STUDENT WORKBOOK
IN RHEUMATOLOGY AND REHABILITATION

Department of Medicine
Faculty of Medicine
Sabaragamuwa University of Sri Lanka

First Edition 2021

2021 Department of Medicine
Faculty of Medicine
Sabaragamuwa University of Sri Lanka

ISBN 978-624-97640-7-1

CLINICAL APPOINTMENT IN RHEUMATOLOGY AND REHABILITATION

1. Name of the student

……

2. Year passed GCE Advanced level Examination

……..

3. Duration of the appointment

From: ……/……/…… To: ……../……/……..

4. Name of the consultant

……

CONTENTS

PREFACE

Students of the Faculty of Medicine, Sabaragamuwa University of Sri Lanka, study Rheumatology ad Rehabilitation as a separate appointment of one week at Teaching Hospital Ratnapura. During this period, they will be attached to the Rheumatology unit under the Consultant Rheumatologist appointed by the Ministry of Health

The Workbook in Rheumatology and Rehabilitation is compiled to guide and assist students acquire essential knowledge and skills in these disciplines to be able to work in medical wards as intern house officers.

This Workbook is a joint effort between academic staff of the Department of Medicine, SUSL and the current Consultant Rheumatologist of the Teaching Hospital Ratnapura. Students are expected to organize their classes and do self-studies in order to complete the tasks set out in the Workbook.

We value your feedback to improve the Workbook.

Dr Champika Gamakaranage
Dr Udayangani Ramadasa
Professor Saroj Jayasinghe

AUTHORS

Dr. Champika Gamakaranage (CG). MBBS, MD (Col), MRCP (Lond), FRCP (Lond)
Consultant Physician
Senior Lecturer (Grade I), Department of Medicine, Sabaragamuwa University of Sri Lanka

Dr. G. Udayangani Ramadasa (UR). MBBS, MD, FCCP, Dip Pall Med (Clinical) RACP
Consultant Physician
Head and Senior Lecturer (Grade I), Department of Medicine, Sabaragamuwa University of Sri Lanka

Dr. Sandini Wijeweera MBBS, MD, MRCP(London)
Consultant Rheumatologist, Teaching Hospital Ratnapura

Dr. Praveen Weerathunga (PW). MBBS, MD, MRCP (UK)
Lecturer, Department of Clinical Medicine, University of Colombo

Emeritus Prof. Saroj Jayasinghe (SJ). MBBS, MD, MD (Bristol), FRCP (Lond), FCCP, PhD (Col)
Consultant Physician
Consultant to the Department of Medicine, Sabaragamuwa University of Sri Lanka
Former Chair Professor, Department of Clinical Medicine, University of Colombo

OTHER CONTRIBUTORS

Dr. K. S.N. Prasangani (KP) – Contributed with language editing
BA (Hons) in Languages (SUSL), MA in Linguistics (Kelaniya), PhD in Applied Linguistics (UNIMAS, Malaysia)
Dr. U.U.K. Udumulla (UUK) – Contributed with designing mind maps and document editing (MBBS), Demonstrator at Department of Medicine, Sabaragamuwa University of Sri Lanka.

CHAPTER 1

INTRODUCTION

Dear Students,

We have prepared a series of workbooks to guide you during your medical appointments. These include 3rd year workbook, 4th year workbook and workbook for each short appointment and a workbook for the professorial appointment.

The appointments in finer specialties are organized based on the University Grants Commission guidelines and according to the needs of the Ministry of Health.

The short appointment in Rheumatology and Rehabilitation will give you the opportunity to study Rheumatology with exposure to specific case scenarios in more detail. This workbook is prepared to provide guidance to the students during the Rheumatology and Rehabilitation appointment to cover the essential areas expected from an undergraduate. You are expected to learn the management plans in further detail. This includes the investigation, treatment of common medical conditions, management of common emergencies, which are essential clinical topics for an intern medical officer. This knowledge, skills and experience you gather during the short appointments will help you to understand patient problems in greater depth.

Your continuous assessments will be based on these workbooks.

