musculoskeletal Ultrasound training – 3-12 months
4.4 Hyperlinks/URL Sites	https://www.sgh.com.sg/patient-care/specialties-services/Rheumatology-and-Immunology/Pages/Rheumatology-and-Immunology-Overview.aspx
5. Target Audience	Training of young rheumatologists. The Fellow must have a long-term commitment to continue clinical work or research in their home country.
5.1 Pre-requisite /eligibility requirement(s)	General requirements for Temporary Registration for training (required by SMC): • A basic medical degree from an accredited medical university or medical school • Passed the relevant national licensing examination in the country of conferment of conferment of basic degree, where applicable • Evidence of at least 12 months houseman-ship / internship with a certificate of satisfactory completion of houseman-ship or equivalent • Been registered as a medical practitioner in the country where he is currently practising • Been certified to be of good standing by the Medical Council or the relevant national authority **Note**: The doctor should be in active clinical practice (and been registered as a medical practitioner in the countries of practice) for the 3 years preceding the application for medical registration in Singapore. In addition to the above criteria, **Clinical Fellows** must: a) Have a minimum of 3 years working experience as a medical officer (or equivalent) b) Fulfil English Language requirements of SMC if the medium of instruction for the basic medical qualification is not in English c) Preferably have obtained a postgraduate diploma or medical degree in his country or overseas

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	d) Be sponsored by (i) the government, or (ii) regional health authority or (iii) an appropriate institution in the home country. For (d)(iii), the doctor must be on current full-time employment (40 hours or more per week) with the sponsoring institution. As a Clinical Fellow, the doctor will be allowed to be involved in patient care and make entries in patients' case note, communicate care plans to patients and fellow healthcare professionals, and perform procedures under direct supervision or Level 1 supervision under SMC's Supervisory Framework. **Department's requirement, if any (only for Clinical Fellow in this subspecialty):** • Postgraduate medical qualification e.g. MMEd or equivalent • Minimum 2 years of postgraduate training experience in relevant specialty (after obtaining the postgraduate medical qualification) • Current position as Registrar, Resident or equivalent (AST level)
6. Learning Objectives	This fellowship would allow the Fellow to acquire: • Clinical skills and acumen in the diagnosis and management of a wide variety of rheumatic disorders. • Knowledge of the appropriate use of support services including radiology and laboratory services in immunology, microbiology etc. • Skills in performing basic joint aspirations and injections. • Awareness of the role and benefits of a multidisciplinary team in management of rheumatic diseases, including other medical and surgical disciplines, physiotherapy, occupational therapy, podiatry, rehabilitation, medical social work, nurse education. • Some experience in clinical/laboratory research in the field of Rheumatology if desired by the Fellow.
7. Course/Training Syllabus	The programme will cover the following areas: 1. Medical knowledge a. Basic sciences including anatomy and biology of musculoskeletal tissues, immunology, purine and acid metabolism, biomechanics of bones, joints and muscles and neurobiology of pain. b. Clinical sciences including pathogenesis, epidemiology, clinical expression, treatments, and prognosis various rheumatic diseases, therapeutic modalities (pharmacology, rehabilitation and disability issues and surgical management), physical and biologic basis for diagnostic tests in Rheumatology and clinical characteristics of these tests. c. Research principles including essential components of quality experimental design, clinical trial design, data analysis, and interpretation of results, and the importance of adherence to ethical standards of experimentation. 2. Patient care a. Fellows should be able to demonstrate ability to gather information, formulate a treatment plan, and reassess the patient during follow-up. 3. Practice-based learning and improvement

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	a. Fellows should be able to evaluate the care provided to both individual patients as well as to groups of patients in each practice, appraise and assimilate scientific evidence relevant to clinical problems encountered, evaluate care provided in the context of this evidence, and effect improvements in patient care based upon these evaluations. b. In addition to structured learning of the basic components of medical knowledge and patient care, the Fellow must evaluate their knowledge base and care delivery on an ongoing basis with the goal of continually improving that care. 4. System-based practice a. The Fellow should be able to able to appreciate the different Rheumatology practices and delivery systems, be aware of the principal partners in healthcare delivery, advocate for the patient and provide cost-effective healthcare. 5. Interpersonal and communication skills a. The Fellow should be able to gather information effectively and accurately, understand and incorporate the patient's perspective into treatment plans, provide information to the patient and establish trust with the patient and family. 6. Professionalism a. The Fellow should be able to uphold the following tenets of medical professionalism, such as patient autonomy, informed consent, beneficence and non-maleficence, communication, justice, as well as appreciate situations of medical futility and conflicts of interest, and respect patient confidentiality.
8. Training Method	**Method of Supervision:** Direct observation and feedback. Fellow will be supervised by an assigned supervisor at all times. **Observed Only:** Fellows will have opportunities to observe the following procedures: a) Nailfold capillaroscopy **b)** Ultrasound-guided injections of the joints and diagnostic ultrasound scans of the joints **Hands-On Experience:** Fellows will assist in the following procedures under supervision: a) Nailfold capillaroscopy **b)** Ultrasound-guided injections of the joints and diagnostic ultrasound scans of the joints <u>Specific knowledge / skills</u> : i) Clinical skills and acumen in the diagnosis and management of a wide variety of rheumatic disorders

