

Royal Dutch Society
for Physical Therapy



VvOCM
Vereniging van
Oefentherapeuten
Cesar en Mensendieck

KNGF guideline

Rheumatoid arthritis



***KNGF guideline* Rheumatoid Arthritis**

Practice guideline

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The KNGF aims to create the conditions in which high-quality physiotherapeutic care can be provided that is accessible to the entire Dutch population, whilst recognising the professional expertise of the physical therapist. The KNGF represents the professional, social and economic interests of over 19,000 registered physical therapists.

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Table of Contents

A	General information	1
A.1	Introduction	1
A.2	Background of RA	1
A.2.1	Pathophysiology	1
A.2.2	Risk factors for disease development	1
A.2.3	Epidemiological data	1
A.2.4	Consequences of RA and costs to society	1
A.3	Clinical presentation and diagnosis	2
A.4	Medical treatment and disease progression	2
A.5	Prognostic factors for progression	3
A.6	The care and role of the therapist	3
B	Diagnostic process	4
B.1	History taking	4
B.2	Physical examination	6
B.3	Measurement instruments	7
B.4	Determining the indication	8
B.5	Contraindications for exercise therapy	9
B.6	Yellow and red flags	9
C	Therapeutic process	9
C.1	Information and advice	9
C.2	Exercise therapy	10
C.2.1	Indication 1: Instructions for exercise therapy to be done primarily independently	10
C.2.2	Indication 2: Exercise therapy with short-term supervision	10
C.2.3	Indication 3: Exercise therapy with intensive supervision	10
C.3	Frequency, intensity, type and duration of the exercise therapy	11
C.3.1	Frequency	11
C.3.2	Intensity	11
C.3.3	Type	11
C.3.4	Duration	11
C.3.5	General factors	12
C.3.6	Modification of exercise therapy due to comorbidity	12
C.4	Non-exercise therapy interventions	12
C.5	Behavioural interventions for facilitating physical activity	12
C.6	Completion of the therapeutic process	12

Explanation 13

Note 1	Background	13
Note 2	Clinical presentation, diagnosis, medical treatment and disease progression	14
Note 3	Prognostic factors for progression	17
Note 4	The care and role of the therapist	17
Note 5	History taking	19
Note 6	Physical examination	21
Note 7	Measurement instruments	21
Note 8	Determination of the indication and contraindications for exercise therapy, and red and yellow flags	24
Note 9	Information and advice	25
Note 10	Exercise therapy	26
Note 11	Exercise therapy for indication 1	26
Note 12	Exercise therapy for indication 2	26
Note 13	Exercise therapy for indication 3	27
Note 14	Frequency, intensity, type and duration of the exercise therapy	27
Note 15	Frequency	27
Note 16	Intensity	28

Note 17	Type	28
Note 18	Duration	29
Note 19	General factors	29
Note 20	Modification of exercise therapy due to comorbidity	30
Note 21	Non-exercise therapy interventions	30
Note 22	Behavioural interventions for facilitating physical activity	31

Practice guideline

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A General information

A.1 Introduction

The revised guideline on Rheumatoid arthritis (RA) by the Royal Dutch Society for Physical Therapy (KNGF) serves as a guideline for the general physical therapist and exercise therapist (Cesar/Mensendieck) in the treatment of people with RA that has been diagnosed by a rheumatologist.

Where this document refers to therapist/therapy, this can mean either physical therapist/physical therapy or exercise therapist/exercise therapy (Cesar/Mensendieck). In this guideline, the term 'exercise therapy' refers to the exercise therapy intervention and not the profession as practiced by exercise therapists. A number of non-exercise therapy interventions in this guideline are not included in the competency profile of the exercise therapist. If the treating exercise therapist believes that the patient has an indication for such an intervention and the exercise therapist is not trained to perform the intervention, then the patient should be referred to a physical therapist. The interventions in question must always be clearly indicated.

This is the practice guideline. Part A of this practice guideline provides information about the condition, the care that is available and the way in which this care is offered. Parts B and C address the diagnostic process and therapeutic process, respectively, that describe the therapeutic methodology. This practice guideline contains a system of notes, with a more detailed description of the topic (if applicable). A description is also provided of the way the recommendations in this practice guideline and the system of notes were formed.

The justification of this practice guideline contains the literature on which this practice guideline is based and the result of any literature review done per topic.

A.2 Background of RA

[Explanation: see Note 1]

A.2.1 Pathophysiology

Rheumatoid arthritis (RA) is a chronic, systemic inflammatory disease with unknown origin that is primarily localised in the peripheral joints. In addition, the structures around the joints are often affected, such as tendons, bursae and muscle attachment sites. Because RA is a systemic condition, organs such as the skin, heart and

lungs can also be involved in the disease process. In rarer cases,

there may be general symptoms such as fever, malaise and weight loss.

Inflammation of the synovial tissue is also characteristic of RA. The synovium forms the covering layer in parts of the joint that are not covered with cartilage and supplies avascular structures with nutrients. Synovial tissue is also found in the tendons and the bursae. The synovial tissue is greatly thickened and inflamed in RA patients. This hypertrophied synovium is called pannus. Where this inflamed tissue becomes locally ingrown in the transition between the synovium and the cartilage damage to the cartilage and bone develops, a bone destruction that ultimately results in erosions of the bone.

In addition to localised damage, diffuse breakdown of the cartilage occurs. This breakdown is the result of the enzymes produced by the inflamed synovium. Disrupted cartilage production also occurs. Combined, all of this results in a thinner layer of cartilage. Periarticular symptoms that can occur as a result of the thickened or inflamed synovial tissue are bursitis, tendinitis or tendovaginitis.

A.2.2 Risk factors for disease development

RA is generally considered to be an immune-mediated disease with unknown origin. Supposedly, the immune system becomes disrupted due to a combination of genetic predisposition and environmental factors, such as smoking or an infection. In both cases, inflammatory proteins are released that cause other inflammation in the joints.

A.2.3 Epidemiological data

Based on GP registrations, there were an estimated 234,400 people diagnosed with RA in the Netherlands in 2015: 86,200 men and 148,200 women. This translates into 10.3 per 1,000 men and 17.3 per 1,000 women. In 2015 an estimated 17,400 new patients were diagnosed with RA by their GP: 6,600 men and 10,800 women. This translates into 0.8 new patients per 1,000 men and 1.3 per 1,000 women. The number of new patients with RA increases with age, which applies to both men and women.

