Training Objectives and Requirements in Rheumatology

Training Objectives

The purpose of this Paper is to define the training objectives and requirements for advanced trainees in Rheumatology. It fulfils the requirements of the Specialist Accreditation Board, Ministry of Health (Singapore). It is guided by the UK Joint Committee on Higher Training in Rheumatology, American College of Rheumatology Training Program Directors’ Core Curriculum Outline and the Can MEDS Project 2000 (which describes the fundamental framework of core physician abilities).

It is noted that the American College of Rheumatology (ACR) Syllabus is updated every 2 years. This paper is in line with the most recent version of the ACR Syllabus. It is also noted that the syllabus is not exhaustive because of recent developments in rheumatology; e.g. anti-CCP antibodies were not mentioned in previous versions but are now becoming important in practice.

The local syllabus/curriculum will be reviewed periodically i.e. 2 yearly. This will allow the STC to incorporate and revise this document as new strategies; treatments in rheumatology etc. are formulated. Basic and core content will remain.

On completion of the Rheumatology training program, the advanced trainee will be able to function as a consultant in the following essential roles: medical expert/clinical decision maker, communicator, collaborator, manager, health advocate, scholar, and health professional. The graduate Rheumatologist will have achieved the following general educational objectives and be able to:

1. Provide comprehensive, evidence based and cost-effective diagnosis, investigation and management of patients with rheumatic disease.
2. Counsel patients and the broader community on the prevention of and rehabilitation in rheumatic diseases.
3. 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
4. Communicate constructively and effectively with other Rheumatologists and physicians (especially referring physicians) and other health care professionals.
5. Function as a member of the health care team and coordinate the team as appropriate.
6. Contribute to the education of students, other physicians, other health care professionals, the patients and their families.
7. Perform necessary technical skills specific to the management of patients with rheumatic diseases.
8. Maintain complete and accurate medical records.
9. Undertake accurate self-appraisal, develop a personal continuing education strategy and pursue lifelong mastery of Rheumatology to maintain and improve professional skills.
10. Understand and critically appraise the design, implementation and interpretation of published research and apply it relevantly to patient care.

During the Rheumatology training program the advanced specialty trainee (AST) will undertake a broad range of practical clinical experiences including care of in-patients with acute and chronic rheumatic diseases, ambulatory care, prevention and rehabilitation, attend a program of formal education activities, and have exposure to and involvement with current research activities. The advanced trainee must demonstrate the knowledge, skills and attitudes relating to gender, culture and ethnicity pertinent to Rheumatology. In addition, all advanced trainees must demonstrate an ability to incorporate gender, cultural and ethnic perspectives in research methodology, data presentation and analysis. The advanced trainee must assume increasing responsibility for clinical decision making and patient care and be able to function as an independent clinical decision maker at graduation.

**Duration**

1. All Advanced trainees must have completed Basic Post-Graduate Training with a Masters of Medicine (Internal Medicine), or its equivalent, before entering the program.

2. The usual duration of advanced training in Rheumatology is 3 years. The first 2 years will be spent in a fully-accredited training facility in Singapore (see Appendix I) to enable the advanced trainee to gain experience in the spectrum of Rheumatic diseases seen in Singapore and their management. The advanced trainee may have the opportunity to go abroad for further training during his 3rd year of training the overseas training period can be up to 12 months in a relevant hospital unit, under proper supervision.

3. For Rheumatology ASTs working in a general medicine department under the supervision of a full-time accredited rheumatologist, the following would apply:
   
   a. AST (Rheumatology only): up to six months of such training will be accredited. The remaining 2.5 years will have to be spent attached (if part time, for an equivalent of 2.5 full years) to any of the fully-accredited departments/divisions in (2) above.

4. For the AST (Internal Medicine) working towards double accreditation in Rheumatology, the period of AST (Internal Medicine) and AST (Rheumatology) will be 2 years for each AST respectively.

5. Most of the training program will be clinical work. However the trainee is strongly encouraged to participate in clinical or laboratory rheumatology research. He / she is encouraged to write at least one scientific first-author publication article to be
published in a peer-reviewed journal and/or present a first-authored paper at a regional or international Rheumatology Conference during the 3 years of training.
Training Program

Medical Expert / Clinical Decision Maker

1. General Requirements

   a) Demonstrate diagnostic and therapeutic skills for ethical and effective patient care.
   b) Assess and apply relevant information to clinical practice.
   c) Demonstrate effective consultation services with respect to patient care, education and legal opinions.

