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Immune and Rheumatic Diseases
Clinical rotation workbook

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IMMUNE AND RHEUMATIC DISEASES
CLINICAL ROTATION WORKBOOK

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Dear students!

As part of the Rheumatic and Immune Diseases course, you will complete a clinical rotation in the Department of Rheumatology. For those of you who have not completed the propaedeutics course on the rheumatology ward, this tutorial will introduce you to patients with inflammatory rheumatic diseases. You will have the opportunity to consolidate your skills in taking a focused rheumatological history and performing a physical examination.
In order to make the most of the clinical rotation in our department, it is essential that you acquire specific skills in advance. Only then will you be able to gather all the necessary information for the planning of diagnostic procedures and the final diagnosis, which is crucial for choosing the appropriate treatment for patients.
The following pages therefore serve as a guide to preparing for this clinical rotation.

We wish you a fruitful rotation and a successful learning process!

Katja Perdan Pirkmajer
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Introduction to a targeted rheumatological examination

HISTORY

The general principles for taking a history from a patient with rheumatic complaints are similar to those for other patients. You should also be aware that inflammatory rheumatic diseases can affect any organ system.

Rheumatic diseases can be characterised by marked tenderness and swelling of the joints, accompanied by prolonged morning stiffness. Alternatively, they may also present with subtle, transient and uncharacteristic joint pain (arthralgia) or tenderness and/or muscle pain (myalgia). Patients may also report systemic symptoms and signs of the disease, such as fever, general malaise, excessive fatigue and weight loss.

When treating a patient with joint pain, it is important to define the nature of tenderness (pain) as precisely as possible. Ask the patient when the pain started, how quickly it developed, which joints are affected, what aggravates or relieves the pain, and how it feels at night. Also ask about the presence or persistence of morning stiffness and joint swelling, and inquire about possible dactylitis. For patients with low back pain, it is important to determine if the pain is inflammatory (the definition of inflammatory low back pain can be found in a textbook of internal medicine).

After the patient has described their problems, ask some additional targeted questions. You should be familiar with these questions. You should also consider why you are asking each question (the answers can be found in the lecture notes or in a textbook of internal medicine.

Do you have a recurring skin rash?
Do you get a red, itchy rash in the sun?
Do your fingers turn pale or white in the cold?
Have you noticed excessive hair loss?
Do you suffer from recurring eye inflammation?
Have you noticed sores (aphthae) on the mucous membranes of your mouth, nose or genitals?
Do you have a persistently dry mouth and dry eyes?
Have you had a miscarriage or given birth to a stillborn child?
Do you remember being bitten by a tick or stung by an insect?
Have you had a recurring fever for which there is no clear cause?

Next, a thorough overview of the systems is required. We look closely for signs or symptoms that indicate involvement of the internal organs. If there are signs of internal organ involvement, you should ask further questions to determine the cause of the problem.

Examples:

- If a patient with arthritis has diarrhoea, reactive arthritis or enteropathic arthritis is suspected.
- If a patient with arthritis has burning sensations, oozing or purulent genital discharge, this may indicate reactive arthritis (following an infection with sexually transmitted microorganisms) or gonococcal arthritis.
- If a patient has difficulty swallowing, systemic sclerosis or inflammatory myopathy may be considered.

Family history

A detailed family history is also important for patients with rheumatic diseases. We are particularly interested in whether there is a history of psoriasis, chronic inflammatory bowel disease (which can cause arthritis), inflammatory rheumatic diseases such as ankylosing spondylitis and systemic connective tissue diseases, as well as metabolic diseases such as gout.

Social history

When taking a social history, we pay particular attention to the occupation of patients with joint problems. Joint and spinal pain is more common in workers and people who carry out monotonous activities with repetitive movements.

Impact of the disease on daily activities

We also need to determine how the disease affects the patient's daily activities. For example, is he or she able to perform personal hygiene independently? Can he or she cook? Can he or she feed and dress themselves? Are family members willing to help him or her? Can he or she walk up the stairs? Can he or she go shopping? Could the patient lose their job and therefore their source of income?

Assessment of patient's mental state

Chronic rheumatic diseases are often accompanied by anxiety, depression, insecurity and fear of an unfavourable course of the disease. Patients are increasingly concerned about the side effects of medication, but are often not sufficiently informed about the natural, untreated course of the disease. Doctors need to recognise the mental state of these patients and motivate them to actively participate in the treatment process. For patients with a chronic, debilitating disease, solving emotional and social problems is just as important as drug treatment.