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	ii) Knowledge of the appropriate use of support services including radiology and laboratory services in immunology, microbiology etc. iii) Skills in performing basic joint aspirations and injections. iv) Awareness of the role and benefits of a multidisciplinary team in management of rheumatic diseases, including other medical and surgical disciplines, physiotherapy, occupational therapy, podiatry, rehabilitation, medical social work, nurse education. <u>Types of cases / procedures</u> : A wide variety of rheumatological conditions, including: i) Rheumatoid Arthritis ii) Spondyloarthropathies iii) Systemic lupus erythematosus and other connective tissue diseases iv) Systemic vasculitis v) Degenerative arthritis and soft tissue rheumatism Fellows will be given opportunities to learn joint injections and aspirations, by observing an experienced Rheumatologist, and subsequently performing the procedures once deemed competent i.e. after performing a minimum of 3 supervised procedures per joint. <u>Clinical duties and hours (include on call duties. If any)</u> : Clinics: Fellows will be expected to sit in as observers in Specialist outpatient clinics consisting of General Rheumatology patients and will also be given the opportunity to conduct outpatient clinics after the first two weeks, seeing New and Follow-Up patients under the supervision of accredited Rheumatologists. Average number of clinic sessions per week: 1-2 Average number of cases per session: 10-12 It is anticipated that the Fellow will see a wide range of Rheumatology cases, including Rheumatoid Arthritis, Gout, Spondyloarthritis, Systemic Lupus Erythematosus and other connective tissue diseases. Wards: Trainees will have the opportunity to see a wide range of rheumatic conditions in the wards. When rostered for ward duties, they may be responsible for first line patient care, including management of acute and chronic issues. They will do daily AM and PM ward rounds as part of their ward responsibilities. Respective consultants rostered for wards will lead the ward rounds. The average duration of ward work during entire period of attachment is 40 %. This is an essential part of the learning experience as

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	Trainees will be exposed to a wide variety of patients with complex rheumatological conditions which require multidisciplinary involvement for optimal care. Referrals / Consultation Services: During the attachment, Clinical Fellows will spend approximately 40% of the total period providing consultation service for referrals from other inpatient disciplines. The Trainee will work under the supervision of an accredited Rheumatologist. These referrals cover a wide-ranging spectrum of Rheumatological & Immunological conditions and provide a rich source of learning and experience for Trainees, as each case will be reviewed by an Accredited Rheumatologist with opportunities for discussion. Short attachments may be arranged with one or more of the following departments, taking into consideration the needs of individual Trainees. The options are not exclusively limited to the departments listed below. The Schedule of Elective programmes will be based on availability of elective slots in the various departments. The duration of each individual elective is up to 1 week per elective; and a maximum of 2 weeks for the 6-month fellowship, and 4- weeks for the 12-month fellowship. Mutual arrangement with the relevant departments will be made through respective Department Heads, with the Trainee responsible for detailed arrangements. i) Physiotherapy ii) Occupational Therapy iii) Podiatry iv) Radiology v) Immunology vi) Dermatology <u>Teaching responsibilities, if any</u> : Ad-hoc teaching of residents/ medical officers/ medical/ other students posted to the Department as part of ward rounds/ clinical duties. <u>Research activity, if any</u> : A research component will be planned for the Fellow to gain an understanding of basic principles of research. The specific areas of research will consider the area of interest of the Fellow and the department's objectives, following a discussion with the Supervisor and HOD. This research component is encouraged but is optional to allow flexibility to meet the needs of different Trainees. <u>Compulsory didactic sessions e.g. meeting, discussion, etc, if any</u> : CME Activities / Educational Programmes i) Presentations based on self directed learning:

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a. 1-2 per month (e.g. eCAT, Journal Club, Clinical Case Presentation), A "CAT" refers to a critically appraised topic, which summarises the best available evidence, and aims to answer a clinical question. CAT is essentially patient based, in that it begins with a clinical question generated from a specific patient situation or problem. CAT has direct relevance to clinicians by allowing clinical application of concepts of evidence-based medicine to the care of specific patients.
b. The content for these presentations shall be selected from the Singapore Rheumatology Senior Residency Training syllabus, a copy of which will be given to the Fellow.

ii) Once Weekly (Senior Consultant-led) Grand Ward Rounds

iii) Once Weekly CME programmes consisting of
a. Journal Club
b. Radiology Round with Musculoskeletal Radiologists from the Department of Diagnostic Radiology, SGH
c. Clinical Case presentations
d. Topic Reviews
e. Combined Meetings with various departments in the Division of Medicine, Surgery and/or Ambulatory Care and Support Services; for example, Department of Dermatology, Department of Respiratory and Critical Care Medicine, Department of Renal Medicine, Department of Neurology, Department of Endocrine, Department of Nuclear Medicine, Singapore National Eye Centre, and others.
f. National Core Rheumatology Series tutorials for Senior Residents

iv) There are periodic national Rheumatology meetings co-organised by the Singapore Society of Rheumatology and Chapter of Rheumatology after normal working hours which the Fellow would be encouraged to attend.

Job Rotation within SGH and to other institution not required.
<table>
<tr><th colspan="3">TRAINING ACTIVITIES & METHODOLOGY</th></tr>
<tr><th>Name of activity</th><th>Frequency / No. of sessions / Length of session</th><th>Teaching methodology</th></tr>
<tr><td>Grand Ward Rounds</td><td>Weekly</td><td>Large group teaching</td></tr>
<tr><td>Fellow Teaching sessions</td><td>Weekly</td><td>Small group teaching</td></tr>
<tr><td>Radiology Rounds</td><td>Monthly</td><td>Small group teaching</td></tr>
<tr><td>Clinical case presentations</td><td>Monthly</td><td>Large group teaching</td></tr>
<tr><td>Topic Reviews</td><td>Monthly</td><td>Large group teaching</td></tr>
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Components	Information		
	National Core Rheumatology Series	Bi-monthly	Small group teaching
	Talks by Invited Overseas Speakers	Monthly	Large group teaching
	Online voice annotated videos, reading materials	As needed	E-learning
8.1 Night Duties Requirement	No night duties required		
8.2 Running of Clinics Requirement	Running of outpatient clinics under the supervision of accredited Rheumatologists.		
9. Assessment and Evaluation	Fellows will need to demonstrate their proficiency level based on the following competencies: 1) **Patient Care** The Fellows are expected to provide quality patient care that is compassionate, appropriate and effective for the treatment of rheumatic diseases and the promotion of health. Fellows should be able to demonstrate ability to: 1. Gather information a. Demonstrate competency in obtaining a clinical history, relevant review of systems, and assessing functional status of patients with rheumatic disease symptoms. b. Demonstrate competency in performing and interpreting the examination of the structure and function of all axial and peripheral joints, periarticular structures, peripheral nerves and muscles. Additionally, the resident should be able to identify extra-articular findings that are associated with specific rheumatic diseases. c. Understand the indications for and costs of ordering laboratory tests, procedures to establish a diagnosis of rheumatologic disease and of different therapies used in the management of these diseases. d. Understand the principles and interpretation of results of synovial fluid analysis and become proficient in the examination and interpretation of synovial fluid under conventional and polarized light microscopy from patients with a variety of rheumatic diseases. e. Demonstrate competence in the interpretation of investigations ordered f. Apply the principles of clinical epidemiology to day-to-day clinical decision making, demonstrating understanding and competency in the indications for and the interpretation of results of laboratory tests and procedures to establish a diagnosis of a rheumatologic disease. 2. Formulate a treatment plan		