2. Specific Requirements

   A Rheumatologist is an expert in all aspects of the diagnosis and management of rheumatic diseases. A Rheumatologist is able to practice contemporary, evidence based, cost effective medicine and avoid unnecessary or harmful investigations or management. A Rheumatologist has specific technical skills in diagnostic and therapeutic techniques. A Rheumatologist must be able to provide care to diverse communities.

   The advanced trainee must demonstrate the appropriate knowledge, skills and attitudes relating to gender, culture and ethnicity, and must understand the importance of these perspectives in research methodology, data presentation and analysis.

   The advanced trainee will demonstrate the knowledge and skills necessary for excellent patient care as stated in the following section, which details the Curriculum.

3. Curriculum

   The trainee is expected to have detailed knowledge of the major diseases encountered in Rheumatology in Singapore. In addition, he / she should also have a broad based knowledge of internal medicine as many rheumatic diseases are complicated by multi-organ involvement.

   For each clinical problem the graduate Rheumatologist should be able to perform a complete and accurate medical and rheumatological history and physical examination, formulate appropriate differential and provisional diagnoses, develop an appropriate plan of investigation and interpret the results, develop a therapeutic plan, develop a plan of secondary prevention and demonstrate appropriate clinical judgment including consideration of such factors as: the patient’s age and other health status; risks, benefits, and costs of diagnostic and therapeutic strategies; and alternative management approaches.
I. Basic Sciences:

A. Basic physiology and anatomy (gross and histopathology) and biology of musculoskeletal tissues: for each tissue, understand the embryology, development, biochemistry and metabolism, structure, function, and classification.

1. Joints and ligaments: diarthrodial joints, intervertebral discs, synovium, cartilage
2. Connective tissue cells and components: fibroblasts, collagens, proteoglycans, elastin, matrix glycoproteins
3. Bone
4. Muscle and tendons
5. Blood vessels

B. Immunology

1. Anatomy and cellular elements of the immune system
   A. Lymphoid organs: gross and microscopic anatomy and function
   B. Specific cells: for each cell type, understand the ontogeny, structure, phenotype, function, and activation markers/receptors
      (1) Monocytes and macrophages
      (2) Lymphocytes: T cells, B cells, NK cells, null cells
      (3) Neutrophils and eosinophils
      (4) Other cells: dendritic cells, mast cells, platelets, endothelial cells, and fibroblasts

2. Immune and inflammatory mechanisms
   A. Antigens: types, structure, processing, presentation, and elimination
   B. Superantigens: types, site of binding, and effect on immune system
   C. Major histocompatibility complex: structure, function, nomenclature, and immunogenetics
   D. B cell receptors/immunoglobulins: structure, function, antigen binding, signaling, genetic basis, effector function
   E. T cell receptors: structure, function, antigen binding, signaling, genetic basis
   F. Receptor - ligand interactions: adhesion molecules, complement receptors, Fc receptors, and signal transduction
   G. Complement/Kinin systems: structure, function, and regulation
   H. Acute phase reactants and enzymatic defenses
3. Cellular interactions and immunomodulation
   A. Cellular activation and regulation: for each cell type, understand mechanisms of activation and suppression of function.
   B. Understand the broad principles with regard to the origin, structure and effect, site of action, metabolism and regulation of cytokines and inflammatory mediators

4. Immune responses
   A. IgE-mediated: acute and late-phase reactions
   B. Immunoglobulin-mediated: opsonization, complement fixation, and antibody dependent cellular cytotoxicity
   C. Immune complex-mediated: physiochemical properties and clearance of immune complexes
   D. Cell-mediated: cells and effector mechanisms in cellular cytotoxicity and granuloma formation
   E. Mucosal immunity: interactions between gut and bronchus-associated lymphoid tissue and secretory IgA
   F. Other: natural killers, lymphokine-activated killer, graft versus host reaction

5. Immunoregulation
   A. Tolerance: clonal selection, deletion, anergy, and antigen paralysis
   B. Cell-cell interactions: help and suppression. Understand the collaboration among cells for control of the immune response
   C. Idiotype networks: inhibition and stimulation
   D. Cytokines
   E. Chemokines

C. Purine and uric acid metabolism

1. Purine: biochemistry, synthesis, and regulation
2. Uric acid: origin, elimination, and physicochemical properties
3. Crystals: factors affecting formation, induction of inflammation
4. Purine pathway enzyme deficiencies and immunodeficiency: (ADA, PNP)

