The Royal Australasian College of Physicians

# Rheumatology

## Advanced Training Curriculum

*Paediatrics & Child Health Division*

Australian Rheumatology Association

The Royal Australasian College of Physicians

# Physician Readiness for Expert Practice (PREP) Training Program

## Paediatric Rheumatology Advanced Training Curriculum

TO BE USED IN CONJUNCTION WITH:

**Basic Training Curriculum – Paediatrics & Child Health**

**Professional Qualities Curriculum**

# ACKNOWLEDGEMENTS

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The following Fellows and trainees, in particular, deserve specific mention for their contribution:

- Dr Kevin Murray, FRACP
- A/Prof Sue Piper, FRACP
- The members of the Australian and New Zealand Paediatric Rheumatology Group who reviewed and contributed to the writing of this document
- The members of the Rheumatology Specialty Training Committee (STC) who reviewed the document

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The process was managed by the Curriculum Development Unit within the College's Education Deanery, who designed the document, drafted content material, organised and facilitated writing workshops, developed resource materials, and formatted the final document.

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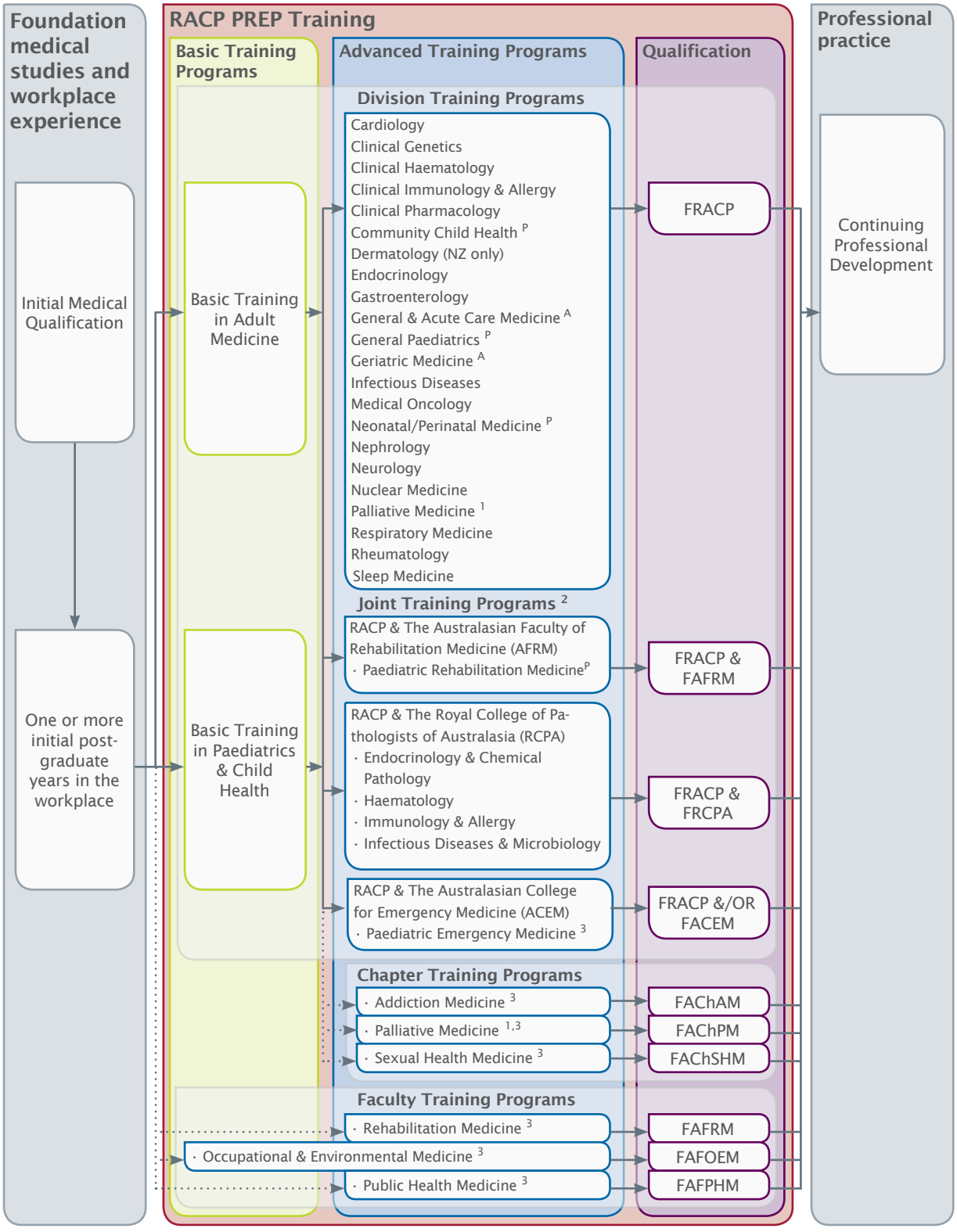
Please note: No Domains, Themes or Learning Objectives have been updated for this edition; design changes ONLY.

## RACP FELLOWSHIP TRAINING PATHWAYS AND THE CONTINUUM OF LEARNING




P Trainees must complete Basic Training in Paediatrics & Child Health to enter this program.
A Trainees must complete Basic Training in Adult Medicine to enter this program.
1 Trainees who have entered Advanced Training in Palliative Medicine via a RACP Basic Training Program will be awarded FRACP upon completion and may subsequently be awarded FAChPM. Trainees who have NOT entered Advanced Training in Palliative Medicine via a RACP Basic Training Program will only be awarded FAChPM upon completion.
2 The Child & Adolescent Psychiatry Joint Training Program with the Royal Australian and New Zealand College of Psychiatrists (RANZCP) is currently under review by the RACP and RANZCP and closed to new entrants at present.
3 Alternative entry requirements exist for these training programs; please see the corresponding PREP Program Requirements Handbook for further information.

NB1: This diagram only depicts training programs that lead to Fellowship. Please see the RACP website for additional RACP training programs.
NB2: For further information on any of the above listed training programs, please see the corresponding PREP Program Requirements Handbook.

## OVERVIEW OF THE SPECIALTY

Paediatric rheumatologists are specialist paediatricians with particular expertise in the diagnosis and wholistic management of children and adolescents with diseases that affect joints, muscles, and bones. They specialise in caring for patients with rheumatic disorders[1]. Key aspects of their clinical practice are the management of pain, the reduction of inflammation, and preservation of musculoskeletal function.

It is possible to practice rheumatology in a variety of settings in Australia and New Zealand. Some practise 'pure' rheumatology in private practice, at public hospitals, or in conjunction with academic or research posts. Others combine rheumatology expertise with related clinical expertise, for example, paediatric medicine, immunology/allergy, pain medicine, or sports medicine. In all settings there is an increasing trend towards ambulatory care based treatment.

Rheumatologists are committed to the expansion of knowledge within their field. As such they are often actively engaged in research across a wide breadth of investigational opportunities.

In the context of a rapidly growing population, there is recognition of an increasing need for rheumatology specialist services. Many patients with chronic rheumatic diseases and their families have a decreased capacity to engage in physical activities and schooling, affecting future employment. Parents face social and financial difficulty leading to decreased capacity to engage with the wider community and maintain employment. This often has a profound personal impact on the patient and their families and has broad implications for society and government. Arthritis has been identified as a national health priority in Australia.

Earlier diagnosis and aggressive treatment of inflammatory arthritis in childhood can prevent long-term pain and disability. Early accurate diagnosis has been facilitated by advances in imaging techniques, such as musculoskeletal ultrasound and MRI. With the availability of conventional disease modifying treatments, like methotrexate, as well as newer biological agents such as tumour necrosis factor (TNF)-blockers, excellent outcomes for children with newly diagnosed inflammatory arthritis are now a realistic expectation.

Rheumatic diseases are frequently chronic. Due to the longitudinal nature of care, skilful communication engendering lasting rapport with patients and their families remains an enduring, critical facet of rheumatology practice. However, progress in understanding disease process has lead to exciting advances, such as the greatly improved management options for inflammatory arthritis. This sort of advance drives changes in clinical practice, and reinforces the importance of each paediatric rheumatologist being an engaged learner throughout their professional career.