A.2.4 Consequences of RA and costs to society

RA is an illness that, due to symptoms such as pain, stiffness, fatigue and limited range of motion, can result in limitations in activities of daily living, such as moving about, self-care or household chores and limitations in social participation, such as doing paid or volunteer work and engaging in leisure activities.

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In the first year after diagnosis, 32% of the working patients with RA become either partially or entirely unable to work; after five years this number increases to 45%. In 2015 RA was in 22nd place on the list of disorders in the Netherlands that are responsible for the greatest burden of disease. Health care utilisation for RA is considerable and is paired with substantial costs for the patient, the health care sector and society. The total cost of care for people with RA was EUR 568 million in 2011, with over half of this amount spent on medication and/or aids (51%), 19% going to elderly care, 18% to hospital care and 9% to primary care. Of those RA patients being treated by a medical specialist, 25% to 40% use the services of a physical therapist or exercise therapist every year.

A.3 Clinical presentation and diagnosis

[Explanation: see Note 2]

Clinical presentation

Inflammation of the joints (arthritis) is the main symptom of RA. Characteristic for the onset of RA is a chronic, symmetrical arthritis of primarily the joints of the hands and fingers (metacarpophalangeal [MCP] and proximal interphalangeal [PIP] joints) and feet (metatarsophalangeal [MTP] joints). All other peripheral joints, the jaw (temporomandibular joints) and the atlanto-axial joint (C1-C2) in the neck (cervical spine) can be involved in the disease process. Extra-articular synovial structures, such as ligaments, bursae and tendons, can also be involved in the disease process, such as the bursae around the elbow and the shoulder, the trochanter major of the femur or the Achilles tendon and the flexor and extensor tendons of the hand.

Inflammation of the synovium causes localised pain, swelling and stiffness, which lead to limited range of motion of the affected joints. Joint inflammation can damage the bone and cartilage and the periarticular structures, which in time becomes visible on X-ray as erosive abnormalities or loss of cartilage. In part due to the damage to the collagen structures such as ligaments and tendons (e.g. ruptures), joint instability and/or joint deformation may occur. Due to treatment with medication, the characteristic RA deformities of the fingers and wrist are occurring less and less: in the fingers, the ulnar deviation of the MCP joints, the 'swan neck' deformity (hyperextension of the PIP joint with flexion of the distal interphalangeal [DIP] joint) or the 'boutonnière' deformity (flexion of the PIP joint and hyperextension of the DIP joint), and in the wrist, a misalignment caused by radial sliding of the carpus relative to the radius. One current rare complication is the destruction of the dens and the transverse ligament, whereby subluxation of the first relative to the second cervical vertebra can cause compression of the spinal cord, which can lead to a (sometimes serious) neurological deficit.

In addition to localised pain and stiffness, general symptoms often occur, such as generalised morning stiffness and fatigue. The muscle strength, muscle endurance and aerobic (cardiorespiratory) capacity are generally reduced in RA patients. Relatively frequently RA is paired with Sjögren's syndrome, which is characterised by decreased function of the mucous membranes (dry mouth) and tear ducts (dry eyes). Involvement of the organs, in the form of pericarditis, pleuritis or rheumatoid nodules in the skin,

lungs or heart, is relatively rare. The same applies to inflammation of the blood cells (vasculitis) which, depending on the location and extent of the inflammation, can lead to various abnormalities, such as renal impairment, neuropathies and skin disorders (ulcers). Comorbidity occurs relatively frequently with RA. This can occur as a result of (complications of) the disease and/or medication use and/or can occur independently of RA. Patients with RA have an increased chance of certain lymphomas and infections and – in part related to the inflammatory nature of the disease – an increased cardiovascular risk. In addition, RA patients also have other disorders, just as in the general population. Cross-section research has shown that depression, malignancies, asthma, chronic obstructive pulmonary disease (COPD), osteoporosis, diabetes mellitus and secondary osteoarthritis are frequent co-morbidities (either related to RA or not).

Diagnosis

The RA diagnosis is made by the rheumatologist based on the medical history taking and a physical exam, supplemented by laboratory and radiological tests. In 80-90% of RA patients blood tests show an acute phase response (presence of acute inflammatory protein), characterised by increased C-reactive protein (CRP), increased blood sedimentation, thrombocytosis and anaemia. Rheumatoid factors are found in about 80% of RA patients. There are three types of rheumatoid factors: IgA, IgG and IgM, with the latter being the most frequent. Antibodies against cyclic citrullinated peptides (CCPs) are also found – virtually exclusively in patients with RA. These can be demonstrated with the help of an anti-CCP test. Laboratory testing of synovial fluid is primarily done to rule out other disorders, such as crystal arthritis or septic arthritis. Some time after disease onset, characteristic radiological abnormalities (periarticular decalcification, cartilage loss and erosive abnormalities of the bone) can be demonstrated on X-rays. These characteristic radiological abnormalities are often first seen in the joints of the hands (MCP joints) and the feet (MTP joints). Inflammatory symptoms in the joints (hydrops and capsule swelling) and of the structures around the joints (bursae and tendons) can be shown with the help of echography and magnetic resonance imaging (MRI).

Classification criteria for RA were developed in order to classify the illness, thereby enabling scientific research. These criteria are not suitable for early treatment of patients with RA in daily practice. When a patient presents with joint inflammation that does not (yet) meet the classification criteria, an assessment is made as to whether this is a case of developing RA or another form of arthritis (such as viral arthritis, reactive arthritis or crystal arthritis [or gout], Lyme arthritis or septic arthritis).

A.4 Medical treatment and disease progression

[Explanation: see Note 2]

Medical treatment

The medication used to treat RA to bring about long-term inhibition of the disease activity includes disease modifying anti-rheumatic drugs (DMARDs; e.g. methotrexate), biologicals (e.g. TNF-alpha inhibitors, T and B cell inhibitors and interleukin inhibitors) and corticosteroids. Anti-inflammatory analgesics can be used for pain alleviation – non-steroidal anti-inflammatory drugs (NSAIDs) in oral form or in topical form (ointment, cream).

These can be supplemented by analgesics such as paracetamol as short-acting medication. In addition, intra-articular or intramuscular corticosteroids can be administered to decrease inflammatory activity and alleviate pain. Drug treatment of RA is described in the guideline of the Dutch Society for Rheumatology.