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	a. Demonstrate the ability to construct a list of differential diagnoses in patients presenting with signs and symptoms related to rheumatologic diseases and to outline further testing necessary to establish the correct diagnosis. b. Demonstrate the ability to construct and implement an appropriate treatment plan for the care of a patient with a rheumatologic problem integrating the prescribing of medications (oral, injectable or infused), counselling, rehabilitative medicine, and, where necessary, surgical or other consultation. The fellow should be able to explain the rationale and the risks/benefits of the treatment plan. c. Demonstrate a working knowledge of clinical pharmacology for medications, understand the dosing, pharmacokinetics, metabolism, mechanisms of action, side effects, drug interactions, compliance issues, costs, and use in patients including fertile, lactating, and pregnant women. d. Understand the indications for and demonstrate competence in arthrocentesis. The Fellows should understand the anatomy, precautions and potential sequelae of arthrocentesis and demonstrate competency in obtaining synovial fluid from or administering local steroid injections to diarthrodial joints, bursae and tenosynovial structures with adequate informed consent. The Fellows should also know the benefits of using ultrasound guidance for joints or periarticular structures which are difficult to access. e. Understand pain assessment and management f. Understand changes required in patient management should the rheumatology patient become pregnant; this should include pre-pregnancy counselling about effects of pregnancy on the disease process, the use of medications before and during pregnancy and in the postpartum period. g. Demonstrate the ability to identify physical impairment; relate the impairment to the observed functional deficits; prescribe appropriate rehabilitation (physical therapy, occupational therapy) to achieve goals to improve the defined impairment. h. Understand indications for surgical and orthopedic consultation in acute and chronic rheumatic diseases. i. Understand challenges in the pre- and post -operative management of the surgical patient. j. Be aware of experimental therapies e.g haemopoietic stem cell therapy 3. Reassessment and patient follow-up a. The Fellow should be able to demonstrate the ability to reassess the patient overtime, including recognition of treatment related adverse events, and alter the treatment plan accordingly. This should include principles of stepping-up and stepping down immunomodulatory therapy, and guidelines for drug monitoring.
	2) Medical Knowledge The content stated below is referenced from what is covered by a Rheumatology senior resident over 3 years. The Fellow should at least achieve a basic level understanding of basic sciences and clinical sciences at the end of

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	his/her training, which is personalised to his/her required learning outcomes, and is not expected to cover the 3 year program within the short training period. **Basic sciences** A working knowledge of the basic and clinical sciences that relate to musculoskeletal and rheumatic disease is fundamental to the practice of Rheumatology. Understanding of normal and pathogenic processes of the immune system forms the basis of reliable diagnosis and the development and use of an increasingly sophisticated range of immunomodulatory treatments for the rheumatic diseases. Similarly, knowledge of the basis for and use of laboratory tests of immune activity is a principal asset of the practicing Rheumatologist. Rheumatology Fellows should have practical understanding of the approaches and modalities used by other specialists and allied health professionals for the treatment of rheumatic diseases to manage the care of their patients effectively. The training program will teach and emphasize the cognitive skills that are necessary to apply this detailed knowledge to problem solving for diagnosis, treatment and research of the rheumatic diseases. The rheumatology patient will often have other medical co-morbidities that will constantly require the residents to apply their knowledge of general internal medicine, and manage these concurrently. The Fellows should demonstrate some knowledge of the anatomy, basic immunology, genetic basis, cell biology, and metabolism pertaining to rheumatic diseases, disorders of connective tissue, metabolic disease of bone, osteoporosis, and musculoskeletal pain syndromes, which includes: 1. Anatomy and Biology of Musculoskeletal Tissues a. Connective tissue cells and components b. Joints and ligaments c. Bone d. Muscle and tendons e. Blood vessels 2. Immunology a. Anatomy and cellular elements of the immune system e.g lymphoid organs, immune system organization, lymphocytes, antigen-presenting cells, natural killer cells, neutrophils and eosinophils. b. Immune and inflammatory mechanisms e.g antibody structure and diversity, receptor and ligand interactions, molecular basis of T cell antigen recognition and activation, B cell receptors, antigens, major histocompatibility complex, immune cell signalling pathways, complement and kinin systems and acute phase reactants. c. Cellular interactions and immunomodulation d. Immune responses e.g antibody-mediated, cell-mediated, IgE-mediated, mucosal immunity, innate immune response, pathologic immune response.