## CURRICULUM OVERVIEW

### Paediatric Rheumatology – Advanced Training Curriculum

This curriculum outlines the broad concepts, related learning objectives and the associated theoretical knowledge, clinical skills, attitudes and behaviours required and commonly used by paediatric rheumatologists within Australia and New Zealand.

The purpose of Advanced Training is for trainees to build on the cognitive and practical skills acquired during Basic Training in paediatrics. At the completion of the Paediatric Rheumatology Advanced Training Program, trainees should be competent to provide, at consultant level, unsupervised comprehensive medical care in rheumatology.

Attaining competency in all aspects of this curriculum is expected to take three years of training. It is expected that all teaching, learning and assessment associated with the Paediatric Rheumatology Advanced Training Curriculum will be undertaken within the context of the paediatrician's everyday clinical practice and will accommodate discipline-specific contexts and practices as required. As such it will need to be implemented within the reality of current workplace and workforce issues and the needs of health service provision.

[1]In this curriculum rheumatic disorders refer to all forms of arthritis; autoimmune connective tissue disease; spinal and soft tissue disorders; certain metabolic bone disorders, such as osteoporosis; and chronic musculoskeletal pain syndromes. An extensive list of conditions considered rheumatic disorders of childhood for this curriculum is appended.

There may be learning objectives that overlap with or could easily relate to other domains; however, to avoid repetition, these have been assigned to only one area. In practice it is anticipated that within the teaching/learning environment, the progression of each objective would be explored.

Note: The curricula should always be read in conjunction with the relevant College Training Handbook available on the College website.

## Who is this curriculum designed for?

This document is principally designed for paediatric rheumatology Advanced Trainees as a guide to their specialty specific learning objectives and assessment. It is intended that supervisors of training will also be very familiar with this document, as well as the members of the relevant Rheumatology Association Committees.

The curriculum will be used at several levels of program development: individual trainees should use the document to help develop their own personal learning plans and to negotiate learning plans with their supervisors; departments should use the curriculum to plan learning and assessment activities for their Advanced Trainees; the document should also inform organisers of state and national level rheumatology training activities.

Fellows of the College may be interested in the document as an indication of the standards that are applied to current trainees, and as a guide to their own CPD. Prospective trainees, accrediting and employing bodies and members of the community may be interested in what rheumatologists consider their specific domains of expertise.

The document acknowledges some excellent rheumatology training curricula employed by other training and accreditation bodies internationally. While this document has been developed for the local context, it may be of use when considering accreditation of training for physicians that cross jurisdictions.

## Professional Qualities Curriculum

The Professional Qualities Curriculum (PQC) outlines the range of concepts and specific learning objectives required and used by all physicians and paediatricians, regardless of their specialty or area of expertise. It spans both the Basic and Advanced Training Programs and is also used as a key component of the CPD program.

Together with the various Basic and Advanced Training Curricula, the PQC integrates and fully encompasses the diagnostic, clinical, and educative-based aspects of the physician's/paediatrician's daily practice.

Each of the concepts and objectives within the PQC will be taught, learnt and assessed within the context of everyday clinical practice. Thus it is important that they be aligned with, and fully integrated into, the learning objectives within this curriculum.

## EXPECTED OUTCOMES AT THE COMPLETION OF TRAINING

Graduates from this training program will be equipped to function effectively as a paediatric rheumatology specialist within the current and emerging professional, medical, and societal contexts.

At the completion of their overall training program, it is expected that a new Fellow will:

- have a sound knowledge of the epidemiology and socio-economic impact of paediatric rheumatic disorders
- have a thorough understanding of basic and applied medical sciences relevant to paediatric rheumatic disorders, including morbid anatomy, pathophysiology, chemical pathology, immunology, and microbiology
- have a thorough understanding of the classification, clinical features, laboratory findings, pathophysiology, physical, and psychosocial impact of rheumatic disorders
- be expert in the wholistic assessment and management of children with rheumatic disorders, including cognitive, behavioural, and biopsychosocial components
- be expert in the pharmacotherapy of rheumatic disorders, including the use of analgesic, steroidal and non-steroidal anti-inflammatory, conventional and biologic disease modifying and immunosuppressive drugs, with knowledge of their adverse effects and toxicity monitoring procedures
- be competent in the use of appropriate diagnostic and therapeutic procedures, including joint and soft tissue injection and aspiration, and synovial fluid examination
- have training in research techniques, statistical methods, and in critical evaluation of the medical literature
- promote research in rheumatology by supporting or participating in research activities
- contribute to the education of colleagues, junior medical officers, students, other health care workers, and the public
- maintain excellence personally and within the field of rheumatology by actively participating in CPD and quality assurance activities
- have an understanding of aspects of the specialty of paediatric rheumatology necessary for a physician predominantly treating adult patients. This includes the scope of rheumatic disease in children and transitional care in adolescents.

## CURRICULUM THEMES AND LEARNING OBJECTIVES

This specialty curriculum builds on the Basic Training Curriculum and those competencies therein are assumed. The Professional Qualities Curriculum maintains relevance through Basic and Advanced Training by staging the introduction of advanced competencies. These are considered integral to Paediatric Rheumatology Advanced Training and will be assessed.

The domains and themes from the PQC are reproduced here for reference:

| | |
|---|---|
| **Domain 1** | **Communication** |
| Theme 1.1 | Physician–Patient Communication |
| Theme 1.2 | Communicating with a Patient's Family and/or Carers |
| Theme 1.3 | Communicating with Colleagues And Broader Health Care Team |
| Theme 1.4 | Communicating with The Broader Community |
| **Domain 2** | **Quality and Safety** |
| Theme 2.1 | Using Evidence and Information |
| Theme 2.2 | Safe Practice |
| Theme 2.3 | Identifying, Preventing and Managing Potential Harm |
| **Domain 3** | **Teaching and Learning (Scholar)** |
| Theme 3.1 | Ongoing Learning |
| Theme 3.2 | Research |
| Theme 3.3 | Educator |
| **Domain 4** | **Cultural Competency** |
| Theme 4.1 | Cultural Competency |
| **Domain 5** | **Ethics** |
| Theme 5.1 | Professional Ethics |
| Theme 5.2 | Personal Ethics |
| Theme 5.3 | Ethics and Health Law |
| **Domain 6** | **Clinical Decision Making** |
| Theme 6.1 | Clinical Decision Making |

| | |
|---|---|
| **Domain 7** | **Leadership and Management** |
| Theme 7.1 | Self-Management |
| Theme 7.2 | Leadership and Managing Others |
| **Domain 8** | **Health Advocacy** |
| Theme 8.1 | Advocacy for the Patient |
| Theme 8.2 | Individual Advocacy |
| Theme 8.3 | Group Advocacy |
| **Domain 9** | **The Broader Context of Health** |
| Theme 9.1 | Burden of Disease |
| Theme 9.2 | Determinants of Health |
| Theme 9.3 | Prevention and Control |
| Theme 9.4 | Priority Population Groups |
| Theme 9.5 | Economics of Health |

Each of the curriculum documents has been developed using a common format, thereby ensuring a degree of consistency and approach across the spectrum of training.

## Domains

The domains are the broad fields which group common or related areas of learning.

## Themes

The themes identify and link more specific aspects of learning into logical or related groups.

## Learning Objectives

The learning objectives outline the specific requirements of learning. They provide a focus for identifying and detailing the required knowledge, skills, and attitudes. They also provide a context for specifying assessment standards and criteria as well as providing a context for identifying a range of teaching and learning strategies.

## PAEDIATRIC RHEUMATOLOGY SPECIFIC LEARNING OBJECTIVES

Paediatricians have a unique role, with a distinct body of knowledge, skills, attitudes and behaviours which enable them to provide clinical care to the highest standards of excellence. Paediatric rheumatologists direct these fields of learning to the effective care of patients with rheumatic disorders. All paediatricians must apply effective forms of reasoning to make complex clinical decisions.

Their care is characterised by up-to-date, ethical, and resource efficient clinical practice as well as by effective communication in partnership with patients, other health care providers, and the community.

Domain 1 elaborates on Domain 6 of the PQC: Clinical Decision Making or 'Medical expert' as specifically required for Paediatric Rheumatology Advanced Training. Theme 1.1 is reproduced from Domain 6 of the PQC for reference. Themes 1.2 and 1.3 are unique to this curriculum.