The most frequent surgical interventions in people with RA are joint replacement surgery and correction of deformities (in particular hand or foot surgery).

The pre- and post-operative physical or exercise therapy for the various surgical interventions for RA are outside the scope of this guideline; the surgeon's policy is always guiding for such interventions.

Disease progression

The progression of RA can vary greatly between individuals. With adequate drug treatment, about 30–60% of RA patients experience little to no disease activity (remission), while about 5% have serious progression with persistent inflammatory activity, resulting in structural damage of the joints. The remaining patients have alternating periods of high and low disease activity. The progression is largely determined by the response to the initial treatment with medication and presence of other prognostic factors.

A.5 Prognostic factors for progression

[Explanation: see Note 3]

With RA early treatment with medication can lead to well-controlled disease activity and hence to a favourable disease progression. Predictive factors for an unfavourable progression of disease activity and/or radiological abnormalities with RA are primarily the presence of autoantibodies (rheumatoid factor and anti-citrullinated protein or peptide antibodies [ACPA or anti-CCP]) and the severity of the disease at presentation (high disease activity and radiological abnormalities). Other factors that (can) play a role in the progression are the degree of functional limitations at disease onset, presence of extra-articular symptoms (including pericarditis, nodules, vasculitis and pleuritis), periarticular symptoms (including tendovaginitis, tenosynovitis, bursitis and muscle weakness), lifestyle-related factors (including smoking), abnormalities on the MRI scan or echogram and a certain genetic predisposition.

A.6 The care and role of the therapist

[Explanation: see Note 4]

RA care and organisation of care

People with RA are primarily treated by a rheumatologist, who in most cases works together with a rheumatology nurse. At some rheumatology centres a number of medical tasks are performed by a nurse specialist or a physician assistant, for example prescribing medication or performing joint punctures or injections.

Depending on the healthcare need, the (specialised) physical therapist, exercise therapist, GP, occupational therapist, podiatrist, speech therapist, social worker, psychologist, dietician, medical pedicurist, orthopaedic shoe technician, orthopaedic surgeon, sports medicine physician or rehabilitation physician can also be involved in the treatment. Multidisciplinary treatment is considered if simultaneous involvement of multiple healthcare providers is desirable or necessary and the problem is of a nature that cannot be resolved (or can only be inadequately resolved) by individual healthcare providers.

The role of the therapist

The therapist plays an important role in treating the consequences of RA on the one hand and both RA-related and non-RA-related comorbidity on the other hand. Frequent consequences are: decreased general physical activity, decreased muscle strength, decreased aerobic capacity and limitations in activities of daily living or participation. The therapist must obtain a good idea of the severity and the scope of the disease (based on disease activity and the presence of radiological abnormalities) and the response to treatment with medication.

The therapist counsels the patient on how to prevent or decrease limitations in activities of daily living and social participation due to RA and/or learn how to deal with such limitations. The most important tools for achieving these goals are providing information and advice and exercise therapy. Exercise therapy entails exercises that are related to problems or limitations in functioning that are associated with RA. It also helps patients achieve and maintain a level of general physical activity according to the 'Dutch physical activity guidelines' (see the text box below).

Dutch physical activity guidelines

- Exercise is good; more exercise is better.
- Do at least 150 minutes per week of moderately intensive exercise, such as walking or biking, spread out over several days. Longer, more frequent and/or more intensive exercise has an additional health benefit.
- Perform muscle and bone strengthening activities at least twice per week, combined with balance exercises in the case of elderly patients.
- Avoid sitting still too much.

Source: <https://www.gezondheidsraad.nl>

The therapist draws up an exercise plan together with the patient where the patient specifies which exercises and physical activities he or she does, when, where and for how long.

Integrating exercise and physical activity into daily life increases the chances of maintaining an active lifestyle. Lifestyle recommendations also play a role. These can pertain to self-management with regard to specific exercises that the patient performs independently and general physical activities, but also to working conditions and/or the use of aids and/or adjustments at home or in the workplace.

Exercise therapy under the supervision of a therapist can consist of muscle-strengthening exercises, exercises to promote aerobic capacity and functional forms of exercise, such as walking or hand function training, possibly supplemented with specific balance, coordination and/or neuromuscular training and/or active range of motion or muscle stretching exercises.

Both during the treatment period and upon completion of treatment, the therapist gives the patient explicit advice about how the patient can achieve and maintain an active lifestyle consistent with his or her individual situation. If the patient is being treated by multiple healthcare providers at the same time, then the therapist initiates regular contact with the healthcare providers in order

to coordinate the various treatments with each other. The therapist contacts the other healthcare providers prior to the first and after the last treatment session in any case.

B Diagnostic process

B.1 History taking

[Explanation: see Note 5]

If someone who has been diagnosed with RA sees a physical therapist or exercise therapist in a primary care setting without a referral for physical therapy or exercise therapy (by direct access), then screening takes place in order to determine whether physical therapy or exercise therapy is indicated. The therapist should verify the medical diagnosis and obtain an overview of the complaints and symptoms and determine whether there are any yellow or red flags.

The aim of history taking is to identify health problems, thereby establishing starting points for the treatment. This is done using the International Classification of Functioning Disability and Health (ICF) Core Set for RA, which includes the most relevant aspects for people with RA in the following areas: functions and anatomical characteristics, activities, participation, external factors and personal factors. This ICF Core Set for RA forms the basis for the history taking of patients with RA.

Taking the history provides information about the presence of contraindications (section B.5) and yellow and red flags (section B.6), and it is the therapist's responsibility to decide whether these are a reason for consulting with the GP/physician. The therapist also inquires about risk factors for the onset of RA (see section A.2.2) and prognostic factors for progression (see section A.5). Finally, if applicable, measurement instruments should be used as described in section B.3.

The text box below contains examples of relevant questions when taking a patient's history. The questions can be adapted to suit the therapist's communication style and the patient's communication level.

*Overview of relevant questions when taking the history of patients with RA**

General

- What is the patient's need for assistance? (Patient-Specific Complaints; PSC)
- What are the expectations regarding physical or exercise therapy?
- What are the expectations regarding the progression of the symptoms?