D. Laboratory and diagnostic tests

1. Laboratory tests: for each test, understand the biology and principles/methodology of the laboratory techniques
   A. Erythrocyte sedimentation rate, C-reactive protein, and acute phase reactants
B. Rheumatoid factor and Anti-CCP
C. Antinuclear/anticytoplasmic antibodies: screening test, specific autoantibody tests, and LE cell preparation
D. Antineutrophil antibodies: membrane and cytoplasmic
E. Antiphospholipid antibodies including RPR, lupus anticoagulant, and anticardiolipin antibodies
F. Others: total serum complement activity, complement proteins, histocompatibility markers, cryoglobulins, immunoglobulin levels

2. Synovial fluid analysis: cell count and differential, crystal identification, viscosity, and other special stains/analyses

3. Radiographic imaging and other diagnostic procedures: understand principles and methodology of the following tests:
   A. Plain radiographs of bone and joints
   B. Bone densitometry
   C. Nuclear medicine scintigraphy
   D. Ultrasonography and arthrography
   E. Computed tomography
   F. Magnetic resonance imaging
   G. Electromyography and nerve conduction velocities

4. Test-performance characteristics: principles of sensitivity, specificity and predictive value

E. Biomechanics of bones, joints, and muscles: understand the principles of kinesiology of peripheral/axial joints and gait and how alterations in biomechanics contribute to musculoskeletal disorders

F. Research principles in basic and clinical investigation

1. Principles of epidemiology and health services research
2. Design of experimental protocols, clinical trials, and outcomes research
3. Laboratory techniques
   A. Serologic: ELISA, RIA, RID, nephelometry, immunoblots, protein electrophoresis, circulating immune complex assays.
   B. Cellular: lymphocyte proliferation, flow cytometry.
   C. Histochemistry and immunofluorescence of biopsied tissues.
   D. Molecular: Northern, Southern, Western, polymerase chain reaction, genetic mapping techniques, gene sequencing
   E. Hybridoma and monoclonal antibody production
F. Transgenic and gene knock-out animals
G. Principles of gene therapy

4. Data analysis, biostatistics, meta-analysis and medical informatics

5. Health status, disease activity, accumulated damage, functional, and quality of life measurements/assessments

6. Bioethics of basic research and clinical trials

7. Critical literature review

II. Clinical Sciences

A. Rheumatic Diseases

1. Systemic connective tissue diseases: rheumatoid arthritis, lupus erythematosus (systemic, discoid, and drug-related), scleroderma (localized syndromes, systemic sclerosis, CREST variant, chemical/drug-related), eosinophilic fasciitis, eosinophilic myalgic syndrome, Sjögren’s syndrome, polymyositis and dermatomyositis, overlap syndromes including mixed connective tissue disease, polymyalgia rheumatica, relapsing polyvchondritis, relapsing panniculitis, erythema nodosum, adult-onset Still’s disease, primary antiphospholipid antibody syndrome, undifferentiated connective tissue disease.

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, and undifferentiated spondyloarthropathies

3. Vasculitides: temporal arteritis, Takayasu’s arteritis, polyarteritis nodosa and systemic necrotizing vasculitis overlaps, allergic granulomatosis of Churg-Strauss, Wegener’s granulomatosis and other ANCA-associated diseases, Behcet’s disease, hypersensitivity and small vessel angiitis, cryoglobulinemia, Cogan’s syndrome

4. Pediatric rheumatic diseases: diseases occurring primarily in childhood (e.g., juvenile idiopathic arthritis, Kawasaki’s disease and infantile PAN, neonatal lupus syndrome, juvenile dermatomyositis, acute rheumatic fever, and others) and diseases which occur primarily in adults but can occur in childhood (e.g., SLE, systemic sclerosis, others)
5. Infectious and reactive arthritides
   A. Infectious arthritides: bacterial (nongonococcal and gonococcal), mycobacterial, spirochetal (syphilis, Lyme), viral (HIV, hepatitis B, parvovirus, other), fungal, parasitic
   B. Whipple’s disease
   C. Reactive arthritides: acute rheumatic fever, postimmunization arthritis, arthritis associated with subacute bacterial endocarditis, intestinal bypass arthritis, post-dysenteric arthritides, other colitic-associated arthropathies