Learning Outcomes in Rheumatology and Rehabilitation

At the end of the appointment students should be able to

1. Describe the anatomy and physiology of the joints and musculoskeletal system, pathogenesis of its disorders and scientific basis of their management
2. Obtain histories, elicit physical signs and interpret physical signs, describe pathophysiology, principles of management and prognosis of patients having the following conditions:
    - Rheumatoid arthritis
    - Osteoarthritis
    - SLE
    - Polymyositis
    - Scleroderma
    - Spondylarthritis
    - Soft-tissue rheumatism

3. Examine the following components of the locomotor system
    - Cervical spine
    - Lumbar spine
    - Hands
    - Knee joint

4. Perform a detailed clinical evaluation of a patient presenting with
    - Regional pain syndrome with emphasis to pain in the neck
    - Lower backache
    - Pain in the shoulder region
    - Pain in the knee

5. Arrive at a clinical diagnosis of disorders of the musculoskeletal system

6. Describe the indications, limitations and be able to interpret findings of investigations that are relevant:
    a. Immunological investigations in rheumatological conditions
    b. Radiological investigation of the hands, spine, knees, feet and pelvis and hip joints

7. Plan the investigations and the short- and long-term management of patients, including the pharmacological and non- pharmacological therapies in common rheumatological disorders

8. Communicate the prognosis of rheumatological disorders, obtain consent for investigations and treatment, and explain the indications and side effects of the following groups of drugs:
    - Simple analgesics
    - Non-steroidal anti-inflammatory drugs (NSAID)
    - Disease- modifying antirheumatic drugs (DMARDs)
    - Corticosteroids
    - Immunosuppressants
    - Biologics – brief idea would suffice

9. Asses the needs and describe the value of physiotherapy, occupational therapy, speech therapy in rehabilitation in patients with rheumatological, neurological and orthopedic patients

10. Write case notes, daily status, referrals, discharge summaries, clinic notes and prescriptions.

11. Demonstrate empathy and maintain high ethical standards

12. Be an effective member of the multi-disciplinary healthcare team and know the facilities and social support available for patients with long term disability in Sri Lanka

CHAPTER 2

CORE CLINICAL KNOWLEDGE AND SKILLS

At the end of the Rheumatology and Rehabilitation Appointment, you should be competent in the techniques of history taking, physical examination (general examination and examination of locomotor system) and clinical reasoning at a level of a student about to enter the Final Year.

In addition to the cases you are allocated during the apppointment, you are adviced to see the following presentations given in the next section on "Topics to cover during Reumatology Appointment"

2.1 Clinical Presentations: Rheumatology appointment

These are some of the key presentations that ought to be 'covered' during the Rheumatology Appointment.

1. Polyarthritis
2. Oligo or monoarthritis
3. General pain syndrome
4. Back ache
5. Neck pain and pain radiation to limbs
6. Soft tissue rheumatism

2.2 EMERGENCIES

Following is a list of common rheumatological emergencies:

- Systemic Lupus Erythematosus- Acute renal failure, cerebral lupus, haematological (severe autoimmune haemolytic anaemia, thrombocytopenia, anaemia, pancytopenia)
- Rheumatoid Arthritis- Atlanto- axial subluxation
- Scleroderma- Renal crisis
- Polymyositis- Ventilatory failure due to respiratory muscle weakness
- Systemic Vasculitis- rapidly progressing renal failure (Wegener's Granulomatosis, Microscopic Polyangiitis), Massive GI hemorrhage and perforation, Acute pancreatitis, Polyarteritis Nodosa
- Giant Cell Arteritis- Acute visual impairment
- Anti-Phospholipid Syndrome- Catastrophic APLS

2.3 Topics in Rheumatology

These topics are often termed as the theoretical aspects of Rheumatology and require didactic teaching (e.g., lectures) or self-study using standard textbooks.

1. Evaluation of patient with arthritis
2. Rheumatoid arthritis
3. Osteoarthritis
4. Systemic Lupus Erythematosus, APLS and other autoimmune connective tissue disorders
5. Vasculitis
6. Spondyloarthritis and crystal arthritis
7. Myositis (Inflammatory) (explanation->non-inflammatory myopathies- under neurology)
8. Metabolic bone diseases
9. Heritable connective tissue disorders (Marfan's/EDS/ Hypermobility etc.)

CHAPTER 3

HISTORY TAKING OF A PATIENT WITH A MUSCULOSKELETAL DISORDER

PRESENTING COMPLAINT

Patients with a musculoskeletal disorder would present with pain, swelling, stiffness or deformity of a joint, pain or wasting of muscles, skin rash or with nail changes.