For Paediatric Rheumatology Advanced Training, all themes and learning objectives of Domain 1 should be considered as relates to the investigations, procedures, and therapeutics in Domain 2 of the curriculum and the list of rheumatic disorders.

Where specific knowledge and/or skills require reinforcement, these are signposted by links from this specialist curriculum to relevant areas of the other curricula.

### LEARNING OBJECTIVES TABLES

| **DOMAIN 1** | **FUNDAMENTALS OF RHEUMATOLOGY PRACTICE** |
|---|---|
| **Theme 1.1** | Clinical Decision Making – (PCQ) |
| **Learning Objectives** | |
| **1.1.1** | Understand and apply the process of diagnostic reasoning |
| **1.1.2** | Prognosticate and articulate risk |
| **1.1.3** | Derive therapeutic decisions which maximise patient benefit and acceptance |
| **1.1.4** | Use evidence effectively and efficiently to inform clinical decision making |
| **Theme 1.2** | Diagnosis in Rheumatology |
| **Learning Objectives** | |
| **1.2.1** | Elicit medical history to diagnose accurately and manage appropriately paediatric patients with suspected or established rheumatic disorders |
| **1.2.2** | Examine the musculoskeletal and other systems to diagnose accurately and manage appropriately paediatric patients with suspected or established rheumatic disorders |
| **1.2.3** | Order and interpret relevant, cost-effective investigations to diagnose accurately and manage paediatric patients with suspected or established rheumatic disorders |

| | |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objectives** | |
| **1.3.1** | Prescribe and monitor pharmacological therapeutics in children with rheumatic disorders |
| **1.3.2** | Use core rheumatologic procedures in the management of paediatric patients with rheumatic disorders |
| **1.3.3** | Use and monitor non-pharmacological, non-surgical interventions in paediatric patients with rheumatic disorders |
| **1.3.4** | Collaborate with other medical services to appropriately manage paediatric patients with rheumatic disorders |
| **1.3.5** | Develop a treatment plan for and support the paediatric patient through the process of transition of care to the most appropriate adult rheumatology service |
| **1.3.6** | Appreciate the differences between paediatric and adult patients and the impact of rheumatic disease in childhood |
| **DOMAIN 2** | **KNOWLEDGE, SKILLS, AND ATTITUDES** |
| **Theme 2.1** | General Knowledge |
| **Learning Objectives** | |
| **2.1.1** | Demonstrate operational general knowledge as applied to musculoskeletal conditions |
| **Theme 2.2** | Basic Sciences |
| **Learning Objectives** | |
| **2.2.1** | Demonstrate operational knowledge of basic sciences as applied to musculoskeletal conditions |
| **Theme 2.3** | Clinical Sciences |
| **Learning Objectives** | |
| **2.3.1** | Demonstrate operational knowledge as applied to paediatric rheumatic disorders and related conditions |
| **2.3.2** | Assess and manage paediatric rheumatic disorders and related conditions |
| **2.3.3** | Demonstrate operational knowledge as applied to the investigation of musculoskeletal conditions |
| **Theme 2.4** | Therapeutics |
| **Learning Objectives** | |
| **2.4.1** | Therapeutic modalities and strategies |
| **2.4.2** | Physical therapy and rehabilitation |
| **2.4.3** | Prevention of musculoskeletal conditions |

| | |
|---|---|
| **2.4.4** | Appropriate use of and referral to multidisciplinary (therapy) services and pain services |
| **2.4.5** | Psychosocial aspects of disability |
| **2.4.6** | Surgical intervention |
| **2.4.7** | Complementary or unproven medicine |
| **Theme 2.5** | Clinical Skills |
| **Learning Objectives** | |
| **2.5.1** | Elicit a history |
| **2.5.2** | Perform physical examination |
| **2.5.3** | Use, apply, and interpret measures of disease activity, functional status, cumulative damage, and quality of life, that are appropriate for the child's condition |
| **2.5.4** | Elaborate an appropriate differential diagnosis and an investigational plan |
| **2.5.5** | Analyse and interpret clinical, laboratory, and imaging data |
| **2.5.6** | Develop an appropriate management plan |
| **2.5.7** | Recognise, assess and manage emergency rheumatological situations |
| **2.5.8** | Design an appropriate follow-up plan |
| **2.5.9** | Demonstrate effective, appropriate, and timely cooperation with other health professionals |
| **Theme 2.6** | Technical Skills |
| **Learning Objectives** | |
| **2.6.1** | Aspiration of joints and bursae |
| **2.6.2** | Injection of joints and soft tissue |
| **2.6.3** | Synovial fluid for infection or other disorder |
| **2.6.4** | Interpretation of musculoskeletal imaging, bone scintigraphy, and bone densitometry |
| **Theme 2.7** | Optional Skills |
| **Learning Objectives** | |
| **2.7.1** | Perform procedures considered optional |
| **Theme 2.8** | Attitudes |
| **Learning Objectives** | |
| **2.8.1** | Demonstrate effective behaviours to convey the highest standards of care for patients and families, and make valuable contributions to the professional development of self and others |

| LEARNING OBJECTIVE TABLES | |
|---|---|
| **PQC** | Professional Qualities Curriculum |
| **BTC** | Basic Training Curriculum |
| Knowledge and skill competencies are referenced to Domain 2 of the Paediatric Rheumatology Advanced Training Curriculum. | |
| Assessments are detailed with online links in Domain 1 of the Paediatric Rheumatology Advanced Training Curriculum. | |

| **DOMAIN 1** | **FUNDAMENTALS OF RHEUMATOLOGY PRACTICE** |
|---|---|
| **Theme 1.2** | Diagnosis in Paediatric Rheumatology |
| **Learning Objective 1.2.1** | Elicit medical history to diagnose accurately and manage appropriately paediatric patients with suspected or established rheumatic disorders |
| **Links** | BTC 1.1.1 Elicit the history and obtain other relevant data |
| | BTC 1.1.3 Synthesise findings from history and examination to develop a differential diagnosis and management plan |

| **Knowledge** | **Skills** |
|---|---|
| • 2.1.1.1 classification of musculoskeletal conditions<br>• 2.2.1.3 pathophysiology<br>• 2.3.1 paediatric musculoskeletal and connective tissue conditions and problems<br>• 2.3.2 relevant adult musculoskeletal conditions and problems. | • 2.5.1 elicit a history from child and parents<br>• 2.5.3 use, apply, and interpret measures of disease activity, functional status, including growth and developmental status, and cumulative damage that are appropriate for the patient's condition<br>• 2.5.4 elaborate an appropriate differential diagnosis and an investigational plan<br>• 2.5.5 analyse and interpret clinical, laboratory, and imaging data<br>• 2.5.6 develop an appropriate management plan<br>• 2.5.7 recognise, assess and manage emergency rheumatological conditions<br>• 2.5.8 design an appropriate follow-up plan<br>• 2.5.9 demonstrate effective, appropriate, and timely cooperation with other health professionals. |

| **Assessment Methods** |
|---|
| • logbook<br>• mini-CEX<br>• case review<br>• supervisors report. |