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	e. Immunoregulation e.g central and peripheral tolerance, graft versus host response. 3. Purine and Uric Acid Metabolism a. Purine: biochemistry, synthesis, and regulation b. Uric acid: origin, elimination, and physicochemical properties c. Crystals: factors affecting formation, induction of inflammation d. Purine pathway enzyme deficiencies and immunodeficiency: Adenosine deaminase deficiency, Purine nucleoside phosphorylase deficiency. 4. Biomechanics of Bones, Joints and Muscles 5. Neurobiology of Pain a. Peripheral afferent nociceptive pathways b. Central processing of nociceptive information c. Mechanisms of action of drugs used for the treatment of neuropathic pain **d.** Biopsychosocial model of pain **<u>Clinical sciences</u>** 1. Rheumatic Diseases For each disease, the Fellows should demonstrate knowledge of the pathogenesis, epidemiology, clinical expression, treatments, and prognosis of the full range of rheumatic and musculoskeletal diseases. a. Rheumatoid Arthritis b. Spondyloarthritis including arthritis associated with acne and other skin diseases, SAPHO syndrome c. Lupus erythematosus: systemic, discoid, subacute and acute cutaneous lupus, lupus panniculitis and drug-related; d. Antiphospholipid antibody syndrome: Primary and secondary e. Scleroderma: diffuse and limited systemic sclerosis, localized syndromes, chemical/drug induced f. Vasculitides: polyarteritis nodosa, Wegener's granulomatosis and other ANCA-associated diseases, Churg-Strauss, polymyalgia rheumatica, Takayasu's arteritis, systemic necrotizing vasculitis overlaps, Behcet's disease, hypersensitivity and small vessel angiitis, cryoglobulinemia, Cogan's syndrome g. Other systemic connective tissue diseases: Sjögren's syndrome, relapsing polychondritis, adult-onset Still's disease, overlap syndromes, mixed connective tissue disease, undifferentiated connective tissue disease h. Infectious arthritis: bacterial (non-gonococcal and gonococcal), mycobacterial, spirochaetal (syphilis, Lyme), viral (HIV, Hepatitis B and C, parvovirus, Chikungunya, dengue), fungal i. Reactive arthritis: acute rheumatic fever, arthritis associated with sub-acute bacterial endocarditis, intestinal bypass arthritis, post-immunization arthritis, other colitis-associated arthropathies j. Metabolic, endocrine and hematologic disease associated rheumatic disorders, including: (i) Crystal-associated diseases: monosodium urate monohydrate (gout), calcium pyrophosphate dehydrate deposition disease, basic calcium phosphate

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	(hydroxyapatite), calcium oxalate; (ii) Endocrine-associated diseases; (iii) Hematologic/ lymphoreticular-associated diseases: Kikuchi's lymphadenitis, Castleman's Disease k. Bone and cartilage disorders, including: (i) Osteoarthritis – primary and secondary osteoarthritis, chondromalacia patellae; (ii) Metabolic bone diseases: osteoporosis, osteomalacia; (iii) Paget's disease of bone; (iv) Avascular necrosis of bone; (v) Others: hypertrophic osteoarthropathy, diffuse idiopathic skeletal hyperostosis, insufficiency fractures l. Hereditary, congenital, and inborn errors of metabolism associated with rheumatic syndromes, including: (i) Disorders of connective tissues: Marfan's syndrome, osteogenesis imperfecta, hypermobility syndrome; (ii) Immunodeficiency: common variable immunodeficiency, hypogammaglobulinemia, selective IgA deficiency, complement deficiency; (iii) Auto-inflammatory syndromes m. Non-articular and regional musculoskeletal disorders, including: (i) Fibromyalgia; (ii) Myofascial pain syndromes; (iii) Axial syndromes: low back pain, spinal stenosis, intervertebral disc disease and radiculopathies, cervical pain syndromes, coccydynia, osteitis condensans ilii, osteitis pubis, spondylolisthesis/spondylolysis, discitis; (iv) Regional musculoskeletal disorders: bursitis, tendinitis, or enthesitis (e.g. shoulder-rotator cuff tear, adhesive capsulitis, impingement syndrome; wrist ganglions; trigger fingers and Dupuytren's contractures; hallux rigidus, heel pain, and metatarsalgia; temporomandibular joint syndromes; costochondritis; (v) Biomechanical/anatomic abnormalities associated with regional pain syndromes: scoliosis and kyphosis, leg length discrepancy, foot deformities; (vi) Overuse rheumatic syndromes: occupational, sports, recreational, performing artists; (vii) Sports Medicine: injuries, strains, sprains, female athlete, medication issues; (viii) Entrapment neuropathies: thoracic outlet syndrome, upper extremity entrapments, lower extremity entrapments; (ix) Others: reflex sympathetic dystrophy, erythromelalgia. n. Neoplasms and tumour-like lesions o. Muscle diseases, including: (i) Inflammatory polymyositis, dermatomyositis, inclusion body myositis; (ii) Primary metabolic disorders e.g glycogen storage disease and secondary metabolic disorders e.g nutritional, toxic, endocrine disorders, electrolyte disorders; (iii) Muscular dystrophies; (iv) Myasthenia gravis p. Miscellaneous diseases e.g amyloidosis, Charcot joint, remitting seronegative symmetrical synovitis with pitting edema, multicentric reticulohistiocytosis, foreign body synovitis, arthritic and rheumatic syndromes associated with: sarcoidosis, scurvy, pancreatic disease, autoimmune hepatitis, primary biliary cirrhosis, drugs, rheumatic disease in the geriatric population, pregnant patients, patients with chronic hepatitis B and C and dialysis patients, Cutaneous manifestations of systemic disease: erythema nodosum, Sweet's syndrome, ocular manifestations of systemic disease. 2. Therapeutic modalities and Strategies a. Pharmacology