HISTORY OF PRESENTING COMPLAINT

Most of these patients will come with joint pain. Ask about the onset, duration, which joints are involved, whether it is large joint and/or small joints, additive or fleeting type, symmetrical or asymmetrical, region (axial/peripheral/lower limb predominant) and number of joints affected (mono/ oligo/poly). Find out if there is swelling, redness or deformities and whether the pain and stiffness is more in the morning and how long it lasts. Ensure that you ask if there were similar episodes in the past. Ask about associated symptoms such as fever (suggests an infection or inflammatory disease), malaise, poor appetite, any skin rashes (e.g., malar rash of SLE), plaques (e.g., seen in psoriasis) or nail changes (also a feature of psoriasis).

Ask about dry mouth, dry eyes (suggests Sjogren Disease) and redness of eyes (seen in uveitis which accompanies spondyloarthritis). Mouth ulcers and ulcers in the other mucosal orifices are features of SLE and Behcet's. Ask if there was associated dysuria or any preceding diarrheal illness seen with certain reactive arthritis (a type of spondyloarthritis). Find out whether there is pain and change of skin color when hands are exposed to cold water i.e., Raynaud's phenomenon and whether any changes were noted in the skin elasticity and difficulty in opening mouth, i.e., features of scleroderma.

Find out what is the impact on activities of daily living (ADL) such as writing, buttoning up, brushing hair, walking, combing hair, cooking eating and other activities.

SYSTEMIC INQUIRY

This is performed to identify symptoms which could have been missed in the presenting complaint or the symptoms which are not related to presenting complaint. It helps to identify complications and systemic manifestations of these disorders.

- **Systemic**: fevers (e.g., discitis, septic arthritis, SLE), weight change (e.g., malignancy)
- **Cardiovascular**: chest pain, shortness of breath on exertion
- **Respiratory**: shortness of breath, wheezing, cough, pleuritic chest pain
- **Gastrointestinal**: nausea, dyspepsia, dysphagia, abdominal pain, loose stools or constipation
- **Genitourinary**: dysuria, hematuria
- **Neurological**: seizures, altered level of consciousness, behavioral change restlessness
- **Musculoskeletal**: joint pain, reduced range of joint movement, muscle pain
- **Dermatological**: rashes in the face and other places, nail changes

PAST MEDICAL HISTORY

Ask about the medical problems, in the past or currently ongoing diseases such as epilepsy, diabetes mellitus, stroke, hypertension, hyperlipidemia, ischemic heart disease. When was the diagnosis made and the medications, control and complications and if any surgery in the past?

ALLERGIES

Find out about any history of drug or food allergy and if present what exactly happened, whether it was a mild rash, associated bronchospasm, angio-edema or anaphylaxis.

DRUG HISTORY

Ask about any medicines that patient is on, whether western or herbal medicine. Any illicit drug abuses or use of intravenous drugs.

ALCOHOL AND SMOKING

Note whether the patient is a smoker or ex-smoker. If yes calculate the pack years. Record the type, frequency, amount of alcohol consumption per week. Find out about physical, social, psychological adverse effects due to alcohol and whether patient is dependent on alcohol.

FAMILY HISTORY

Ask about family history of rheumatological disorders, dermatological diseases or malignancies.

SOCIAL HISTORY

Find out about financial support, level of education, current employment and how this illness impacted on activities at home, work place and in society, shopping and marketing. What kind of personal support and care giver support at home is available? Find out the home environment for safety and accessibility and what kind of changes could be recommended.

SYMPTOM ANALYSIS

Clinical presentation	List 3 causes	Describe how would you differentiate each cause you mentioned
Mono arthritis/ oligo arthritis	1.	
	2.	
	3.	
Poly arthritis	1.	
	2.	
	3.	
Vasculitis	1.	
	2.	
	3.	
Muscle wasting	1.	
	2.	
	3.	
Back pain	1.	
	2.	
	3.	