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.2** | Diagnosis in Paediatric Rheumatology |
| **Learning Objective 1.2.2** | Examine the musculoskeletal and other systems to diagnose accurately and manage appropriately paediatric patients with suspected or established rheumatic disorders |
| **Links** | BTC 1.1.2 Conduct an appropriate physical examination |
| | BTC 1.1.3 Synthesise findings from history and examination to develop a differential diagnosis and management plan |

| Knowledge | Skills |
|---|---|
| • 2.1.1.1 classification of musculoskeletal conditions<br>• 2.2.1.3 pathophysiology<br>• 2.3.1 paediatric musculoskeletal conditions and problems<br>• 2.3.2 relevant adult musculoskeletal and connective tissue conditions and problems. | • 2.5.3 use, apply, and interpret measures of disease activity, functional status, including growth and developmental status, and cumulative damage that are appropriate for the patient's condition<br>• 2.5.7 recognise, assess and manage emergency rheumatological conditions. |

| Assessment Methods |
|---|
| • logbook<br>• mini-CEX. |

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.2** | Diagnosis in Paediatric Rheumatology |
| **Learning Objective 1.2.3** | Order and interpret relevant, cost-effective investigations to diagnose accurately and manage paediatric patients with suspected or established rheumatic disorders |

| Knowledge | Skills |
|---|---|
| • describe appropriate sedation and pain management techniques for young people<br>• describe laboratory investigations, blood and urine tests, relevant to rheumatological diagnosis:<br>  • blood counts, clinical chemistry, and indices of inflammation<br>  • immunological tests: autoantibodies, immunoglobulins, and electrophoresis<br>  • specialised chemistry tests<br>  • genetic markers<br>  • coagulation tests<br>  • general medical tests, e.g. thyroid function<br>  • serological tests, e.g. hepatitis B, C and HIV screening<br>  • microscopy and microbiology tests<br>  • standard microscopy, culture, and sensitivity testing of biological fluids<br>  • microscopy of urinary sediment<br>• describe relevant radiological and imaging investigations:<br>  • plain radiographs<br>  • MRI and CT scanning<br>  • specialised tests, e.g. PET scanning<br>  • isotope bone scanning<br>  • bone mineral density scanning<br>  • diagnostic ultrasound<br>• describe biopsy and histopathology relevant to the investigation of rheumatic disorders:<br>  • renal biopsy<br>  • metabolic bone biopsy<br>  • skin biopsy<br>  • muscle biopsy<br>  • peripheral nerve biopsy<br>• describe neuroelectrophysiological tests relevant to the investigation of rheumatic disorders:<br>  • nerve conduction<br>  • electromyography<br>• explain Bayesian theory as it applies to diagnostic tests in rheumatic disease<br>• describe the resource implications and availability of investigations | • form an investigation plan for each patient presenting with suspected rheumatic disease<br>• order tests in a logical sequence progressing from simple to more complex, and from screening to diagnostic testing:<br>  • e.g. order antinuclear antibody test (ANA) before double stranded DNA (dsDNA) antibodies<br>• recognise when tests are not required based on the clinical history:<br>  • e.g. ANA in a child with typical mechanical leg pains or benign nocturnal limb (growing) pains, and no history to suggest inflammatory arthritis<br>• arrange appropriate sedation and pain management techniques<br>• show sensitivity towards child and family anxiety in relation to investigations and provide explanations appropriate to patient's level of knowledge and understanding<br>• follow up on test results and take action based upon them, communicates results to patients<br>• maintain relationships with laboratory, imaging and other diagnostic services<br>• ask for and receive advice in complex cases<br>• use diagnostic services cost-effectively. |

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.2** | Diagnosis in Paediatric Rheumatology |
| **Learning Objective 1.2.3** | Order and interpret relevant, cost-effective investigations to diagnose accurately and manage paediatric patients with suspected or established rheumatic disorders |

- recognise the impact on children and family of the particular tests arranged, i.e. physical and emotional effects.

**Assessment Methods**

- direct observation - observed clinical encounters
- chart review
- case presentation for peer review
- audit.

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objective 1.3.1** | Prescribe and monitor pharmacological therapeutics in children with rheumatic disorders |

**Knowledge**

- describe the pharmacology, toxicology, and therapeutics of:
  - symptomatic treatments for rheumatic disease including -
  - analgesics
  - non-steroid anti-inflammatory drugs (NSAIDs)
  - intra-articular long-acting corticosteroid injections
  - disease modifying anti-rheumatic drugs, both conventional and biological
  - drugs used in chronic pain management
  - oral and intravenous (IV) glucocorticoids
  - cytotoxic drugs as used for severe autoimmune diseases, e.g. systemic lupus erythematosus (SLE) and vasculitis
  - IV therapies for severe Raynaud's phenomenon and pulmonary arterial hypertension.

**Skills**

- use drug toxicity monitoring
- use disease activity indexes
- use combination therapies in inflammatory disease
- use laboratory, imaging, and bone density modalities to monitor patients for long-term effects of drugs
- select drug therapy related to severity of patient's condition and likelihood of benefit
- evaluate and manage risks and benefits of treatment, and communicate these to the patient.

**Assessment Methods**

- direct observation - observed clinical encounter
- audit - chart review.

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objective 1.3.2** | Use core rheumatologic procedures in the management of paediatric patients with rheumatic disorders |

| Knowledge | Skills |
|---|---|
| • describe the indications for joint aspiration<br>• describe the indications for local and intra-articular steroid injection<br>• explain the risks and benefits of joint aspiration, local and intra-articular injection treatment<br>• describe the indications and techniques for nerve block<br>• outline how to perform polarised light microscopy for crystal arthritis<br>• describe the indications for intrathecal or epidural injection. | • arrange appropriate sedation, anaesthesia and analgesia for children requiring procedures<br>• use soft tissue injection therapy, e.g. bursitis and tendonitis<br>• perform arthrocentesis of large and small joints<br>• use intra-articular injection on small and large joints<br>• explain metabolic bone biopsy (observed)<br>• explain and arrange a skin biopsy<br>• observe synovial fluid examination by polarised light microscopy. |

| Assessment Methods |
|---|
| • direct observation of supervised procedures<br>• logbook. |

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objective 1.3.3** | Use and monitor non-pharmacological, non-surgical interventions in paediatric patients with rheumatic disorders |

| Knowledge | Skills |
|---|---|
| • describe the use of the following interventions:<br>  • physiotherapy<br>  • occupational therapy<br>  • podiatry<br>  • orthotics<br>  • dietary therapy<br>  • exercise therapy<br>  • patient education<br>  • self-management<br>  • accessing community services. | • work in a multidisciplinary team<br>• make appropriate referral to allied health professionals, such as:<br>  • nursing staff<br>  • physiotherapist<br>  • occupational therapist<br>  • clinical psychologist, including neuropsychologist and educational psychologist<br>  • nutritionist/dietician<br>  • social worker<br>  • podiatrist<br>  • orthotist. |

| Assessment Methods |
|---|
| • Multi-Source Feedback (MSF)<br>• chart review<br>• direct observation. |

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objective 1.3.4** | Collaborate with other medical services to appropriately manage paediatric patients with rheumatic disorders |

| Knowledge | Skills |
|---|---|
| • describe the roles of the following services:<br>  • general practice<br>  • general paediatricians<br>  • other paediatric rheumatology physicians<br>  • ophthalmology<br>  • dermatology<br>  • psychiatry<br>  • interventional radiology<br>  • orthopaedic surgery<br>  • plastic surgery<br>  • faciomaxillary surgery<br>  • other paediatric subspecialties. | • work collaboratively with other health service professionals to achieve desired outcomes for paediatric patients. |

| Assessment Methods |
|---|
| • MSF<br>• chart review. |

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objective 1.3.5** | Develop a treatment plan for and support the paediatric patient through the process of transition of care to the most appropriate adult rheumatology service |

| Knowledge | Skills |
|---|---|
| • discuss approaches to patient management<br>• describe the principles involved in transition of care to adult rheumatology services<br>• describe the impact and relevance of rheumatologic disease on attainment of independence in all aspects of life as an adult<br>• recognise that management plans for rheumatic disease in childhood are not always identical to those in adults<br>• discuss transition issues and requirements for development into adulthood and management as adult patients. | • formulate a management plan with the appropriate selection and sequencing of therapeutic modalities<br>• prepare a patient and his/her family for transition to adult care. |

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objective 1.3.5** | Develop a treatment plan for and support the paediatric patient through the process of transition of care to the most appropriate adult rheumatology service |

**Assessment Methods**

- MSF
- chart review
- direct observation.

| DOMAIN 1 | FUNDAMENTALS OF RHEUMATOLOGY PRACTICE |
|---|---|
| **Theme 1.3** | Therapeutics in Rheumatology |
| **Learning Objective 1.3.6** | Appreciate the differences between paediatric and adult patients and the impact of rheumatic disease in childhood |

**Knowledge**

- discuss the impact and relevance of rheumatologic disease on the social, educational, emotional and physical development of the child
- describe normal growth and development, including puberty
- describe the pharmacological differences between children and adults
- discuss other family and psychosocial issues, including recognition of the impact a child with rheumatic disease will have on the family, including siblings, in emotional, financial, social, mobility, educational, and professional terms
- describe potential school and other educational issues.