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	i. The Fellow should demonstrate knowledge of the pharmacokinetics, metabolism, adverse events, interactions, and relative costs of drug therapies used in the management of rheumatic disorders. b. Rehabilitation and disability issues i. The Fellow should demonstrate knowledge of the appropriate employment of principles of physical medicine and rehabilitation in the care of patients with rheumatic disorders. ii. The Fellow should understand the Importance of multidisciplinary approaches to rehabilitation and pain control. Appropriate use of and referral/prescription to rehabilitation specialists and pain clinics. iii. The Fellow should appreciate the various rehabilitation modalities commonly prescribed e.g splinting, hydrotherapy, ultrasound, joint protection and energy conservation techniques, adaptive equipment and devices, footwear and orthotics, acupuncture and other alternative modalities. iv. The Fellow should appreciate the psychosocial aspects of disability. c. Surgical management i. The Fellows should know the indications for surgical and orthopaedic consultation, including indications and interpretation of arthroscopy and joint replacement/arthroplasty as well as preoperative evaluation and medication adjustments, complications. 3. Diagnostic testing a. The Fellows should demonstrate knowledge of the physical and biologic basis of the various diagnostic tests used in Rheumatology, and the clinical test characteristics of these tests, which includes: i. Erythrocyte sedimentation rate, C-reactive protein, and other acute phase reactants ii. Rheumatoid factors and Anti-cyclic citrullinated peptide antibodies iii. Antinuclear antibodies including methodologies and limitations of each (indirect immunofluorescence vs ELISA) iv. Anti-dsDNA v. Antibodies to extractable nuclear antigens (anti-Sm, anti-RNP, anti-Ro, anti-La) vi. Anti-topoisomerase 1, and anti-synthetase antibodies including anti-Jo-1 vii. Anti-neutrophil cytoplasmic antibodies including specificities for neutrophil granule constituents [anti-proteinase 3, anti-myeloperoxidase] viii. Lupus anticoagulant ix. Antiphospholipid antibodies including anti-cardiolipin and beta-2-glycoprotein antibodies x. Cryoglobulins xi. Antibodies to formed blood elements including direct and indirect Coombs testing, anti-platelet antibodies

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	xii. Assays for complement activity and components of the complement cascade xiii. Quantitative serum immunoglobulin levels, serum protein electrophoresis and immunofixation electrophoresis xiv. HLA typing and methods xv. Serologic and PCR tests for HIV, Hepatitis B, Hepatitis C, parvovirus, cytomegalovirus Serum and urine measurements for uric acid xvi. Iron studies including ferritin xvii. Flow cytometry studies for analysis of lymphocyte subsets xviii. Interferon gamma release assays for evaluation of latent tuberculosis infection (Quantiferon gold and T-spot TB assays) b. Fellows should know the indications for and interpretation of various diagnostic imaging techniques, including: i. Bone mineral densitometry; ii. CT of lungs and paranasal sinuses for patients with suspected or confirmed rheumatic disorders, including HRCT lungs and CT pulmonary angiography; iii. Electromyograms and nerve conduction studies for patients with suspected or confirmed rheumatic disorders; iv. MRI of the central nervous system (brain and spinal cord) for patients with suspected or confirmed rheumatic disorders; including principles of T1 and T2weighting, fluid attenuated inversion recovery (FLAIR), diffusion weighted imaging (DWI) v. Plain radiography, arthrography, ultrasonography, radionuclide scans, CT, and MRI of joints including sacroiliac joints, bones, and periarticular structures; vi. Arteriograms (conventional and MRI/magnetic resonance angiogram (MRA)) for patients with suspected or confirmed vasculitis; vii. Schirmer's test; viii. Parotid scans and salivary flow studies; ix. Ultrasound scans of normal and painful musculoskeletal structures commonly encountered in a rheumatology clinic, including synovial joints, periarticular soft tissues, tendons, and ligaments; power doppler for synovitis; erosions; x. Doppler ultrasound scanning of relevant arteries and veins for thrombosis and occlusion, including renal veins, arteries of the limbs; xi. Transthoracic echocardiography and right heart catheterization for evaluation of pulmonary hypertension; xii. Nailfold capillaroscopy for Raynaud's phenomenon. **c.** Fellows should be able to interpret the results of synovial fluid analysis. **Research principles** Exposure to research, if desired, will allow the Fellows to be introduced to the essential components of quality experimental design, clinical trial design, data