Write key clinical features of systemic sclerosis explaining the pathophysiology

C	
R	
E	
S	
T	

Complete the following table of clinical features in SLE

System	**Complication**	**Presenting symptoms**
General	Constitutional	Fever, malaise, loss of weight
Musculoskeletal		
Respiratory		
Gastrointestinal		
Renal		
Cardiovascular		
Neurological		
Dermatological		
Haematological		

CHAPTER 4

EXAMINATION OF THE MUSCULOSKELETAL SYSTEM (INTRODUCTION)

The copy write permission of this section was obtained from Prof Saroj Jayasinghe, the co-author of the Undergraduate Clinical Skills in Medicine 1st edition in 2020

The examination of MSK is approached in a manner different to other systems. There is a set of screening procedures known as 'GALS' (for Gait, Arms, Legs and Spine) which helps to identify areas affected, followed by REMS (Regional Examination of the MSK system) where these affected areas are examined in further detail. The steps in GALS are listed below:

GAIT

- Observe the gait as the patient walks in and while standing in the anatomical position.
- Request the patient to sit comfortably.

ARMS

Once the patient sits down do the following.

- Observe backs of hands and wrists
- Observe palms
- Assess power of grip (by requesting to squeeze two of your fingers)
- Assess small muscles by requesting to mimic taking a 'pinch' of salt
- Squeeze meta-carpo-phalangeal joints (if there is arthritis the patient will complain of pain)
- Get patient to move hands behind head (movement)

LEGS

- Patient must lie down flat in bed for the next set of examinations
- Assess full flexion of the leg
- Assess for internal rotation of hips
- Check for patellar tap (which if present you feel a tap due to fluid in the knees)
- Inspect feet for deformities and swelling
- Squeeze the meta-tarso-phalangeal joints (if there is arthritis the patient will complain of pain)

SPINE

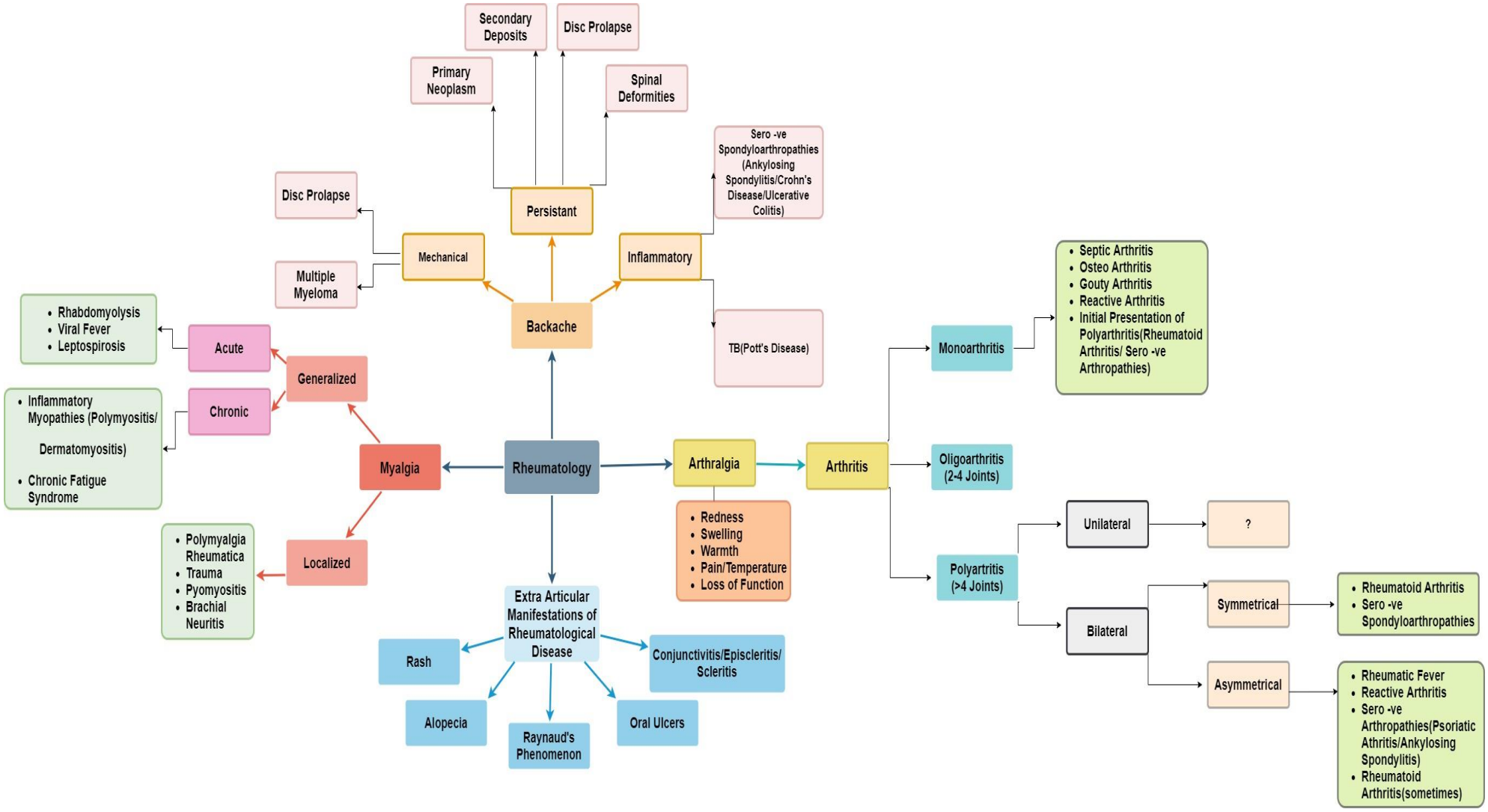
- Request patient to stand
- Inspect spine from behind and note deformities, especially scoliosis. Early scoliosis can be noted by slight asymmetries of spine and asymmetries in skin folds on either side
- Assess lateral flexion of neck
- Do the lumbar spine movements. Be careful if the patient already has back ache because a condition such as lumbar disc prolapse could get worse.