**Assessment Methods**

- MSF
- chart review
- direct observation.

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| To fulfil the learning objectives listed in Domain 1, the trainee must exhibit, at the completion of training, specific competencies which include knowledge, skills, and attitudes. These are listed in Domain 2. Explanatory notes follow. | |
| **Theme 2.1** | General Knowledge |
| **Learning Objective 2.1.1** | Demonstrate operational general knowledge as applied to musculoskeletal conditions |
| 2.1.1.1 | Epidemiological methods in the study of rheumatic disease |
| 2.1.1.2 | Basic statistics for medical sciences |
| 2.1.1.3 | Principles of evidence-based practice |
| 2.1.1.4 | Economic, psychological, and social consequences of rheumatic disease |
| 2.1.1.5 | Regulation of local health systems, including allocation of resources and social policies specific to musculoskeletal conditions. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES | |
|---|---|---|
| **Theme 2.2** | Basic Sciences | |
| **Learning Objective 2.2.1** | Demonstrate operational knowledge of basic sciences as applied to musculoskeletal conditions | |
| 2.2.1.1 | **Anatomy**<br>Including the structure and function of: | |
| | • bone<br>• joints<br>• connective tissue<br>• muscle | • tendons<br>• nerves<br>• blood vessels. |
| 2.2.1.2 | **Immunology**<br>Including the basic structure and function of: | |
| | • central and peripheral lymphoid organs | • cellular and molecular components of the immune system. |
| 2.2.1.3 | **Physiology**<br>As applicable to the understanding of the mechanisms and the treatment of musculoskeletal conditions, including: | |
| | • cellular and molecular biology<br>• biomechanics<br>• pathophysiology of pain<br>• immune mechanisms (auto-immunity, immune complexes, graft-vs.-host disease) | • genetics<br>• infectious agents<br>• growth development and puberty. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.2** | Basic Sciences |
| **Learning Objective 2.2.1** | Demonstrate operational knowledge of basic sciences as applied to musculoskeletal conditions |
| 2.2.1.4 | **Pharmacology**<br>Including basic principles of drug management, pharmacology of agents used in rheumatic disease and their interactions with other medications. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES | |
|---|---|---|
| **Theme 2.3** | Clinical Sciences | |
| **Learning Objective 2.3.1** | Demonstrate operational knowledge as applied to paediatric rheumatic disorders and related conditions | |
| 2.3.1.1 | Classification of paediatric rheumatic disorders. | |
| 2.3.1.2 | Demonstrate indepth and updated knowledge of the paediatric rheumatic disorders listed in the list of rheumatic disorders: | |
| | • epidemiology<br>• natural history<br>• aetiology | • clinical presentation<br>• pathology<br>• treatment. |
| | The depth of knowledge expected shall be proportional to the prevalence and potential seriousness of each condition in current rheumatology practice. | |
| 2.3.1.3 | Demonstrate operational knowledge of non-musculoskeletal conditions involved in differential diagnosis or having implications for the management of musculoskeletal conditions, such as: | |
| | • developmental anomalies<br>• infections of bone and joint<br>• post-infectious syndromes<br>• cardiovascular and renal disease<br>• diabetes mellitus and hypertension | • muscle dystrophies<br>• inflicted (non-accidental) injury<br>• bleeding and hypercoagulable disorders<br>• genetic/dysplastic disorders<br>• interstitial lung diseases. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.3** | Clinical Sciences |
| **Learning Objective 2.3.2** | Assess and manage paediatric rheumatic disorders and related conditions |
| 2.3.2.1 | In Australia and New Zealand paediatric rheumatology is a separate medical specialty primarily practiced by paediatric rheumatologists. Adult trained rheumatologists may under some circumstances be involved in the care of paediatric patients. It is recommended that they should do so in consultation with a paediatric rheumatologist or a general paediatrician. These recommendations are aimed at the minimum competence for adult rheumatologists.<br><br>Rheumatologists will be responsible for continued care for children with musculoskeletal conditions that persist through adolescence into adulthood and must, therefore, be well trained in dealing with adolescents and paediatric diseases persisting into adulthood and their sequelae.<br><br>Both paediatric rheumatologists and adult rheumatologists who care for children, should be able to: |
| 2.3.2.2 | Assess and formulate a limited differential diagnosis for the conditions listed under no.15 of the list of rheumatic disorders, including consideration of non-musculoskeletal conditions in children that can mimic musculoskeletal conditions, no.16 of the list of rheumatic disorders. |
| 2.3.2.3 | Recognise the principles of management of the child with a musculoskeletal condition and of specific diseases as listed under no. 15 of the list of rheumatic disorders. |
| 2.3.2.4 | Describe the natural history of common adult musculoskeletal condition and their major complications, no.17 of the list of rheumatic disorders.<br><br>Demonstrate understanding of the use of 'adult specific' investigations, e.g. polarised light microscopy of synovial fluid for crystals; routine monitoring for hypertension, renal function, type 2 diabetes mellitus (NIDDM) and hyperlipidemia in adults; recognising that the onset of these problems, particularly as pertaining to cardiovascular disease, are increasingly recognised as having their onset in childhood. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.3** | Clinical Sciences |
| **Learning Objective 2.3.3** | Demonstrate operational knowledge as applied to the investigation of musculoskeletal conditions |

| | | |
|---|---|---|
| 2.3.3.1 | Demonstrate full understanding of the biologic rationale, use, cost, limitations, and interpretation of all investigations used in the regular management of musculoskeletal conditions and syndromes.<br>This will include consideration of test-performance characteristics: sensitivity, specificity, and predictive value. The trainee will have an operational knowledge of the methods used for such tests. | |
| 2.3.3.2 | **Investigations include: diagnostic testing** | |
| **A.** | **Laboratory tests:**<br>For each test, understand the biologic rationale, methods for performing, and use/limitations of specific laboratory tests including but not limited to: | |
| 1. | Erythrocyte sedimentation rate, C-reactive protein, and other acute phase reactants | |
| 2. | Antinuclear antibodies | |
| 3. | Rheumatoid factors and anti-cyclic citrullinated peptide antibodies | |
| 4. | Extractable nuclear antigens, subtype specificities, including: | |
| | • anti-dsDNA<br>• anti-U1 RNP<br>• anti-histone antibodies and LE cell preparation | • anti-Smith<br>• anti-centromere antibodies |
| 5. | Anti-ribosomal P, anti-topoisomerase 1, and anti-synthase antibodies including anti-Jo-1 | |
| 6. | Anti-neutrophil cytoplasmic antibodies including specificities for neutrophil granule constituents (anti-PR3, anti-myeloperoxidase) | |
| 7. | Antiphospholipid antibodies, including: | |
| | • rapid plasma reagin<br>• anticardiolipin | • lupus anticoagulant<br>• beta-2-glycoprotein I antibodies |
| 8. | Antibodies to formed blood elements, including: | |
| | • direct and indirect Coombs testing<br>• anti-granulocyte antibodies | • anti-platelet antibodies |
| 9. | Assays for complement activity (CH50) and components of the complement cascade | |
| 10. | Serum immunoglobulin levels, serum protein electropheresis, and immunofixation electropheresis | |
| 11. | HLA typing | |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.3** | Clinical Sciences |
| **Learning Objective 2.3.3** | Demonstrate operational knowledge as applied to the investigation of musculoskeletal conditions |