Functions and anatomical characteristics

Is there:

- pain in one or more joints? (Numeric Pain Rating Scale [NPRS]) What is the location of the pain (which joints)? Is the pain related to exertion? What is the progression of the pain in the morning, afternoon, evening or night time?
- inexplicable, persistent severe pain and/or inflammatory symptoms in one or more joints? (Potential red flag)
- morning stiffness and/or start-up stiffness? If so, for how long?
- swelling of one or more joints? If so, which joints?
- limited range of motion and/or stiffness in one or more joints? If so, which joints?
- fatigue? (Numeric Rating Scale for fatigue; NRS fatigue)
- reduced muscle strength? If so, where and during which activities?
- decreased endurance?
- skin problems (ulcers) or nail fold infarcts that may be associated with RA?
- problems when chewing or swallowing?
- dry mouth and/or dry eyes, for example as a result of Sjögren's syndrome
- high blood pressure? (cardiovascular risk factor)
- high cholesterol? (cardiovascular risk factor)
- neck pain and/or pain in the back of the head, in combination with paraesthesia and/or dysesthesia, motor deficit, 'twitching' legs, and/or a sandy feeling in the hands? (neurological symptoms that could indicate a red flag)
- sensory disorders? (potential red flags)
- balance problems? (potential red flags)
- sleep problems?
- sudden increase of symptoms or an acute RA flare-up? (potential red flag)
- severe back pain, possibly after a fall? (potential red flag with osteoporosis and [long-term] corticosteroid use)
- signs of infection somewhere other than in the joints, possibly accompanied by fever and/or general malaise? (potential red flag with the use of biologicals)

Activities (PSC)

- Are there limitations to performing activities of daily living and/or functions such as:
 - changing posture (for example, turning around in bed, getting up from bed, sitting down);
 - self-care, such as getting dressed and undressed, showering, combing the hair (optional measurement instrument for arm and hand function; Quick-DASH);
 - walking (at home or outside), climbing stairs;
 - picking up items from the ground;
 - writing or other fine motor activities;
 - eating and/or drinking;
 - cycling, driving a car or using public transportation;
 - sexual activities.
- Does the patient meet the 'Dutch physical activity guidelines'? (see section A.5.2)
 - If so, with which activities and for how many minutes per week?
 - If not, what is the most important impeding factor? Which degree of physical activity is achieved? With which activities and for how many minutes per week? (optional measurement instrument: accelerometer/pedometer or the MET method).

Participation

- What is the family situation? (in order to assess the daily exertion compared to the capacity)

Are there limitations resulting from the symptoms in:

- relationships and/or social contacts?
- paid or volunteer work? (optional measurement instrument: Work Productivity and Activity Impairment questionnaire [WPAI])
- free time, e.g. when playing sports or engaging in hobbies?
- quality of life (optional measurement instrument: RA Quality of Life Questionnaire [RAQoL])

External factors

- Is there a family history of RA?
- Is there a family history of cardiovascular disease?
- How do the people surrounding the patient (partner, family, friends, co-workers) respond to the symptoms?
- What is the patient's living situation? Are there stairs in the house and how does the patient do climbing these stairs?
- Does the patient use medication? If so, which ones? What is the effect of the medication? Are there side effects? If so, which ones?
- Has the patient previously undergone physical or exercise therapy for RA? If so, what was the result?
- Other than the rheumatologist, is there another medical specialist or other healthcare provider involved with the patient for treating the RA or related comorbidity?
- Does the patient use modifications, aids or facilities for activities of daily living or household tasks? How about at work or during sport or leisure activities?
- Does the patient use a walking aid? If so, what is the effect?
- Does the patient use an aid to perform activities? (standing support, stand-up chair, wheeled stool, knee support)? If so, what is the effect?
- Has any surgery been performed in the past (for example, joint replacement surgery or tendon surgery)? If so, how long ago did this take place and how did the recovery progress?

Personal factors

- What are the patient's views regarding exercise?
- How does the patient handle the complaints in his/her daily life? Among other things, measures the patient has undertaken to influence his/her complaints, such as resting/exercise, and are these helping?

Is there:

- comorbidity? If so, which ones? Does this influence the patient's functional movement and/or exercise capacity?
- overweight? (cardiovascular risk factor)
- smoking? If so, how much does the patient smoke? (cardiovascular risk factor)
- facilitating or inhibiting factors towards exercise? If so, which ones?
- a need for information about RA and the treatment?
- fear, for example of falling?

* Possible contraindications, yellow and red flags, risk factors, prognostic factors and measurement instruments are listed in parentheses.

B.2 Physical examination

[Explanation: see Note 6]

The physical examination of the RA patient consists of evaluating (the quality of) physical activity in relation to the limitations in activities. As with the history taking, this is done using the ICF Core Set for rheumatoid arthritis. The physical examination provides

information about the presence of risk factors for an unfavourable progression (section A.5), contraindications for exercise therapy (section B.5) and yellow and red flags (section B.6), based on which the treatable quantities can be determined. An overview of relevant points of attention for the physical examination of patients with RA is provided in the text box below.

Relevant points of attention during the physical examination of patients with RA

Functions and anatomical characteristics

Inspection

- Where is the pain reported (which joints)? During which movement(s) does the pain occur in the respective joints?
- Is there any swelling of the respective joints? If so, which joint(s) and to which degree (slight, moderate or severe). Is the swelling diffuse or localised?
- Are there changes in position or deformities of the joint(s), in particular the hands, wrists or feet? (see section A.3).

Palpation

- Is there any swelling of the joints or surrounding structures (e.g. tendons, bursae)?
- Is there any temperature increase of the joint(s)?
- Is palpation painful?

Functional examination

- Active movement examination:
 - determination of the range of motion of all joints of the upper and lower extremities and of the cervical spine in all directions;
 - assessment of the combined shoulder and elbow function by having the patient perform several combined movements (for example, the hair combing movement).
- Passive movement examination of the joints with limited range of motion that was determined during the active movement examination

Assessment of:

- the muscle weakness and muscle endurance of the upper and lower extremities;
- the active and passive stability, muscle length and proprioception;
- the static and dynamic balance;
- the sensitivity of primarily the upper extremities (potential red flag);
- the hand function (movement examination), but also coordination, gripping function and the functioning of the flexor and extensor tendons in the hand (including tendon gliding);
- the physical functioning (Six Minute Walking Test (6MINWT)) is a supporting functional test to estimate the physical functioning and to use as a baseline measurement for the treatment);
- the aerobic capacity (for example, with the help of the Borg scale (6–20) or the heart rate).