REMS (Regional Examination of the Musculo-Skeletal system**)**
This follows the basic sequence of four steps.

- Inspection (i.e., to look the joints for swelling, deformities, changes in colour or rashes)
- Palpation (i.e., touch the joints for warmth and to feel for the swellings to note if its due to fluid or bony or the rubberier feeling of synovial thickening)
- Move the joints first ask the patient to move (i.e., active movement) and then the examiner gently moves the joints to its potential full range. Stop when there is pain or resistance.
- Assess function of the joints, for example can the patient move the upper limb to mix rice and bring the rice towards his or her mouth in order to eat?

Presenting a Typical Short Case of a patient with rheumatoid arthritis of hands

"On examination of Mrs X, there is symmetrical swelling of the meta-carpo-phalangeal joints and proximal interphalangeal joints of both hands. There is ulnar deviation of wrists. The small muscles of the hands are wasted, especially the thenar eminence on the left hand. The skin appears normal.
Movements of the meta-carpo-phalangeal joints are normal though painful.
The patient has a good pincer grip but poor cylindrical grip.
The elbow and wrist joint range of movement is restricted. There are no psoriatic skin or nail changes or sensory abnormalities.


Rheumatology
Backache
Persistant
Secondary Deposits
Disc Prolapse
Primary Neoplasm
Spinal Deformities
Mechanical
Disc Prolapse
Multiple Myeloma
Inflammatory
Sero -ve Spondyloarthropathies (Ankylosing Spondylitis/Crohn's Disease/Ulcerative Colitis)
TB(Pott's Disease)
Myalgia
Generalized
Acute
Rhabdomyolysis
Viral Fever
Leptospirosis
Chronic
Inflammatory Myopathies (Polymyositis/ Dermatomyositis)
Chronic Fatigue Syndrome
Localized
Polymyalgia Rheumatica
Trauma
Pyomyositis
Brachial Neuritis
Arthralgia
Redness
Swelling
Warmth
Pain/Temperature
Loss of Function
Arthritis
Monoarthritis
Septic Arthritis
Osteo Arthritis
Gouty Arthritis
Reactive Arthritis
Initial Presentation of Polyarthritis(Rheumatoid Arthritis/ Sero -ve Arthropathies)
Oligoarthritis (2-4 Joints)
Polyartritis (>4 Joints)
Unilateral
?
Bilateral
Symmetrical
Rheumatoid Arthritis
Sero -ve Spondyloarthropathies
Asymmetrical
Rheumatic Fever
Reactive Arthritis
Sero -ve Arthropathies(Psoriatic Athritis/Ankylosing Spondylitis)
Rheumatoid Arthritis(sometimes)
Extra Articular Manifestations of Rheumatological Disease
Rash
Conjunctivitis/Episcleritis/ Scleritis
Alopecia
Raynaud's Phenomenon
Oral Ulcers

CHAPTER 5

COMMON INVESTIGATIONS

1) Fill the following section based on inflammatory markers
2)
   a) Consider typical, uncomplicated and active disease of each condition. You may find different results in certain cases as they can vary in different subjects and situations.