| | | |
|---|---|---|
| 12. | Streptococcal serology, ASOT and DNase B | |
| 13. | Serologic and PCR tests for: | |
| | • mycoplasma<br>• Epstein-Barr virus<br>• hepatitis B and hepatitis C | • HIV<br>• parvovirus<br>• other infectious agents, e.g. Lyme |
| 14. | Serum and urine measurements for uric acid | |
| 15. | Iron studies including ferritin | |
| 16. | Flow cytometry studies for analysis of lymphocyte subsets and function | |
| 17. | Specific genetic testing, e.g. storage disorders and dysplasias, and autoinflammatory conditions. | |
| **B.** | **Diagnostic imaging techniques**<br>Understand the basic underlying principles and technical considerations in the use of: | |
| | • plain radiographs<br>• MRI | • CAT<br>• ultrasonography and radionuclide scanning of bones, joints, and periarticular and vascular structures. |
| **C.** | **Synovial fluid analysis** | |
| | • cell count and differentia<br>• viscosity<br>• glucose | • crystal identification<br>• protein<br>• other special stains/analyses. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES | | |
|---|---|---|---|
| **Theme 2.4** | Therapeutics | | |
| **Learning Objective 2.4.1** | Therapeutic modalities and strategies | | |
| 2.4.1.1 | **Pharmacology**<br>For each medication understand the: | | |
| | • dosing<br>• metabolism<br>• side effects<br>• compliance issues | • pharmacokinetics<br>• mechanisms of action<br>• drug interactions<br>• costs | |
| | • use in specific patient populations, such as renal insufficiency and including fertile, lactating, and pregnant adolescents | | |
| a. | NSAIDs | | |
| b. | Glucocorticoids: intra-articular, topical and systemic, both oral and IV | | |
| c. | Systemic antirheumatic drugs, including: | | |
| | • methotrexate<br>• leflunomide<br>• gold compounds | • sulphasalazine<br>• antimalarials, particularly hydroxychloroquine | |
| d. | Cytotoxic drugs, including: | | |
| | • azathioprine | • cyclophosphamide | • chlorambucil |
| e. | Immuno-modulatory drugs, including: | | |
| | • cyclosporine | • mycophenolate mofetil | • tacrolimus |
| f. | Biologic agents, including: | | |
| | • TNF alpha inhibitors<br>• anti-lymphocyte monoclonal antibodies, e.g. rituximab<br>• interleukin-6 (IL-6) inhibitors, e.g. tocilizumab | • interleukin-1 (IL-1) inhibitors, e.g. anakinra<br>• co-stimulatory inhibitors, e.g. abatacept | |
| g. | Antibiotic therapy for septic joints | | |
| h. | Narcotic and non-narcotic analgesics | | |
| i. | Tricyclics and other agents used for pain modulation | | |
| j. | Anticholinergics and non-pharmacologic agents used for the treatment of sicca symptoms | | |
| k. | Others: | | |
| | • apheresis<br>• plasma exchange | • autologous stem cell transplantation. | |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.4** | Therapeutics |
| **Learning Objective 2.4.2** | Physical therapy and rehabilitation |
| 2.4.2.1 | Demonstrate operational knowledge of indications, risks, and limitations of physical therapy and rehabilitation, including: |
| | • footwear and orthotics<br>• hydrotherapy<br>• adaptive equipment and assistive devices<br>• rest and splinting<br>• spa therapy<br>• joint protection and energy conservation techniques |
| | • exercise therapy - range of motion, strengthening, conditioning, and stretching. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.4** | Therapeutics |
| **Learning Objective 2.4.3** | Prevention of musculoskeletal conditions |
| 2.4.3.1 | Demonstrate operational knowledge of methods used in prevention of musculoskeletal conditions, including: |
| | • sport and activity related disorders<br>• postural and sedentariness<br>• life-style and nutritional issues<br>• patient education. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.4** | Therapeutics |
| **Learning Objective 2.4.4** | Appropriate use of and referral to multidisciplinary (therapy) services and pain services |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES | | |
|---|---|---|---|
| **Theme 2.4** | Therapeutics | | |
| **Learning Objective 2.4.5** | Psychosocial aspects of disability | | |
| 2.4.5.1 | Demonstrate an understanding of the psychosocial aspects of disability on children and families | | |
| | Understand the impact that the following factors have on the overall therapy of a patient with rheumatic disease | | |
| | Demonstrate knowledge of what can be done to assist families and patients in these areas: | | |
| a. | Psychological, emotional, and spiritual aspects of disease, including sexuality | | |
| b. | Specific adolescent issues: | | |
| | • emotional development and independence | • body image | • risk taking behaviours |
| c. | Disability determination: | | |
| | • impairment vs. disability<br>• carers allowance and payments<br>• educational supports | • evaluation and measurement<br>• disability pension (adolescents)<br>• career advice and planning | |
| | • curriculum council requirements including school examinations considerations | | |
| d. | Compliance issues. | | |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES | |
|---|---|---|
| **Theme 2.4** | Therapeutics | |
| **Learning Objective 2.4.6** | Surgical intervention | |
| 2.4.6.1 | For common surgical procedures employed in the treatment of musculoskeletal conditions, the trainee should demonstrate operational knowledge of: | |
| | • indications<br>• contraindications<br>• postoperative management | • preoperative evaluation and medication adjustments<br>• complications<br>• expected outcome. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.4** | Therapeutics |
| **Learning Objective 2.4.7** | Complementary or unproven medicine |
| 2.4.7.1 | The trainee should demonstrate operational knowledge of alternative practices, including:<br>• diet<br>• antimicrobials<br>• chiropractic<br>• topical therapies<br>• nutritional supplements<br>• acupuncture<br>• homeopathic remedies<br>• venoms and others<br>The trainee should be able to discuss the evidence base for these treatments and communicate these to patients. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| The core clinical skills required from the new rheumatologist include the ability to collect and interpret relevant information about a young person with a musculoskeletal problem, including:<br>• history<br>• physical examination<br>• laboratory<br>• imaging studies. |
| The trainee should be able to use it in the light of medical knowledge to:<br>• perform differential diagnosis<br>• assess the patient's global status<br>• plan further evaluation<br>• organise and implement a comprehensive management plan for the patient and assess its effect. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| **Learning Objective 2.5.1** | Elicit a history |
| 2.5.1.1 | Including history from children, parents or other medical professionals that is relevant, concise, accurate, and appropriate to the patient's problem(s), including consideration of the patient's perspective. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| **Learning Objective 2.5.2** | Perform physical examination |
| 2.5.2.1 | Including full detailed assessment of the musculoskeletal system appropriate to the patient's problems. |
| | The history and physical examination must recognise non-articular manifestations, especially those with potential implications in the diagnosis and/or management of musculoskeletal conditions. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES | |
|---|---|---|
| **Theme 2.5** | Clinical Skills | |
| **Learning Objective 2.5.3** | Use, apply, and interpret measures of disease activity, functional status, cumulative damage, and quality of life, that are appropriate for the child's condition | |
| 2.5.3.1 | • The Childhood Health Questionnaire (CHAQ)<br>• American College of Rheumatology Pediatric 30 (ACR-Pedi 30)<br>• Bath Ankylosing Spondylitis Functional Index (BASFI), BAS Disease Activity Index (BASDAI), BAS Metrolofy Index (BASMI) for Juvenile Ankylosing Spondylitis (AS) | • Child Health Questionnaire 50 (CHQ-50)<br>• SLE Disease Activity Index (SLEDAI)<br>• Short Form 36 Health Survey (SF36). |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| **Learning Objective 2.5.4** | Elaborate an appropriate differential diagnosis and an investigational plan |
| 2.5.4.1 | Which demonstrates:<br>• a rational and cost-effective use of investigations<br>• interpretation of relevant investigations. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| **Learning Objective 2.5.5** | Analyse and interpret clinical, laboratory, and imaging data |
| 2.5.5.1 | Derived by the above processes to establish the most likely diagnosis/diagnoses and a comprehensive assessment of the patient's status. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| **Learning Objective 2.5.6** | Develop an appropriate management plan |
| 2.5.6.1 | Based on up-to-date scientific information as well as clinical judgment, that accounts for cost and patient preferences and circumstances. |
| | This will include demonstration of the ability to:<br>• use medications and other therapeutic options<br>• perform patient and family education and support<br>• employ preventive care<br>• incorporate the expertise of other health professionals. |
| | The new paediatric rheumatologist will demonstrate appropriate use of medications under special circumstances, including:<br>• early childhood, and safe 'off license' use of medications<br>• potential childbearing years or pregnancy and lactation<br>• immunodeficiency states - trisomy 21, common variable immunodeficiency (CVID), hypo-gammaglobulinaemia etc<br>• renal insufficiency. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES | |
|---|---|---|
| **Theme 2.5** | Clinical Skills | |
| **Learning Objective 2.5.7** | Recognise, assess and manage emergency rheumatological situations | |
| 2.5.7.1 | • Kawasaki disease<br>• atlantoaxial dislocation<br>• systemic onset juvenile idiopathic arthritis (JIA) - tamponade<br>• aortic valve and root rupture or dissection in Takayasu arteritis<br>• haemophagocytic lymphohistiocytosis | • macrophage activation syndrome<br>• catastrophic phospholipid antibody syndrome<br>• scleroderma renal crisis and pulmonary arterial hypertension<br>• severe sepsis, including unusual and potentially fatal sites. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| **Learning Objective 2.5.8** | Design an appropriate follow-up plan |
| 2.5.8.1 | Including:<br>• the assessment of response to treatment<br>• knowledge of expectations<br>• recognition of adverse events. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.5** | Clinical Skills |
| **Learning Objective 2.5.9** | Demonstrate effective, appropriate, and timely cooperation with other health professionals |
| 2.5.9.1 | As needed for optimal patient care. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.6** | Technical Skills |
| Routinely and safely perform without supervision the following technical procedures, using age-appropriate pain management techniques: | |
| **Learning Objective 2.6.1** | Aspiration of joints and bursae |
| **Learning Objective 2.6.2** | Injection of joints and soft tissue |
| **Learning Objective 2.6.3** | Synovial fluid for infection or other disorder |
| **Learning Objective 2.6.4** | Interpretation of musculoskeletal imaging, bone scintigraphy, and bone densitometry |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.7** | Optional Skills |
| **Learning Objective 2.7.1** | Perform procedures considered optional |
| 2.7.1.1 | The performance of the following procedures are considered optional and may be the object of specific regulation at a national level:<br>• biopsies of relevant tissues and organs, e.g. synovium, skin, subcutaneous fat, minor salivary glands, bone, muscle, nerves, kidney, and temporal artery<br>• bone densitometry<br>• musculoskeletal ultrasound<br>• capillaroscopy<br>• electromyography<br>• arthroscopy<br>• injection techniques under imaging guidance<br>• radioactive or chemical synovectomy<br>• other relevant procedures. |