Activities

Inspection

Assessment of:

- the gait pattern; such as heel strike, ankle function, knee function (is there a flexion contracture, for example?) and hip function (is there a Trendelenburg, for example?), trunk rotation and arm function;
- the quality of movement during functional activities, such as standing, getting up and sitting down, bending, transfers, getting (un)dressed, walking up/down stairs, reaching and gripping, picking something up from the floor and writing;
- specific activities that are restricted during work, sports or other leisure activities;
- use of aids;
- performance of other specific activities where symptoms are reported.

B.3 Measurement instruments

[Explanation: see Note 7]

The measurement instruments that can be applied to patients with RA are systematically linked to the health domains of the ICF.

Recommended measurement instruments

Figure 1a provides an overview of the recommended measurement instruments. These instruments can be applied during the diagnostic phase and when evaluating the treatment in patients with RA if there is a justification for this in practice. Use of a combination of a self-reported questionnaire and a performance-based

test (e.g. the Dutch Consensus Health Assessment Questionnaire and the Six Minute Walking Test) is preferred. All these measurement instruments are available at www.meetinstrumentenzorg.nl.

Optional measurement instruments

The optional measurement instruments are listed in figure 1b. These instruments can be applied during the diagnostic phase and when evaluating the treatment in patients with RA if there is a justification for this in practice. All these measurement instruments are available at www.meetinstrumentenzorg.nl.