6. Metabolic, endocrine, and hematologic disease associated rheumatic disorders
   A. Crystal - associated diseases: monosodium urate monohydrate (gout), calcium pyrophosphate dihydrate deposition disease, basic calcium phosphate (hydroxyapatite), calcium oxalate
   B. Endocrine - associated diseases: rheumatic syndromes associated with diabetes mellitus, acromegaly, hyperparathyroidism, hypoparathyroidism, hyperthyroidism, hypothyroidism, Cushing’s disease
   C. Hematologic - associated diseases: rheumatic syndromes associated with hemophilia, hemoglobinopathies, angioimmunoblastic lymphadenopathy

7. Bone and cartilage disorders
   A. Osteoarthritis - primary and secondary osteoarthritis, chondromalacia patellae
   B. Metabolic bone disease: osteoporosis, osteomalacia, bone disease related to renal disease
   C. Paget’s disease of bone
   D. Avascular necrosis of bone: idiopathic, secondary causes, osteochondritis dissecans
   E. Others: transient osteoporosis, hypertrophic osteoarthropathy, diffuse idiopathic skeletal hyperostosis, insufficiency fractures

8. Hereditary, congenital, and inborn errors of metabolism associated with rheumatic syndromes
   A. Disorders of connective tissue: Marfan’s syndrome, osteogenesis imperfecta, Ehlers- Danlos syndromes, pseudoxanthoma elasticum, hypermobility syndrome
   B. Mucopolysaccharidoses
   C. Osteochondrodysplasias: multiple epiphyseal dysplasia, spondyloepiphyseal dysplasia
D. Inborn errors of metabolism affecting connective tissue: homocystinuria, ochronosis

E. Storage disorders: Gaucher’s disease, Fabry’s disease, Farber’s lipogranulomatosis

F. Immunodeficiency: IgA deficiency, complement component deficiency, SCID and ADA deficiency, PNP deficiency

G. Others: hemachromatosis, familial Mediterranean fever, hyperlipidemic arthropathy, myositis ossificans progressiva, Wilson’s disease

9. Nonarticular and regional musculoskeletal disorders
   A. Fibromyalgia
   B. Psychogenic rheumatism
   C. Axial syndromes: low back pain, spinal stenosis, intervertebral disc disease and radiculopathies, cervical pain syndromes, coccydynia, osteitis condensans ilii, osteitis pubis, spondylolisthesis/spondylosis, discitis
   D. Regional musculoskeletal illnesses: in addition to bursitis, tendinitis, or enthesitis occurring around each joint, the trainee should be familiar with other disorders occurring at each specific joint site (e.g., shoulder-rotator cuff tear, adhesive capsulitis, impingement syndrome; wrist ganglions; trigger fingers and Dupuytren’s contractures; knee synovial plicaes, internal derangements, cysts; hallux rigidus, heel pain, and metatarsalgia; TMJ syndromes; costochondritis
   E. Biomechanical/anatomic abnormalities associated with regional pain syndromes: scoliosis and kyphosis, leg length discrepancy, foot deformities
   F. Overuse rheumatic syndromes: occupational, sports, recreational, performing artists
   G. Sports medicine: injuries, strains, sprains, nutrition, female athlete, medication issues
   H. Entrapment neuropathies: thoracic outlet syndrome, upper extremity entrapments, lower extremity entrapments
   I. Other: reflex sympathetic dystrophy (complex regional pain syndrome)

10. Neoplasms and tumor-like lesions
    A. Benign
        (1) Joints: loose bodies, fatty and vascular lesions, synovial osteochondromatosis, pigmented villonodular synovitis, ganglions
        (2) Tendon sheaths: fibroma, giant cell tumor, nodular tenosynovitis
(3) Bone: osteoid osteoma, others

B. Malignant
(1) Primary: synovial sarcoma, others
(2) Secondary: leukemia, myeloma, metastatic malignant tumors
(3) Malignancy-associated rheumatic syndromes: carcinomatous polyarthritis, palmoplantar fasciitis, Sweet’s syndrome

11. Muscle diseases
A. Inflammatory: polymyositis, dermatomyositis, inclusion body myositis
B. Metabolic
(1) Primary: glycogen storage diseases, lipid metabolic disorders, myoadenylate deaminase deficiency, mitochondrial myopathies
(2) Secondary: nutritional, toxic, endocrine disorders, electrolyte disorders, drug-induced
C. Muscular dystrophies
D. Myasthenia gravis