PHYSICAL EXAMINATION

As with any medical patient, a patient with suspected inflammatory rheumatic disease requires a comprehensive physical examination with some additional tests.

JOINT EXAMINATION

A thorough joint examination is performed to verify our initial diagnosis based on the patient's medical history. We try to determine if the symptoms are due to problems affecting the bones, muscles, joints, or adjacent or distant structures.

Repeat the joint examination that you learnt in the propaedeutics course.
Learn how to perform the Schober test (Figure 1) and the measurement of thoracic expansion (respiratory index) (Figure 2) when examining the spine. Learn what these tests are, and when they should be used when examining a patient.

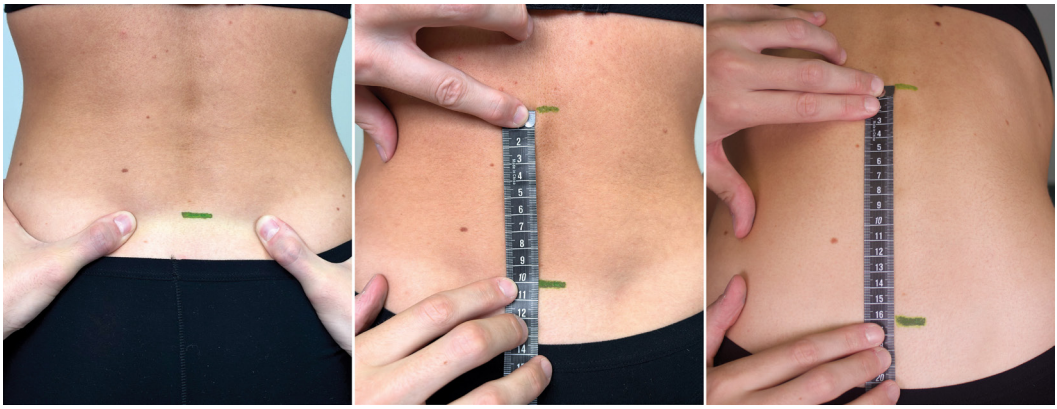

Figure 1. Schober's test

Figure 2. Respiratory index

LABORATORY TESTS

Laboratory tests are an important and usually essential part of a patient's overall treatment. They are ordered based on the information obtained from the patient's medical history and physical examination. The range of tests used will vary depending on the situation, but it is important to understand why a particular test has been ordered and what result is expected.

In rheumatology, laboratory tests are divided into basic and specialised tests.

Basic tests, such as measurement of inflammatory parameters (e.g. erythrocyte sedimentation rate and C-reactive protein concentration), complete blood count, biochemical tests (including measurement of serum urate and muscle enzyme levels), protein electrophoresis and urinalysis, play an important role in the overall assessment of most rheumatic patients. Whereas none of these tests confirms a specific rheumatic disease, they help to detect and monitor the progression of the disease and identify possible adverse effects of drugs used to treat rheumatic diseases.

Specialised tests, particularly for the detection of autoantibodies, are required for patients with or suspected of having inflammatory rheumatic diseases. Although autoantibodies are not used for population screening, their detection is important for diagnosis, monitoring disease progression and assessing response to treatment. Some autoantibodies are part of various diagnostic or classification criteria, while others have prognostic value and some even reflect disease activity.

You should learn the following before rotation:

1. What is erythrocyte sedimentation rate, and what factors can affect the results of this test?
2. What is C-reactive protein, and what information does it provide?
3. In which inflammatory rheumatic diseases can leucopenia be observed in connection with an active disease?
4. What is the most common abnormality that can be detected on protein electrophoresis in a patient with an inflammatory rheumatic disease?
5. What information do RF (rheumatoid factor) and ACPA (anticitrullinated peptide antibodies) provide?
6. In which diseases does the diagnosis also depend on the presence of antiphospholipid antibodies?
7. What are the Hep-2, ENA and ANCA tests? When do we order them?

Q: Can you see the results of one of the above tests in Figure 3?