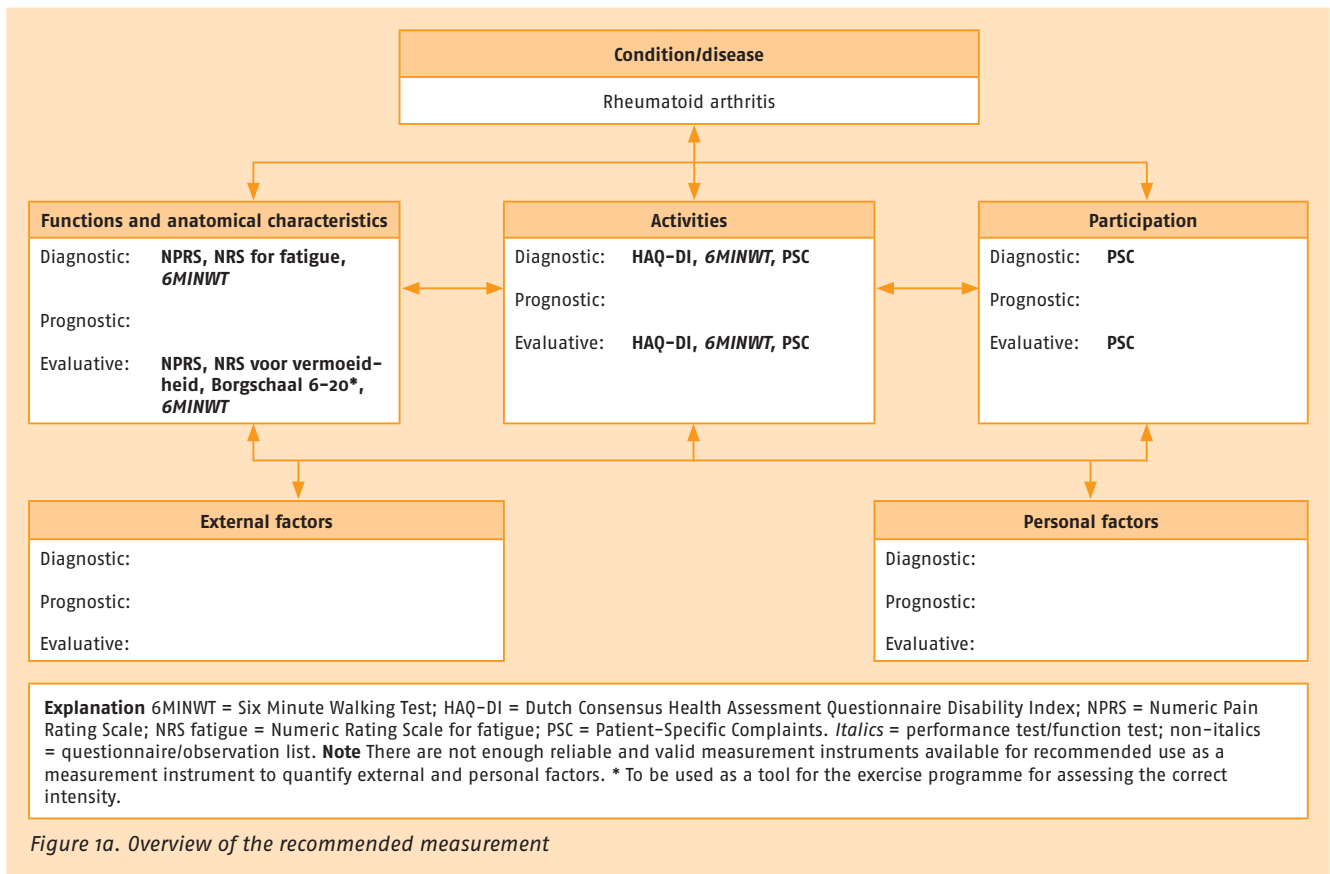


Figure 1a. Overview of the recommended measurement

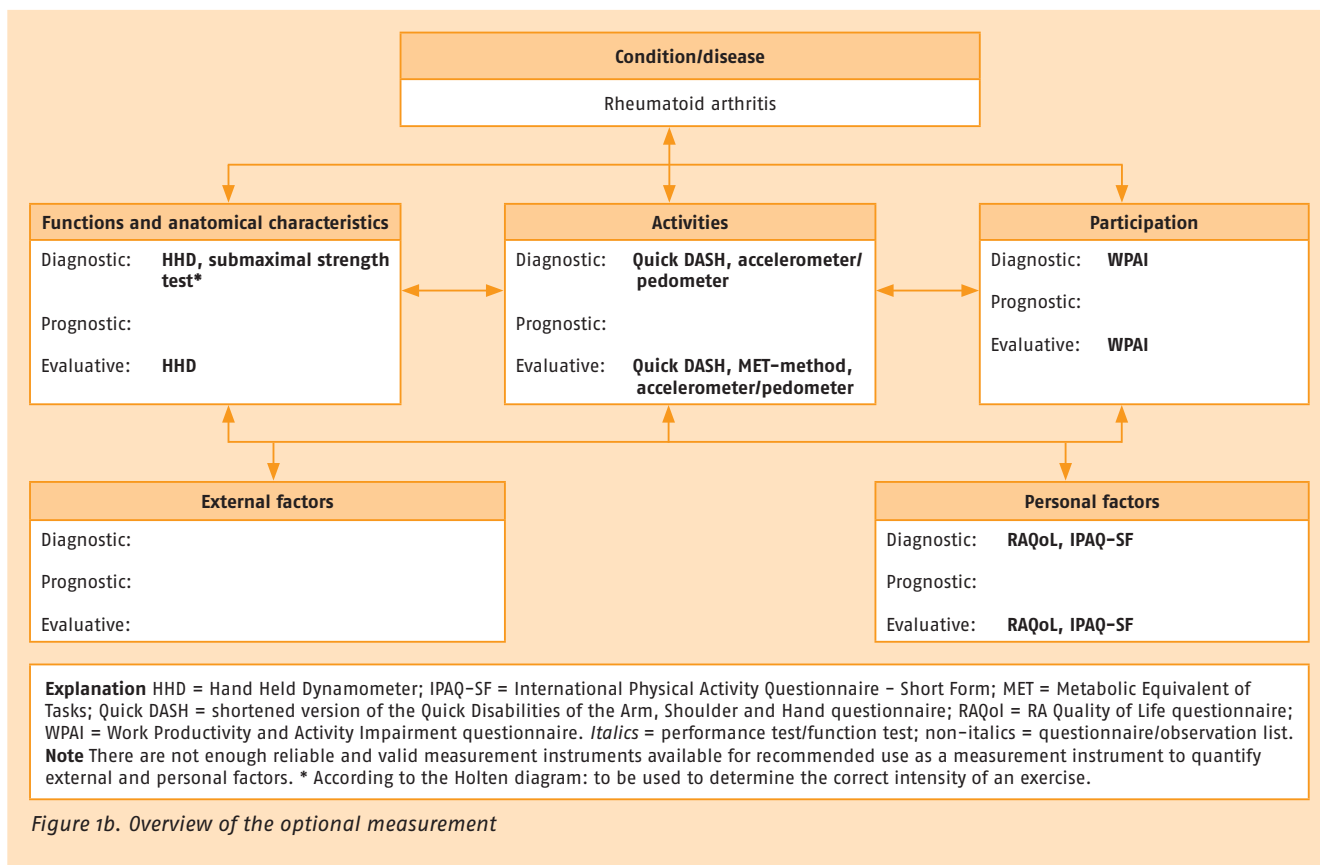


Figure 1b. Overview of the optional measurement

B.4 Determining the indication

[Explanation: see Note 8]

There is an indication for physical therapy/exercise therapy:

- if there is a need for assistance related to limitations in activities of daily living and/or social participation by the patient based on the functional movement;
- and/or
- if the patient is unable to achieve or maintain an adequate level of physical functioning independently. An adequate level is determined by the need for assistance, meets the 'Dutch physical activity guidelines' (see section A.5.2) and assumes an effective coping strategy.

Depending on the patient's health status and the extent to which patients are capable of self-management, we can distinguish between three types of indications.

Indication 1

There is an indication for information, advice and instruction for exercises to be done primarily independently for patients with:

- a need for information, advice, instruction and practical tips during exercise and (a return to) physical activity; and/or
- a need for more insight into the condition, the symptoms and the progression of RA, and the consequences for physical functioning and social participation; and/or

- a need for more information about the physical or exercise therapy treatment options and the patient's own role in this; and/or
- a need for more information about the potential health benefits of appropriate exercises and an active lifestyle and the patient's own role in this; and/or
- a need for more information about the practical possibilities of taking part in regular or adapted types of sports and exercise - independently or with the aid of others (e.g. caregivers, healthcare providers other than the physical therapist or exercise therapist, sports/fitness instructors, etc.) - in order to achieve and maintain adequate levels of physical activity; and/or
- a need for assistance pertaining to aspects such as: limitations in self-management related to physical activity or the availability of exercise possibilities and social support.

Indication 2

There is an indication for information, advice, instruction and exercise therapy with short-term supervision for patients with:

- a need for assistance for RA-related complaints and associated disorders and limitations in activities of daily living and/or social participation that cannot be resolved with short-term information, advice and instruction alone; and/or
- a need for short-term supervision for independently following an exercise programme and obtaining and maintaining sufficient physical activity.

Indication 3

There is an indication for information, advice, instruction and exercise therapy with intensive and/or long-term supervision for patients with:

- limitation(s) in basic activities of daily living and social participation, due to which the patient is unable to independently achieve or maintain an adequate level of functioning; and/or
- high disease activity based on the clinical presentation^a, possibly supplemented with information from the rheumatologist/ rheumatology nurse/physician assistant based on the Disease Activity Score (DAS28; see Note 2, monitoring disease activity); and/or
- severe joint damage; and/or
- severe joint deformations, and/or
- presence of risk factors for delayed recovery that could impede exercise therapy (see section A.4) and comorbidity; and/or
- presence of psychosocial factors (yellow flags) in combination with inadequate (pain) coping strategies.

B.5 Contraindications for exercise therapy

[Explanation: see Note 8]

There are absolute contraindications for exercise therapy in the following RA-related medical situations:

- fever; and/or
- a spinal column fracture; and/or
- arthrogenic instability of the cervical spine; and/or
- a recent tendon rupture (especially for exercise therapy in the area where the rupture occurred).

B.6 Yellow and red flags

[Explanation: see Note 8]

The therapist might indicate yellow and/or red flags. Yellow flags are indications of psychosocial or behavioural risk factors for maintaining and/or exacerbating the health problems related to RA. Red flags are patterns of symptoms (warning signals) which could point to severe pathology and which may warrant additional medical diagnosis. The therapist can point out these yellow and red flags during the screening – based on direct access (without a referral for physical therapy or exercise therapy) – but yellow and red flags can also occur over the course of the treatment.