12. Miscellaneous rheumatic disorders
A. Amyloidosis: primary, secondary, hereditary
B. Raynaud’s disease
C. Charcot joint
D. Remitting seronegative symmetrical synovitis with pitting edema
E. Multicentric reticulohistiocytosis
F. Plant thorn synovitis
G. Intermittent arthritides: palindromic rheumatism, intermittent hydrarthrosis
h. Arthritic and rheumatic syndromes associated with: sarcoidosis, scurvy, pancreatic disease, chronic active hepatitis, primary biliary cirrhosis, drugs, and environmental agents
i. Rheumatic disease in the geriatric population
j. Rheumatic disease in the pregnant patient
k. Rheumatic syndromes in dialysis patients

B. Clinical and technical skills

1. Rheumatologic history: understand principles and demonstrate competency in obtaining a clinical history, relevant review of systems, and functional status of patients with rheumatic disease symptoms.
2. Physical examination: understand principles and 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 trainee should be able to identify extra-articular findings that are associated with specific rheumatic diseases.

3. Diagnostic testings and procedures
   A. Arthrocentesis: understand the anatomy, precautions including a local standard, and potential sequelae of arthrocentesis and demonstrate competency in obtaining synovial fluid from diarthroidal joints, bursae, and tenosynovial structures.
   B. Synovial fluid analysis: understand the principles and interpretation of results of synovial fluid analyses and demonstrate competency in the analysis of synovial fluid by light and polarized microscopy from patients with a variety of rheumatic disorders.
   C. Interpretation of results of specific laboratory tests (including but not limited to): sedimentation rate, C-reactive protein and other acute phase reactants, iron studies including ferritin, rheumatoid factor, antinuclear antibodies, anti ds DNA, anti SS-A/Ro, anti SS-B/La, anti Ul RNP, anti Sm, antiribosomal P, anticentromere, antitopoisomerase 1, anti-Jo-1, anti PM-Scl, antineutrophil cytoplasmic antibodies, cryoglobulins, complement component levels, CH50, serum protein electrophoresis, serum immunoglobulin levels, LE cell preparation, RPR, lupus anticoagulant, anticardiolipin antibodies, HLA typing (e.g., HLA B27), antihistone antibodies, ASO and other streptococcal antibody tests, Lyme serologies, serum and urine uric acid levels, circulating immune complexes, lymphocyte subset and function data, anticellular antibodies (e.g., Coombs, neutrophils, platelets).
   D. Plain radiographs: demonstrate understanding and competency in the assessment of radiographs of normal and diseased joints, bones, periarticular structures, and prosthetic joints.
   E. Demonstrate competency in the interpretation of results from the following tests in patients with rheumatic diseases (trainees may develop skill in the performance of some of these tests):
      (1) Diagnostic imaging techniques: arthrography, ultrasonography, computed tomography, magnetic
(2) Radionuclide scanning techniques: joint and bone scans, parotid scans and salivary flow studies, bone densitometry
(3) Arteriograms/MR angiograms/ CT Angiograms in the vasculitides
(4) Electromyograms and nerve conduction studies
(5) Biopsy specimens including histochemistry and immunofluorescence of tissues relevant to the diagnosis of rheumatic diseases: skin, synovium, muscle, nerve, bone (e.g., metabolic bone disease), minor salivary gland, artery, kidney, and lung
(6) Others: nailfold capillary examination, ischemic forearm muscle test, Schirmer’s and rose bengal tests, closed needle synovial biopsy, and arthroscopy.

4. Demonstrate the ability to construct a differential diagnosis in patients presenting with signs and symptoms related to rheumatologic diseases and to outline further testing necessary to establish the correct diagnosis.

5. Using the basic principles of decision analysis, understand the indications for and costs of ordering laboratory tests and procedures to establish a diagnosis of a rheumatologic disease.

C. Therapeutic modalities and strategies

1. Therapeutic aspiration and injection: understand the anatomy, precautions, and potential sequelae of and demonstrate competency in therapeutic aspiration and/or injection of diarthrodial joints, bursae, tenosynovial structures, and entheses.