Condition	ESR	CRP	WCC
OA	Normal	Normal	Normal
RA (uncomplicated)	High	Normal/high	Normal/ slightly high
SLE	High	Normal	Normal/ slightly low
Ankylosing spondylitis	High/normal	High/normal	normal
TB	High	Normal/ slightly high	Normal/ slightly high
Bacterial infection	High/ normal	High	High
Viral infection	Normal	Normal/ slightly high	Slightly high/ normal /low

Find compatible investigation results of each condition and write the values you found.

b) Explain how the ESR becomes elevated in inflammation?
c) Explain how CRP is produced in response to inflammation with a diagram

3) Serum autoantibody studies
   a) Explain what is meant by rheumatoid factor

   b) Give three situations where RF is elevated

   c) List five rheumatological conditions when elevated levels of serum Anti-Nuclear Antibodies (ANA) are found.

   d) Outline the significance of following autoantibodies
      (1) Anti-double stranded DNA

      (2) Anti-neutrophil cytoplasmic antibodies

      (3) Ani phospholipid antibodies

      (4) Anti- Ro and anti-La

4) Synovial fluid analysis

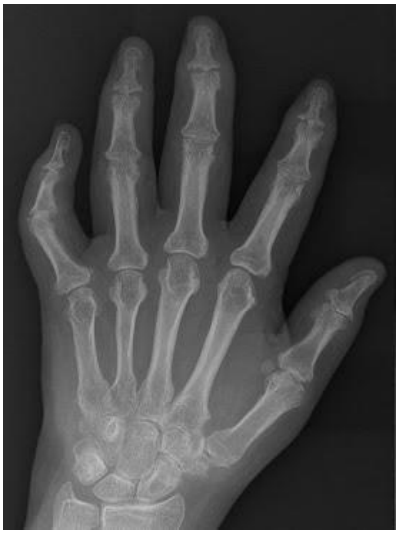
i) What are the indications for synovial fluid analysis?

ii) Describe the procedure

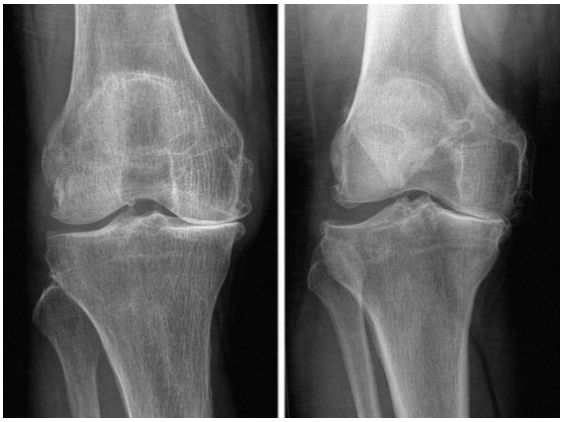
iii) Complete the table given below on synovial fluid analysis

Condition	Color	White blood cells	Polarized light microscopy for crystals	Gram stain
Normal synovial fluid				
Septic arthritis				
Gout				
Calcium pyrophosphate deposition arthropathy				

5) Radiology
   a) This is an x ray of a 52-year-old male patient who presented with small joint pain and swelling in both hands. He had been followed-up in the dermatology clinic for a chronic skin disease
      i) Describe this x ray
      ii) What is your diagnosis



6) This is an x ray of a patient who has chronic pain in both knees for 5 years. She is 65 years of age and obese



   a) Describe this x ray
   b) What is your diagnosis

CHAPTER 6

EXERCISES

1. Mono arthritis
    a. Write the history of a patient with knee pain in the patient's language and in English language
    b. Mention likely differential diagnosis for your patient
    c. How do you differentiate each cause from the history and examination?
    d. List the investigations you suggest, giving expected finding in each cause you mentioned
    e. Observe how a knee joint effusion is aspirated and methylprednisolone injection is administered for a patient with knee joint monoarthritis