During treatment, the therapist must take yellow flags into account; but yellow flags can also be a reason to consider – in consultation with the GP – involving another healthcare provider. The pattern of symptoms for RA is specific. The therapist must know this pattern in order to indicate red flags that do not fit this pattern.

a Clinical symptoms occurring with high disease activity are pain, stiffness, loss of muscle function, limited endurance and/or a lack of motor control resulting in a risk of falling

The following text box contains red flags for RA that were collected based on the literature and expert opinion.

Red flags in RA patients

- unintentional weight loss > 5 kg per month (possible sign of malignancy)
- excessive night-time perspiration (possible sign of infection or malignancy)
- warm and swollen (red) joints (possible signs of an infectious inflammatory process of the joint, bacterial arthritis)
- fever or general malaise with the use of biologicals (possible signs of an infectious inflammatory process)
- neck pain or pain in the back of the head, either in combination with 'twitching' legs, and/or a sandy sensation in the hands (possible signs of a myelum compression due to instability of the cervical spine with [sub]luxation of the first or second cervical vertebra)
- motor (paresis or paralysis) and/or sensory deficit (possible signs of polyneuropathy, mononeuritis or vasculitis)
- acute flare-up of RA or sudden increase in symptoms (possible signs of active illness)
- sudden local motor deficit (possible sign of a tendon rupture – of the musculus extensor digitorum communis/ indicis, the musculus extensor pollicis longus or the musculus biceps brachii, for example)
- severe back pain, possibly after a fall (potential spinal column fracture with osteoporosis after long-term corticosteroid use)

The therapist must inform the patient about the encountered red flags. The GP should also be informed about the red flag(s), following consultation with the patient. In addition, the patient may be advised to contact their GP or treating rheumatologist. For a red flag that has been present for a longer time and is known to the patient, GP and/or treating rheumatologist, monitoring its progression is sufficient.

C Therapeutic process**C.1 Information and advice**

[Explanation: see Note 9]

Recommendation Offer RA patients customised information and advice for supporting effective self-management and optimising health and well-being.

Addition The therapist provides information and advice about the disorder and the possible consequences thereof, the importance of exercise and a healthy lifestyle (including decreasing stress and fatigue and the way this lifestyle can be achieved and maintained) and the treatment options.

The following are addressed:

- the favourable effect of physical activity and customised exercises (for improving muscle strength and aerobic capacity) on physical and mental functioning;
- the fact that physical activity has no unfavourable effects on disease activity and radiological damage;
- the preventive and curative effect of sufficient physical activity and limiting sedentary behaviour with RA in connection with an increased cardiovascular risk of this disease;
- the importance of integrating individual exercises and/or physical activities into daily life in order to sustain these exercises and activities.

This information and advice can be provided verbally but should be supported in writing and/or digitally, depending on the wishes, preferences and health literacy skills of the patient. The patient can be referred to various (digital) information sources, to supplement the information and advice provided by the therapist:

- www.defysiotherapeut.com
- www.thuisarts.nl
- www.reumanederland.nl

C.2 Exercise therapy

[Explanation: see Note 10]

The recommendation for exercise therapy for patients with RA is divided into three previously defined indications (see section B.5):

- instructions for exercise therapy to be done primarily independently;
- exercise therapy with short-term supervision;
- exercise therapy with intensive supervision.

C.2.1 Indication 1: Instructions for exercise therapy to be done primarily independently

[Explanation: see Note 11]

Recommendation Consider exercise therapy for patients with indication 1 in the form of instructions for exercises to be done primarily independently. Ensure that exercises are aligned with the patient's need for assistance and adhere to the principles regarding the frequency, intensity, type and duration of the exercise therapy as described in section C.3

Addition Preferably do not apply supervised exercise therapy, and if supervision is necessary, make it short-term, in order to monitor whether the exercise therapy is being performed correctly. Determine the degree of supervision in consultation with the patient. Aim for at most three to six sessions of supervised exercise therapy, spread out over a treatment period of three to six months. The treatments can take place in rapid succession or spread out over a certain period. Exercise therapy is always offered in combination with information and advice (see section C.2) – to facilitate general physical activity – based on the 'Dutch physical activity guidelines' (see section A.5.2).

C.2.2 Indication 2: Exercise therapy with short-term supervision

[Explanation: see Note 12]

Recommendation Offer patients with indication 2 exercise therapy that is aligned with their need for assistance and adhere to the

principles regarding the frequency, intensity, type and duration of the exercise therapy as described in section C.3.

Addition First consider supervised exercise therapy twice per week, supplemented by exercises performed independently.

Exercise therapy is always offered in combination with information and advice (see section C.2) – to facilitate general physical activity – based on the 'Dutch physical activity guidelines' (see section A.5.2).

The supervision is scaled back during the treatment period, if permissible, in consultation with the patient. It is important for the exercise frequency not to decrease; the focus will shift to independent exercising and physical activity.

C.2.3 Indication 3: Exercise therapy with intensive supervision

[Explanation: see Note 13]

Recommendation Consider exercise therapy for patients with indication 3. Ensure that the exercise therapy is aligned with the patient's need for assistance and adhere to the principles regarding the frequency, intensity, type and duration of the exercise therapy as described in section C.3.

Addition In addition to the patient's need for assistance, also tailor the frequency, intensity and time of the exercise therapy to the complexity of the problem.

The complexity of the problem is determined by:

- the response to the treatment with medication; and/or
- the disease activity (expressed in the degree of pain, stiffness, loss of muscle function, limitations in endurance and/or lack of motor control); and/or
- the presence of joint damage; and/or
- the presence of joint deformities; and/or
- the presence of joint prostheses; and/or
- the self-management skills and psychological aspects; and/or
- the presence of lifestyle-related factors for an unfavourable progression (smoking, an inactive lifestyle and being overweight); and/or
- the presence of comorbidity (see section C.3.6).

Maintain and improve, if possible, daily functioning and participation, because these are always a focal point, regardless of the cause of the functioning and participation problems. Because the type and severity of the problem fluctuate, treatment goals must be regularly adjusted and reformulated.

Exercise therapy is always offered in combination with information and advice (see section C.2) – to facilitate general physical activity – based on the 'Dutch physical activity guidelines' (see section A.5.2).

The supervision is scaled back during the treatment period, if permissible, in consultation with the patient. It is important for the exercise frequency not to decrease; the focus will shift to independent exercising and physical activity.

C.3 Frequency, intensity, type and duration of exercise therapy

[Explanation: see Note 14.]