2. Pharmacology: for each medication, 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 and children.

   A. Nonsteroidal anti-inflammatory drugs and selective cyclooxygenase inhibitors (Coxibs)
   B. Glucocorticoids: topical, intraarticular, systemic
   C. Systemic antirheumatic drugs: antimalarials, sulfasalazine, methotrexate, leflunomide, gold compounds, D-penicillamine,
D. Cytotoxic drugs: azathioprine, cyclophosphamide, chlorambucil, Mycophenolate mofetil
E. Immunomodulators: cyclosporine, biologic response modifiers, intravenous immunoglobulin therapies
F. Hypouricemic drugs: allopurinol, sulfinpyrazone, probenecid, benzbromarone, and new hypouricemic drugs e.g. febuxostat
G. Antibiotic therapy for septic joints
H. Narcotic and non-narcotic analgesics
I. Others: apheresis, ionizing radiation

3. Rehabilitation, disability, and pain management issues
A. Multidisciplinary team concept: Understand the rheumatologist’s role as well as when to consult other health professionals (nurse practitioner, visiting nurse, physical therapist, occupational therapist, podiatrist, social worker, vocational rehabilitation counselor, psychologist, psychiatrist) in the outpatient and inpatient rehabilitation of patients with rheumatic diseases.

B. Demonstrate the ability to identify physical impairment; relate the impairment to the observed functional deficits; prescribe appropriate rehabilitation to achieve goals to improve the defined impairment.

C. Methods of rehabilitation: for each method, understand principles, mechanism of action, indications, precautions and contraindications, potential side effects, and costs.
   (1) Exercise: range of motion, strengthening, conditioning, and stretching
   (2) Rest and splinting
   (3) Modalities and hydrotherapy: ultrasound, iontophoresis, spa therapy
   (4) Joint protection and energy conservation techniques
   (5) Adaptive equipment and assistive devices
   (6) Job site/home evaluation and adaptation
   (7) Footwear and orthotics
   (8) Others: acupuncture, TENS unit, pain clinics, traction
   (9) Nutritional issues

D. Demonstrate understanding of specific rehabilitative techniques/modalities and what modification of these techniques are needed depending on the patient’s disease (e.g. osteoarthritis, myositis), location of symptoms (e.g. back, shoulder) and other related issues.
E. Psychosocial aspects: understand the impact that the following factors have on the overall therapy of a patient with rheumatic disease and demonstrate knowledge of what can be done to assist a patient in these areas.
(1) Psychologic and emotional factors including sexuality
(2) Economic and vocational issues: vocational rehabilitation, costs of therapy and monitoring
(3) Disability determination: impairment vs disability, evaluation and measurement
(4) Compliance issues

F. Rehabilitation of the rheumatic disease patient after a surgical or orthopedic procedure.

4. Surgical management

A. Understand indications for surgical and orthopedic consultation in acute and chronic rheumatic diseases.

B. For each procedure, the trainee should possess a working knowledge of indications, preoperative evaluation and medication adjustments, contraindications, complications, postoperative management, and expected outcome.
(1) Bone biopsy
(2) Arthroscopy
(3) Synovectomy of tendons and joints
(4) Entrapment neuropathy release
(5) Osteotomies: hip, knee
(6) Arthrodesis: wrist, other
(7) Spine surgery: radiculopathy, stenosis, and instability
(8) Reconstructive surgery of hand and foot
(9) Total joint replacement: hip, knee, shoulder, other
(10) Specific surgical management problems:
(A) Pediatric rheumatic disease patient
(B) Infected joint: arthroscopy vs. arthrotomy
(C) Infected prosthetic joint
(D) Ankylosing spondylitis patient
(E) Prevention and treatment of deep venous thrombosis
(F) Rheumatoid arthritis patient
5. Unconventional medical practices: diet, nutritional supplements, antimicrobials, acupuncture, topicals, homeopathic remedies, venoms etc.

6. Using the basic principles of decision analysis, understand the indications for and cost of different therapies used in the management of rheumatic diseases

III. Professional Knowledge
   A. Teaching and presentation skills
      1. Teaching skills: understand principles of effective teaching and their application with respect to learning objectives, format (e.g., lecture, group discussion), and assessment.
      2. Presentation skills: poster, podium, computer-based, carousel and overhead projector slides, other.
      3. Patient Education

   B. Writing skills: be able to write patient consultation medical reports and understand principles of how to write grants and manuscripts.

   C. Practice management: be familiar with types of practice, equipment, insurance, economics, personnel, quality assurance, and managed care issues relating to the practice of rheumatology. It is very important for the trainee to understand and practice good clinical ethics.