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	analysis, and interpretation of results, and the importance of adherence to ethical standards of experimentation. These may include: 1. Principles and methods of epidemiological research a. Definitions of incidence and prevalence b. Basic biostatistics: including major methods of comparative analysis, types of error, likelihood ratios c. Methods of health services research i. Measurement of health and functional status ii. Quality of life measurements/assessments iii. Components of cost analysis 2. Principles of clinical research a. Major study designs and the limitations and biases associated with each b. Diagnostic criteria and assessment of disease activity i. Objective assessments, e.g. tender/ swollen joint count ii. Composite indices (ACR composite, DAS, WOMAC, etc.) iii. Damage and functional indices (e.g. HAQ) c. Clinical trials i. Major design types ii. Definitions and uses of clinical trial phases iii. Roles of principle investigator, sponsors, study coordinators, monitors, institutional review boards (IRB) 3. Evidence-based medicine 4. Bioethics of clinical and basic research 5. Critical literature review
	3) **Practice-Based Learning and Improvement** Practice-based learning and improvement involves the evaluation of care provided to both individual patients as well as to groups of patients in each practice, the appraisal and assimilation of scientific evidence relevant to clinical problems encountered, evaluations of the care provided in the context of this evidence, and effecting improvements in patient care based upon these evaluations. In addition to structured learning of the basic components of medical knowledge and patient care, the Fellow must evaluate their knowledge base and care delivery on an ongoing basis with the goal of continually improving that care. This process includes the following components: 1. Independent learning a. The ability to access and critically appraise appropriate information systems and sources to improve understanding of underlying pathology, assess the accuracy of diagnoses, and gauge appropriateness of therapeutic interventions for the patient population they encounter. 2. Self-evaluation of performance

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	a. The effective resident must engage in ongoing self-assessment activities. This includes the ability to continuously self-evaluate learning needs and to monitor practice behaviours and outcomes to ascertain whether clinical decisions and therapeutic interventions are effective, and adhere to accepted standards of care. 3. Incorporation of Feedback into Improvement of Clinical Activity a. The ability to appropriately interpret results of clinical outcome studies, practice data, quality improvement measures, and faculty/peer feedback and evaluations and apply them to patient care and practice behaviour.
	4) Interpersonal and Communication Skills Interpersonal and communication skills with patients, their families and other health professionals are essential for effective physician-patient and collegial relationships due to the complexity of rheumatic diseases and treatment regimens. Good working partnerships promote medical compliance, improve patient satisfaction and confidence as well as professional collaboration. The Fellow should be able to: 1.Gather information. Reliable and effective communication depends upon the availability of accurate and complete information obtained from patients, their family and the complete medical record. This requires the use of effective listening and communication skills. 2.Understanding and incorporate patient's perspective. Such understanding impacts the ability of the physician to appreciate the functional impact of disease and the desire and ability of the patient to be an active partner in the physician's treatment efforts. 3.Provide information. Effective communication regarding disease causation, diagnosis and treatment in a manner that is understandable to the listener. 4.Establish trust with the patient and family.
	5) **Professionalism** The Fellow should be able to consider the following ethical principles during patient encounters: 1. Autonomy a. Demonstrate the ability to provide autonomy to their patients to decide upon treatment once all treatment options and risks have been outlined for them. 2. Informed consent a. Provide and obtain key elements of informed consent in an understandable manner for therapeutic interventions and clinical research endeavours. 3. Beneficence and non-maleficence