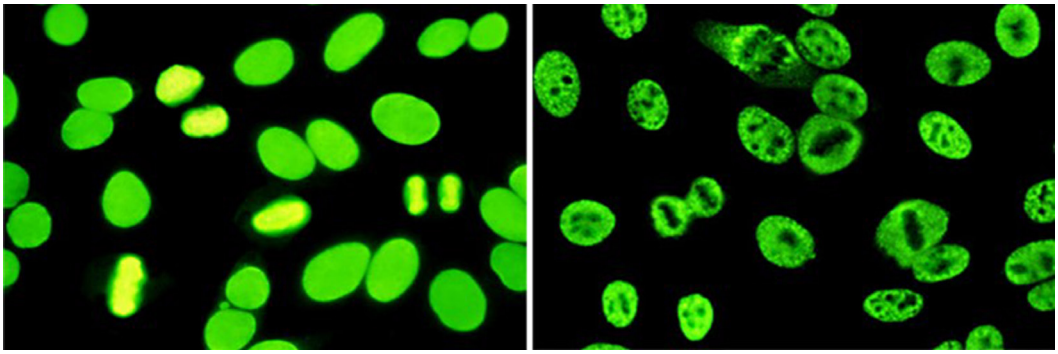

Figure 3. HEP-2 test

Q: Which row in Table 1 represents inflammatory synovial fluid?

Table 1. Synovial fluid characteristics

Colour	Clarity	Viscosity	WBC count	Neutrophil count	Gram stain	Crystals
Colourless	Translucent	Increased	‹200 cells/mm³	‹25 %	Negative	Negative
Straw like/ yellow	Translucent	Increased	200-2000 cells/mm³	‹25 %	Negative	Negative
Yellow	Cloudy	Decreased	1000-50,000 cells/mm³	›50 %	Negative	Positive
Yellow/green	Cloudy/ opaque	Decreased	›50,000 cells/mm³	›75 %	Positive	Negative
Red/xantho-chromic	Bloody	Variable	200-2000 cells/mm³	50–75 %	Negative	Negative

DIAGNOSTIC IMAGING

Radiological diagnostics play an important role in the detection and monitoring of pathological changes in bones, joints and the surrounding soft tissue. Various radiological methods, such as conventional X-ray, joint ultrasound, computed tomography and magnetic resonance imaging, can be used to assess pathological changes and monitor their activity and response to treatment.

The primary diagnostic test to assess the bone elements is the conventional X-ray.

1. In diseases such as rheumatoid arthritis, psoriatic arthritis and axial spondyloarthritis, plain X-ray images can assess the structural damage caused by the disease, support the diagnosis and help to assess the patient's prognosis. Consider how this is achieved.

2. Which imaging technique is shown in the Figure 4, and when is this X-ray projection used?

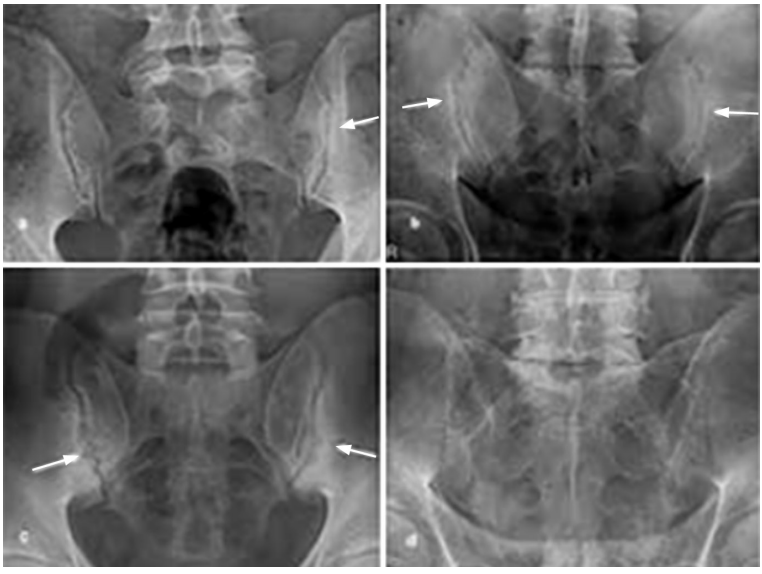

Figure 4. Staging of sacroiliitis
Source: https://www.revma.net/epna-revmatologija-12484/

FINALLY...

When we need to assess the musculoskeletal system quickly (e.g. in a family doctors or physiotherapist's practice), we can use the Gait, Arms, Legs, Spine (GALS) screening tool.
A video demonstrating the use of this tool is available on the website of the European Alliance of Associations for Rheumatology (EULAR):
https://www.youtube.com/watch?v=QjqpjRApQok Link 1

When carrying out the GALS test, the patient is first asked three simple questions:

1. Do your muscles, joints, neck and back hurt? Do you feel stiffness in these areas?
Pain and stiffness are among the most common symptoms of musculoskeletal disorders.
2. Can you get dressed without help?
The ability to get dressed independently is a particularly good indicator of the function of the musculoskeletal system.
3. Can you walk up the stairs without difficulty?
Walking is an important indicator of the function of the lower limbs. If we can walk up and down stairs without difficulty, walking on level ground is usually not a problem.