   D. The trainee should be familiar with the history of rheumatology and the development of rheumatology in Singapore.

   E. The trainee should be familiar with research and research ethics.
Special Areas of Training

1. Communicator

General Requirements
a) Establish trusting relationships with patients and families.
b) Obtain and synthesize relevant history from patients, families and their communities.
c) Listen effectively.
d) Discuss appropriate information with patients and families and the health care team.

Specific Requirements
To provide the best possible care the Rheumatologist must establish effective relationships with patients, families, other physicians and other health care professionals. Communication skills are essential to obtain a history from and convey information to patients and families and to establish a relationship characterized by trust, understanding and compassion.

The advanced trainee should demonstrate the ability to:
a) Listen carefully, obtain and synthesize relevant history from patients and families.
b) Present relevant information clearly, concisely and accurately, in written and verbal format and maintain appropriate records.
c) Educate patients, families and other health care professionals in formal and informal settings with regard to the patient’s condition, management, risk factors and secondary prevention.
d) Demonstrate caring, empathy, understanding and confidentiality.
e) Understand the impact of such factors as age, gender, disability, ethnic and cultural background and socio-economic background on the patient’s history, relationships and ability to comply with a therapeutic program.
f) Identify and discuss end-of-life issues with the patient and family, demonstrating compassion, respect and understanding.

2. Collaborator

General Requirements
a) Consult effectively with other Rheumatologists in Singapore.
b) Consult effectively with other physicians and health care professionals
c) Contribute effectively to other interdisciplinary team activities

Specific Requirements
The Rheumatology trainee is encouraged to join the Rheumatology fraternity and participate in the activities of rheumatology/immunology related scientific
organisations in Singapore (see Appendix II for list of rheumatology/immunology organisations).

The Rheumatology trainee will also be considered a temporary associate member of the Chapter of Rheumatology of the College of Physicians, Academy of Medicine (Singapore). He / she will be invited to attend and participate in the scientific activities of the Chapter.

Rheumatologists work in partnership with other health care professionals involved in the care of their patients. It is essential for a Rheumatologist to collaborate effectively with a multidisciplinary team of health care workers including the Orthopaedic Surgeon, the Physiotherapist, the Pharmacist, the Nurse Educator and the Medical Social Worker. In addition, since many rheumatic diseases affect other organ systems, the Rheumatologist must work well with other specialists like the Intensive Care Physician, Respiratory Physician, Gastroenterologist, Cardiologist, Nephrologist, Neurologist, Ophthalmologist, ENT Specialist, etc.

The advanced trainee should demonstrate the ability to:

a) Consult with other Rheumatologists, physicians and health care professionals, and to understand their roles and contributions.

b) Contribute effectively and constructively to multidisciplinary team activities, contribute to team development, and recognize areas of expertise and value opinions of other team members.

3. Manager

General Requirements
a) Utilize resources effectively to balance patient care, learning needs and outside resources.

b) Allocate finite health care resources wisely.

c) Work effectively and efficiently in a health care organization.

d) Utilize information technology to optimize patient care, life-long learning and other activities.

Specific Requirements
Rheumatologists function as manager when they make practical decisions involving co-workers, resources and policies. Rheumatologists must prioritise and execute tasks, work effectively with colleagues and make appropriate decisions regarding all health care resources. Rheumatologists frequently assume positions of leadership in the health care system.

The advanced trainee should:

a) Practice time management skills including punctuality, planning, prioritization and triage skills.
b) Understand the advantages and disadvantages of health care in a variety of settings, including hospitals, ambulatory care clinics, offices, homecare and chronic care and rehabilitation facilities.

c) Understand the cost and cost-effectiveness of therapeutic and preventive health programs, and the ability to make appropriate decisions based on evidence of benefit to the patient and population served.

d) Understand quality assurance and quality improvement programs and participate in such programs in their areas of responsibility.

e) Use information technology as an important tool in patient management.

f) Organize and coordinate the work of the health care team as the patient’s most responsible physician.

4. **Health Advocate**

General Requirements

a) Identify the important determinants of health affecting patients.

b) Contribute effectively to improved health of patients and communities.

c) Recognize and respond to those issues where advocacy is appropriate.

Specific Requirements

Rheumatologists have an important role in advocating health promotion for individual patients, their practice populations, and the broader community.

The Rheumatology trainee is encouraged to give public lectures to educate the patients and the public on various rheumatic diseases. In addition he / she should support the activities or even stand for office in the executive committees of related lay organisations (see Appendix I for list of relevant organisations).