| DOMAIN 2 | KNOWLEDGE, SKILLS, AND ATTITUDES |
|---|---|
| **Theme 2.8** | Attitudes |
| **Learning Objective 2.8.1** | Demonstrate effective behaviours to convey the highest standards of care for patients and families, and make valuable contributions to the professional development of self and others |
| 2.8.1.1 | This includes the ability to:<br>• provide compassionate and humane care<br>• work in a multidisciplinary and multiprofessional team<br>• provide timely well-documented assessments and recommendations in written and/or verbal forms<br>• perform disability determination and measurement for the purposes of assessment for carers allowance/payment etc and disability - adolescents<br>• access, retrieve, critically evaluate, and apply information from all sources in maintaining the highest standard of patient evaluation, care, and management<br>• show insight into his/her own limitations of expertise by self-assessment<br>• identify and respond appropriately to ethical issues relevant to rheumatology practice<br>• demonstrate medical expertise in situations other than those involving direct patient care, e.g.:<br>  • medical presentations<br>  • teaching<br>  • patient and referring physician education<br>  • medico-legal opinions. |

## APPENDIX: LIST OF RHEUMATIC DISORDERS

### 1. JIA

- oligoarthritis
- extended oligoarthriti
- polyarthritis RhF positive
- polyarthritis RhF negative
- psoriatic arthritis
- systemic onset arthritis
- enthesitis related arthritis
- unclassified
- chronic and acute uveitis disorders.

### 2. Secondary/other inflammatory arthritis disorders

- reactive arthritis, including viral-reactive arthritis
- inflammatory bowel disease-associated arthritis
- syndrome associated - Downs, Turners velocardiofacial/22Q
- common adult rheumatic disorders
- rheumatoid arthritis, rheumatoid factor positive/ negative
- sarcoid arthropathy
- arthritis associated with acne and other skin disease, including:
  - chronic recurrent multifocal osteomyelitis (CRMO)
  - synovitis acne pustulosis hyperostosis osteitis (SAPHO) syndrome
- ankylosing spondylitis
- immune deficiency associated arthritis
- crystal-induced arthritis, e.g. gout
- osteoarthritis
- psoriatic arthritis
- soft tissue rheumatism and pain syndromes.

### 3. Lupus erythematosus and antiphosholipid syndrome

- SLE
- discoid lupus
- neonatal lupus syndromes
- drug-related SLE
- primary and secondary antiphospholipid antibody syndrome.

### 4. Scleroderma

- diffuse and limited systemic sclerosis
- chemical/drug-related
- sclerodermiform syndromes.
- localised scleroderma syndromes:
  - morphoea
  - linear/en coup de sabre.

### 5. Other systemic connective tissue diseases

- juvenile dermatomyositis
- overlap syndromes
- mixed connective tissue disease
- polymyositis
- relapsing polychondritis
- eosinophilia-myalgia syndrome
- relapsing panniculitis
- polymyositis
- erythema nodosum
- Sjögren's syndrome

## APPENDIX: LIST OF RHEUMATIC DISORDERS

- adult-onset Still's disease
- undifferentiated autoimmune connective tissue disease.

### 6. Vasculitis and related diseases

- Kawasaki disease
- polyarteritis nodosa
- Henoch-Schonlein purpura
- Takayasu's arteritis
- systemic necrotising vasculitis overlaps
- Behcet's disease
- Wegener's granulomatosis
- Cogan's syndrome
- Sweet's syndrome
- central nervous system vasculitis
- pseudovasculitis
- hypersensitivity and small vessel vasculitis
- periaortitis (Ormond's syndrome)
- other anti-neutrophil cytoplasmic antibodies (ANCA)-associated diseases, including microscopic polyarteritis and allergic granulomatosis of Churg-Strauss.

### 7. Infectious and reactive arthritis; infectious/septic arthritis

- septic arthritis and osteomyelitis, including gonococcal
- transient synovitis of the hip - irritable hip
- viral - HIV, hepatitis B, parvovirus
- fungal
- reactive arthritis, including streptococcal and mycoplasma
- spirochetal - syphilis, Lyme
- acute rheumatic fever
- mycobacterial
- intestinal bypass arthritis
- post dysenteric arthritis
- post-immunisation arthritis
- arthritis associated with subacute bacterial endocarditis
- post viral arthropathy, parvovirus, Epstein Barr Virus, arboviruses, e.g. Ross River.

### 8. Disorders of the locomotor system associated with primarily metabolic, endocrine or haematological diseases

#### Endocrine-associated diseases

- hypoparathyroidism
- hyperparathyroidism
- acromegaly and gigantism
- rheumatic syndromes associated with diabetes mellitus
- hyperthyroidism
- hypothyroidism
- Cushing's disease.

#### Endocrine-associated diseases

- childhood leukaemias
- other myeloproliferative syndromes
- haemoglobinopathies
- Hodgkin and non-Hodgkin lymphoma
- primary and drug-induced myelodysplastic
- rheumatic syndromes associated with haemophilia and bleeding disorders.

## APPENDIX: LIST OF RHEUMATIC DISORDERS

### 9. Other

#### Congenital degenerative/avascular

- Perthes disease
- developmental dysplasia of the hip
- slipped upper femoral capital epiphysis.

#### Others

- transient osteoporosis
- hypertrophic osteoarthropathy
- rickets and osteomalacia
- insufficiency fractures.

### 10. Hereditary connective tissue disorders

#### Heritary disorders of connective tissue

- Marfan's syndrome
- osteogenesis imperfecta
- Ehlers-Danlos syndromes
- pseudoxanthoma elasticum
- hypermobility syndrome.

#### Osteochondrodysplasias

- epiphyseal dysplasias - multiple and spondylo-epiphyseal dysplasia
- metaphyseal/diaphyseal dysplasias
- inherited metabolic bone disorders: vitamin D resistant/hypophosphatasia
- osteogenesis imperfecta/bone fragility disorders
- enchondroma/exostoses disorders
- pseudo/achondroplasia
- Stickler's and other inherited collagen disorders.

#### Inborn errors of metabolism affecting connective tissue

- homocystinuria
- cystinosis
- ochronosis.

#### Storage disorders

- Farber's lipogranulomatosis
- mucolipidoses
- Fabry's disease
- mucopolysaccharidoses.