THEN WE DO A QUICK CHECK:

Gait: we observe the patient walking back and forth in the office.
All movements should be symmetrical and smooth, including the accompanying arm swing and the inclination of the spine. We also observe the patient's ability to turn around quickly, which is to be expected in someone without lumbar spine, hip or knee problems.

Inspect the standing patient: From behind, look for symmetry and shape of the shoulder girdle and paraspinal muscles from the head down, as well as the presence of scoliosis or straightened iliacus. Also look for symmetry of the gluteus maximus, popliteal region, calf muscles and Achilles tendon region, as well as swelling or deformity of the feet.
In the lateral view, look for normal cervical lordosis, slight thoracic kyphosis and lumbar lordosis, as well as the absence of deformities in the hip and knee region.

Cervical spine and temporomandibular joint: Ask the patient to tilt their head towards their shoulder, first to one side and then to the other.
This is usually the first movement affected by neck pain syndromes. Then ask the patient to open their mouth wide and move their jaw from side to side. This is an effective test to determine if the temporomandibular joints are affected.

For the **lumbar spine,** ask the patient to bend forward and touch their toes with their knees straight to test flexion in the hips and lumbar spine (Figure 5).
Some people with good hip mobility can bend fully even with limited lumbar spine mobility. Lumbar spine flexion can be easily tested by placing your fingers on the spinous processes of the lumbar vertebrae and bringing your fingers closer together as the person straightens up.

Figure 5. Ask the patient to bend forward

Upper limbs: Ask the patient to place the palms on the back of the head and push the elbows as far back as possible (Figure 6).

This movement requires complete abduction and external rotation of the shoulders, which is restricted in rotator cuff disorders. In addition, uniform flexion of the elbow and movement in the sternoclavicular and acromioclavicular joints indicate the absence of rotator cuff disease. It is also important to determine if the patient can reach their hands up to their head for all daily activities.

Figure 6. Abduction and external rotation in shoulders

Then ask the patient to place their arms to the side with the palms facing forward (anatomical position, Figure 7).

In the anatomical position, we observe the symmetry and shape of the deltoids from top to bottom and the full extension of the elbows.

Next, we ask the patient to bend the elbows at a 90-degree angle and hold the hands in front of them with the palms facing the floor (pronation; Figure 8). Then we ask the patient to squeeze our fingers firmly together, and touch each fingertip with the thumb of the same hand (Figure 9). Finally, we press the fingers together over the metacarpophalangeal joints (Figure 10).

Figure 7. Anatomical position

Figure 8. Pronation of the hands

Figure 9. The finger squeeze test

While examining the patient, we also look for deformities or swelling of the wrists and small joints of the hands, as well as the inability to fully extend the fingers. The proximal and distal radioulnar joints are also tested in supination and pronation. We observe the hands and test the grip and strength of the distal

Figure 10. The metacarpophalangeal squeeze test

muscles, which is important for many activities of daily living. Touching the fingers tests fine motor skills, concentration and accuracy, which are important for many activities of daily living. Compression of the metacarpophalangeal (MCP) joints is important to detect impairment of these joints, which are commonly affected by rheumatoid arthritis. During compression, we observe the subject's face for non-verbal signs of discomfort.

Examine the **lower limbs** by asking the patient to lie on his back on the examination table. Bend one leg at the hip and knee, keeping your hand on the knee, and do the same with the other leg, with the heel touching the buttocks (Figure 11). Check the internal rotation of the hip in flexion. Palpate the knees (Figure 12). Perform the ballottement test (Figure 13). Perform a squeeze test over the metatarsophalangeal joints (Figure 14) *(this is also a test for joints commonly affected by rheumatoid arthritis) and examine the soles of the feet (look for calluses and other irregularities).*

Figure 11. Flexion and internal hip rotation

Figure 12. Knee palpation

Figure 13. The ballotement test

Figure 14. The metatarsophalangeal squeeze test

If any abnormalities are found during the examination, these will be recorded and examined in more detail.

Normal finding in GALS

If there are no abnormalities, the protocol is very simple: no muscle, joint, or spinal pain, no difficulty getting dressed or climbing stairs. Normal gait during the examination. The upper and lower limbs, as well as the spine are well formed and mobile. The GALS screening test is within normal limits.