The advanced trainee should:

a) Be able to identify the biologic, psychosocial, environmental, and economic determinants of health, utilize this information in a management and prevention plan, and ensure that the patient accesses appropriate health and social services in the management of individual patients.

b) Be able to identify patient groups at risk of rheumatic disease and their complications within a practice population and apply knowledge regarding primary and secondary prevention.

5. **Scholar**

General Requirements

a) Implement and monitor a personal continuing medical education program.

b) Critically appraise sources of medical information.

c) Facilitate learning of patients, junior doctors / students and other healthcare professionals.

d) Contribute to development of new knowledge by participating in research.
Specific Requirements
Rheumatologists undertake a lifelong pursuit of the mastery of Rheumatology and have the responsibility for ongoing self-directed learning. They contribute to the education of students (medical and nursing), patients and colleagues as well as to research, its appraisal and application.

The advanced trainee should:
  a) Be able to develop and utilize a self-directed continuing education strategy.
  b) Know and be able to apply the principles of critical appraisal to sources of medical information.
  c) Know and apply the evidence-based standards of care to Rheumatic diseases.
  d) Understand the importance of ongoing research in Rheumatic disease, participate and contribute to clinical and/or basic research, and demonstrate a questioning and inquisitive approach to medical information.
  e) Contribute to the education of students, patients and other health professionals.

6. Professional

General Requirements
  a) Deliver highest quality care with integrity, honesty and compassion.
  b) Exhibit appropriate personal and interpersonal professional behavior.
  c) Practice medicine ethically in consistence with the obligations of a physician.

Specific Requirements
Rheumatologists have a unique role in society as professionals dedicated to improving the health of rheumatology patients in their communities. Rheumatologists are committed to the highest standards of excellence in clinical care and ethical conduct, and are committed to acting with integrity, honesty and compassion.

The advanced Rheumatology trainee
  a) Understand and apply the basic principles of medical ethics including: informed consent, advanced medical directives and research ethics.
  b) Understand the nature of professional interpersonal relationships and boundaries with patients, co-workers, and students.
  c) Understand legal and professional obligations that apply to Rheumatology including preparation of timely and accurate medico-legal reports, responses to regulatory bodies, notification of coroners, and Good Clinical Practice Guidelines in the conduct of clinical trials.
Assessment of Advanced trainees in Rheumatology

(See paper on Exit Examination)

Specialist Accreditation of Advanced Trainees with the Ministry of Health

Having satisfied the panel of examiners appointed by the Specialist Training Committee (Rheumatology); candidates will be informed in writing by the Academy of Medicine of their success within 2 weeks of the exit examination. The candidate will then proceed to apply for Specialist Accreditation with the Ministry of Health with the letter from Academy of Medicine substantiating his/her successful completion of Advanced Training.

Registration of Rheumatologists Trained Overseas

For registration of Rheumatologists trained overseas, the STC has recommended that only

(1) Those who are certified by the American Board of Rheumatology
(2) Those with FRACP and sub-specialty training in Rheumatology
(3) Those who are certified by the Joint Committee in Specialist Training in Rheumatology from the United Kingdom,

be registered as specialists by the Accreditation Board for Specialists of MOH.

These Rheumatologists may be required to submit letters of reference from previous employers and/or programme directors. They may be subjected required to attend an interview with the STC. Rheumatologists trained elsewhere will be assessed on a case-by-case basis.

1st Draft, January 2005 (prepared by the Rheumatology STC)
Revised, March 2005
Further revisions, May 2005
Final Draft (after consultation with the Chapter of Rheumatologists, College of Physicians, Singapore and heads of the departments/divisions of rheumatology), Jan 2006
Appendix I

List of Fully Accredited Training Departments for Rheumatology

1) SGH Department of Rheumatology and Immunology
2) TTSH Department of Rheumatology, Allergy and Immunology

Appendix II

A. Local rheumatology-related scientific organizations

- Chapter of Rheumatologists, College of Physicians, Academy of Medicine (Singapore)
- Singapore Society of Rheumatology

B. Local rheumatology-related lay organizations

- Lupus Association (Singapore)
- National Arthritis Foundation, and affiliated clubs (Ankylosing Spondylitis Club, Juvenile Arthritis Club, Juvenile Lupus Club)
- Osteoporosis Society
- Rheumatoid Arthritis Society