2. Obtain a history from a patient with osteoarthritis and complete the section below
    a. Write a summary of the patient's history you obtained
    b. What are the physical problems encountered by a patient with osteoarthritis?
    c. Mention options for pharmacological management giving their pathophysiological basis
    d. Mention non-pharmacological management of a patient with osteoarthritis of the knee joints

3. Multiple joint pain
    a. Write the history of a patient who presents with multiple joint pain that you encountered
    b. How do you differentiate arthralgia from arthritis?
    c. Mention likely differential diagnosis for your patient
    d. How do you further investigate to come to a diagnosis on your patient?
    e. Outline the management of your patient with the rationale for their use.

4. Rheumatoid arthritis (RA)
    a. Obtain a history from a patient diagnosed to have classic RA and write a summary
    b. What are the diagnostic criteria of RA?
    c. What are the likely systemic complications of RA you checked in your patient?
    d. State four commonly used disease modifying antirheumatic drugs (DMARDs) in RA
    e. What are the side effects and limitations of each drug you mentioned?
    f. Define "biological therapies" for RA and list the drugs available in Sri Lanka.

5. Gout
    a. Explain the-pathogenesis of gout
    b. What joints are commonly affected with gout?
    c. What is the place of serum uric acid in the diagnosis of gout?
    d. How would you manage a patient who presents with acute gout?
    e. What dietary advice would you give?

6. Obtain a history from a patient diagnosed with Systemic Lupus Erythematosus (SLE) and complete the section below based on your patient
    a. What are the clinical features and investigations used to establish the diagnosis of SLE in your patient?
    b. What are the specific features you looked for in your patient when you assessed to see if there is a flair up of SLE?
    c. What are the organs or systems you examined to check whether there are complications of SLE in your patient?
    d. Write the indications for immunosuppressive treatment in SLE
    e. Mention three immunosuppressive drugs used in rheumatological disorders and state their common side effects

7. Obtain a history from a patient diagnosed with Anti-phospholipid syndrome (APLS), and complete the following section
    a. What is APLS?
    b. Explain how the diagnosis was established in your patient
    c. What are the complications of APLS?
    d. What are the different tests you detect anti-phospholipid antibodies?
    e. Briefly describe how the treatment is carried out to prevent thromboembolic complications of the condition?

8. Meet a patient diagnosed with scleroderma
    a. What are the clinical features supporting the diagnosis of scleroderma in your patient?
    b. What is Raynaud's phenomenon?
    c. What are the conditions associated with Raynaud's phenomenon?
    d. What are the systems affected with scleroderma and mention the possible complications of those systems you mention?

9. Diseases of the spine
    a. Section 1
        i. Obtain a history from a patient presented with lower back pain and write a summary of the history below
        ii. Draw a picture explaining the parts of the spine
        iii. Describe how you examine each part of spine for their range of motion
        iv. Outline the management of your patient

b. Section 2
    i. List spinal and extraspinal manifestations of ankylosing spondylitis
    ii. Describe the classic neurological manifestations associated with cervical spondylosis
    iii. Describe the neurological manifestations of L5 radiculopathy due to disc prolapse of L5/S1 disc

10. Write short notes of
    a. Frozen shoulder
    b. Plantar fasciitis
    c. Tennis elbow

CHAPTER 7

CASE SCINARIOS

In this section we expect you to write 3 histories of patients that you encountered during your Rheumatology appointment.

This book is peer reviewed and recommended as a teaching and learning material for the Department of Medicine, Faculty of Medicine Sabaragamuwa University of Sri Lanka, by the following experts,

1. **Dr. Niroshan Lokunarangoda**

MBBS (Col). MD Medicine (Col), MRCP(UK), PGCME(Col),
MRCP (Acute Medicine), MSc (Med Toxicology). MRCP (London), FRCP(Edin)
Head and Senior Lecturer and consultant Cardiologist
Department of Medicine
Rajarata University of Sri Lanka

2. **Dr. Dumitha Govindapala**

MBBS. MD (Col). MRCP (UK). FRCP (Lon). FACP (USA)
Head and Senior Lecturer and consultant Physician
Department of Medicine
Faculty of Medicine
General Sir John Kotelawala Defence University, Sri Lanka


9 786249 764071