Components	Information
	a. Demonstrate independent medical decision-making skills that are made in the patient's best interests. b. Demonstrate sensitivity and attention to the interests of their patients in the formulation of treatment plans. Demonstrate responsiveness to the needs of patients that supersedes self-interest. c. Exhibit empathy and compassion in physician-patient interactions and is sensitive to patient needs for comfort and encouragement. 4. Communication a. Be courteous and respectful in interactions with patients, staff and colleagues. b. Demonstrate integrity in reporting clinical and research findings to supervisors and colleagues. 5. Justice a. Treat all patients with respect regardless of race, gender, ethnic, religious or socioeconomic background. b. Provide equitable care to all patients. c. Demonstrate culturally competent care, which is defined here as the ability to deliver effective medical care to patients, regardless of cultural or language differences between the patient and the physician. 6. Medical futility, confidentiality and conflicts of interest a. Demonstrate a commitment to ethical principles relating to provision and withholding of clinical care, confidentiality of patient information and business practices. b. Recognize and addresses actual and potential conflicts of interest including pharmaceutical industry involvement in their medical education and programme funding and guarding against this influencing their current and future prescribing habits.
	6) **Systems-Based Practice** Systems-based practice reflects an understanding of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. The Fellow should appreciate the following components of a system-based practice: 1. System. This includes an understanding of the limitations and opportunities of various types of Rheumatology practices and delivery systems, practice management strategies, managed care and health insurance issues. It also comprises an ongoing analysis of the strengths and weaknesses of the local academic system, in both the inpatient and outpatient settings, and its impact on the health care delivery to rheumatic patients. Efforts should be made to identify potentially correctable systematic weaknesses and medical errors due to systems failure and to develop strategies to rectify the problems. 2. Partners in Health Care Delivery. The Fellow should be aware of the principal partners in the delivery of health care to rheumatic patients, including rheumatology nurse clinicians, advanced practice nurses (APN),

<table>
<tr><th>Components</th><th>Information</th></tr>
<tr><td></td><td>medical social workers and allied health professionals (i.e. physiotherapists, occupational therapists and podiatrist).
3. Advocacy for the Patient. The Fellow should understand the importance, opportunities and limits of patient advocacy.
4. Cost-Effective Health Care. The Fellow should understand the principles cost allocation and resource management within local and national systems.</td></tr>
<tr><td>9.1 Assessment approaches</td><td>Formative assessment:
• Regular evaluation between Clinical Fellow and Supervisor / Head of Department
• Reflective journal- logbook recordings of training activities

Summative assessment:
Periodical assessment reports as required by Singapore Medical Council

Feedback:
• End-of-training feedback form as required by Singapore Medical Council
• End-of-training feedback session with SGH-PGMI</td></tr>
<tr><td>9.2 Evaluation Process
9.2.1 General overall grading system</td><td>The general overall grading system evaluates the Clinical Fellow’s performance upon completion of the fellowship programme. All Clinical Fellow will be given a general overall grading status at the end of the fellowship programme based on the grading criteria requirements incorporating the six competencies based knowledge, skills and performance that Clinical Fellow must demonstrate throughout the programme.
<table>
<tr><th>Grading Status</th><th>Description</th><th>Grading Criteria Requirements</th></tr>
<tr><td>CMP</td><td>Completes the programme</td><td>• Fellow completes entire duration of training, and achieves all the competencies of the training programme.</td></tr>
<tr><td>USP</td><td>Unsatisfactory performance</td><td>• Fellow completed duration of the training programme but is not able to achieve the competencies of the training programme.</td></tr>
<tr><td>DCP</td><td>Did not complete the programme</td><td>• Fellow is not able to complete duration of training and achieve the expected competencies in the training programme</td></tr>
<tr><td>WDN</td><td>Withdrawn from the programme</td><td>• Fellow has consistently demonstrated poor performance throughout the training period,</td></tr>
</table></td></tr>
</table>

Components	Information
	demonstrates misdemeanour, misconduct, or medical negligence.
9.3 Criteria for Early Termination	The attachment programme will be terminated early on the ground of the Clinical Fellow's poor performance, misdemeanour, misconduct, negligence or breach of any terms stipulated or referred to in the Fellowship Letter of Offer and Institution Terms and Conditions. The Clinical Fellow may also request to terminate the attachment programme for reasons such as serious illness or other personal obligations. The institution will review all requests for early termination with the Clinical Fellow and the Supervisor / Head of Department.
10. Course Administration	Type of Certification: Certificate of Training Training Fee: S$3,000 (before prevailing GST) per month Programme Funding source: Self-funded
11. Number of Clinical Fellow to be accepted at any one time	4 Fellows