#### Immunodeficiency disorders

- IgA deficiency, CVID and other forms of hypogammaglobulinemia, e.g. Bruton's disease and hyper- IgM syndromes, and chronic granulomatosis
- acquired and hereditary neutropenia.

**Primary:** T cell defects, e.g.

## APPENDIX: LIST OF RHEUMATIC DISORDERS

| | | |
|---|---|---|
| • severe combined immunodeficiency (SCID) | • adenosine deaminase (ADA) | • purine nucleoside phosphorylase (PNP) deficiency. |
| **Secondary:** T cell deficiencies, e.g. | | |
| • HIV | • low CD4 syndrome | • drug induced. |
| **Auto-inflammatory (periodic) syndromes,** including: | | |
| • cryopyrin associated periodic fever syndrome (CAPS)<br>• familial Mediterranean fever<br>• Muckle-Wells<br>• familial cold urticaria<br>• chronic infantile neurological cutaneous and articular syndrome (CINCA)/neonatal onset multisystem inflammatory disease (NOMID) syndromes<br>• other cryopyrin associated periodic fever syndromes<br>• tumour necrosis factor receptor-associated periodic syndromes (TRAPS)<br>• hyper IgD syndrome (mevalonate kinase deficiency)<br>• periodic fever apthous stomatitis adenopathy syndrome (PFAPA). | | |
| **Others:** | | |
| • haemochromatosis<br>• fibrodysplasia ossificans progressiva and other new bone forming disorders | • hyperlipidemic arthropathy<br>• Wilson's disease. | |
| **11. Non-articular and regional musculoskeletal disorders** | | |
| • fibromyalgia<br>• chronic regional pain syndromes type 1 and 2 (reflex sympathetic dystrophy) | • myofascial pain syndromes<br>• erythromelalgia. | |
| **Osteochondritis disorders, including:** | | |
| • Sever's disease<br>• juvenile spinal osteochondritis (Schuermann) | • Osgood Schlatters<br>• Sindig-Larssen-Johanssen. | |
| **Spinal disorders, including:** | | |
| • mechanical back pain<br>• cervical pain syndromes<br>• intervertebral disc disease and radiculopathies<br>• coccydynia | • spondylolisthesis/spondylolysis<br>• infectious and aseptic intervertebral discitis<br>• osteitis pubis<br>• spinal cord conditions, including tethering and syrinx. | |

## APPENDIX: LIST OF RHEUMATIC DISORDERS

### Regional musculoskeletal disorders

In addition to bursitis, tendonitis, or enthesitis occurring around each joint, the trainee should be familiar with other disorders occurring at each specific joint site

- cysts
- shoulder-rotator cuff tear
- adhesive capsulitis
- impingement syndrome
- wrist ganglia
- knee synovial plicae
- internal derangements
- trigger fingers and Dupuytren's contractures
- hallux rigidus
- heel pain and metatarsalgia
- temporomandibular joint syndromes
- costochondritis.

### Biomechanical/anatomic abnormalities associated with regional pain syndromes

- scoliosis and kyphosis
- leg length discrepancy
- foot deformities
- tibial torsion.

### Overuse rheumatic syndromes

- occupational
- sports
- recreational
- performing artists.

### Sports medicine

- injuries
- strains
- sprains
- nutrition
- female athlete issues
- medication issues.

### Entrapment neuropathies

- thoracic outlet syndrome
- lower extremity entrapments
- upper extremity entrapments.

### 12. Neoplasms and tumour-like lesions

**Joints:** haemochromatosis, myositis ossificans progressiva, hyperlipidemic arthropathy and Wilson's disease.

**Tendon sheaths:** fibroma, giant cell tumour and nodular tenosynovitis.

**Bone:** osteoid osteoma and fibrodysplasias.

### Malignant

**Primary:** synovial sarcoma and osteosarcoma.

**Secondary:** leukaemia, neuroblastoma and metastatic malignant tumours.

**Malignancy-associated rheumatic syndromes:** carcinomatous polyarthritis and palmo-plantar fasciitis.

## APPENDIX: LIST OF RHEUMATIC DISORDERS

### 13. Muscle diseases

#### Inflammatory

- juvenile dermatomyositis (JDMS)
- polymyositis
- inclusion body myositis
- post infectious (influenza).

#### Metabolic

- **Primary:** glycogen storage diseases, lipid metabolic disorders, myoadenylate deaminase deficiency, and mitochondrial myopathies.
- **Secondary:** nutritional, toxic, endocrine disorders, electrolyte disorders, and drug-induced
- muscular dystrophies
- myasthenia gravis.

### 14. Miscellaneous rheumatic disorders

- amyloidosis: primary, secondary, and hereditary
- Raynaud's disease
- Charcot joint
- multicentric reticulohistiocytosis
- plant thorn synovitis
- remitting seronegative symmetrical synovitis with pitting oedema.

#### Intermittent arthritis

- palindromic rheumatism
- intermittent hydrarthrosis.

#### Arthritic and rheumatic syndromes associated with

- sarcoidosis – juvenile and adult type
- scurvy
- pancreatic disease
- chronic active hepatitis
- primary biliary cirrhosis
- drugs
- vaccinations
- environmental agents.

#### Other

- rheumatic disease in the neonatal population
- rheumatic disease in the pregnant young person
- rheumatic syndromes in renal insufficiency and dialysis patients
- inflammatory eye disorders: uveitis, acute and chronic anterior, pan and intermediate, and scleritis.

## APPENDIX: LIST OF RHEUMATIC DISORDERS

### 15. Paediatric musculoskeletal conditions

- JIA
- juvenile SLE
- neonatal lupus syndrome
- juvenile dermatomyositis, and polymyositis
- scleroderma syndromes
- acute rheumatic fever
- ankylosing spondylitis and undifferentiated spondyloarthropathy
- Sjogren's syndrome
- Takayasu arteritis
- Henoch-Shönlein purpura
- Kawasaki disease
- other vasculitides
- temporal arteritis and polymyalgia rheumatica
- gout and crystal arthropathies
- Felty's syndrome.

### 16. Orthopaedic/musculoskeletal conditions of importance to paediatric rheumatologist

#### Infectious or post-infectious syndromes

- septic arthritis and osteomyelitis
- inter-vertebral discitis
- Orthopaedic conditions
- spondylolysis and spondylolisthesis
- slipped capital femoral epiphysis
- osteochondritis dissecans
- tarsal coalition
- patellar subluxation and mis-tracking disorders
- transient synovitis of the hip
- post-viral myositis
- Orthopaedic conditions
- Legg-Calve-Perthes disease and other avascular necrosis syndromes
- patello-femoral syndrome/anterior knee pain
- femoral anteversion
- pes plano-valgus.

#### Non-rheumatic pain

- benign nocturnal limb pains, 'growing pains'
- benign hypermobility syndrome.
- pain amplification syndromes, including fibromyalgia syndrome, complex regional pain syndromes type 1 and 2 - reflex sympathetic dystrophy.

#### Neoplasm

- lymphoma
- leukaemia
- primary bone tumours, especially osteosarcoma and Ewing's sarcoma
- tumours metastatic to bone, especially neuroblastoma.

#### Other

- bone and cartilage dysplasias
- inherited disorders of metabolism.

## APPENDIX: LIST OF RHEUMATIC DISORDERS

| 17. | Complications of paediatric musculoskeletal conditions |
|---|---|

### JIA

- chronic anterior uveitis - ANA positive
- growth disturbances, e.g. leg length discrepancy and micrognathia
- long-term disability
- macrophage activation syndrome - systemic JIA
- cardiac tamponade - systemic JIA
- other inflammatory eye disease.

### Juvenile dermatomyositis

- gastrointestinal vasculitis
- calcinosis.

### Henoch-Schonlein purpura

- gastrointestinal: intussusception, and intestinal infarction
- pulmonary haemorrhage
- renal: chronic nephritis/renal failure.

### Neonatal lupus syndrome

- congenital heart block
- hydrocephalus
- thrombocytopenia and hepatitis.

### Systemic lupus erythematosus, vasculitides

- cardiovascular disease
- aneurysms of coronary and other arteries (Kawasaki disease)
- bone health.