Recommendations have been formulated regarding frequency, intensity, type and duration of the exercise therapy to support the exercise therapy.

C.3.1 Frequency

[Explanation: see Note 15]

Recommendation Aim for the following frequency to also meet the 'Dutch physical activity guidelines' (see section A.6):

- *Muscle strength exercises and/or activities:* Training of a specific muscle group, preferably daily, but at least two days per week. Maintain a recuperation period of 48 hours after intensive muscle strength training for the trained muscle group. Tailor the build-up to the patient's capacity.
- *Aerobic exercises and/or activities:* Preferably daily, but at least five days per week, lasting at least 30 minutes per session. Tailor the build-up to the patient's capacity.
- *Functional exercises and/or activities:* Preferably daily, but at least two days per week. Also incorporate bone-strengthening exercises. Tailor the build-up to the patient's capacity.

C.3.2 Intensity

[Explanation: see Note 16]

Recommendation Aim for the following minimum intensity:

- *Muscle strength training:* 60–80% of 1 repetition maximum (1RM; Borg score 14–17) for people who are used to strength training. Adjust the intensity to 50–60% of 1RM (Borg score 12–13) for people who are not used to strength training. Aim for two to four sets of 8–15 repetitions and a 30–60 second break between sets.
- *Aerobic training:* > 60% of the maximum heart rate (Borg score 14–17) for people who are used to aerobic training. Adjust the intensity to 40–60% of the maximum heart rate (Borg score 12–13) for people who are not used to aerobic training.

Ensure that the intensity is increased gradually throughout the programme and apply the following training principles.

Training principles

- Perform a warming-up before the training and a cooling down after the training.
- Determine the intensity of the muscle strength training and monitor the intensity during the treatment period using the 1RM sub-maximal strength test.
- Gradually increase the intensity of the aerobic training and monitor the intensity during the treatment period using the heart rate and/or Borg score.
- Gradually increase the intensity of the training to the maximum level that is possible for the patient.
- Reduce the intensity of the next training, or have an extra day of recovery, if pain in the joint increases after the training and persists for more than 2 hours.

- Start with a short period of 10 minutes (or less if necessary) for aerobic exercises, for patients who are untrained and/or limited by joint pain and joint mobility.
- Offer alternative exercises that involve the same muscle groups and energy systems, if the exercise results in an increase of joint pain within 10 minutes of the exercise.
- When modifying the training intensity, use variation in sets, repetitions and breaks between sets for muscle strength training and use variation in duration of the exercises, duration of the training and breaks for aerobic training.

C.3.3 Type

[Explanation: see Note 17]

Recommendations

- Offer exercise therapy in a combination of muscle strength training (choose exercises that involve several muscle groups and joints) and aerobic training (choose activities where the patient can train with moderate to high intensity, such as walking, cycling, swimming, rowing and using the cross trainer). **Note** Combine functional exercises (for example, using the patient's own body weight) and exercises on machines with muscle strength training and aerobic training.
- During one treatment session, focus at least 75% of the treatment time on one type of training – muscle strength training or aerobic training – for an optimum treatment result. Instruct the patient to perform the type of training that was not covered in as much detail in the treatment session independently.
- Use functional training: integrate activities into the exercise therapy in which the patient is limited (such as walking, climbing stairs, sitting down in and standing up from a chair, lifting or gripping large and small objects) by practicing (parts of) these activities.
- Consider supplementing the exercise therapy with specific balance, coordination and/or neuromuscular training if there are problems in this area.
- Consider supplementing the exercise therapy with active range-of-motion or muscle stretching exercises, if there are any shortened muscles and/or reversible limitations in range of motion of the joint that inhibit the patient's functioning.

C.3.4 Duration

[Explanation: see Note 18]

Recommendation Aim for a treatment period of three to six months. Supplement the treatment with one or more follow-up sessions. The goal of these sessions is to promote therapy compliance, and they can be scheduled the moment that the scope of the supervised exercise therapy is reduced and independent exercising and physical activity predominate. Encourage the patient to continue exercising and moving independently after the treatment period.

C.3.5 General factors

[Explanation: see Note 19]

Recommendations

- Supervise and encourage the patient during exercise if there are RA-specific barriers, such as pain, stiffness, fatigue and fear (for example, fear of exacerbating the illness).
- For patients with hand problems, consider implementing a specific hand exercise programme. To this end, the patient can be referred to a physical therapist, an exercise therapist or an occupational therapist with specific expertise in the (arthritic) hand.
- Consider offering exercise therapy in water during the initial phase of the treatment, if the patient experiences severe pain during the exercises.
- Consider employing the MET method when assessing the endurance (see section B.2).
- Consider the use of eHealth applications to support the patient in (continuing to) perform(ing) exercises independently and/or reducing the degree of supervision.
- Consider offering exercise therapy in a group setting, if not much individual supervision is required.

C.3.6 Modification of exercise therapy due to comorbidity

[Explanation: see Note 20]

The exercise therapy can be modified if comorbidity impairs physical functioning. In addition to knowledge and skills regarding RA, this modified exercise therapy also requires specific knowledge and skills relating to the individual patient's co-morbidities. The general rule of 'unskilled is unauthorised' applies here. If the treating therapist has insufficient knowledge and skills regarding the patient's comorbidity, then the patient is referred to a therapist who does have sufficient knowledge of this subject.

C.4 Non-exercise therapy interventions^b

[Explanation: see Note 21]

Information and advice and exercise therapy are a priority in the physical or exercise therapy treatment of RA patients. Use of other, non-exercise therapy interventions is generally not recommended.

Recommendation The following interventions should not be offered to patients with RA:

- low level laser therapy;
- electrostimulation (including TENS);
- ultrasound;
- massage;
- thermotherapy;
- medical taping;
- dry needling.

Recommendation Passive mobilisation of joints and muscles should preferably not be offered to patients with RA: Consider short-term passive mobilisation of an affected joint to support

^b With the exception of passive mobilisations, the non-exercise therapy interventions described here are outside the competency profile of the exercise therapist (Cesar/Mensendieck), unless the exercise therapist has been trained in the additional competencies.

exercise therapy only to patients without active inflammation in order to increase joint mobility.

Note Passive mobilisations are contraindicated for cervical problems.

C.5 Behavioural interventions for facilitating physical activity

[Explanation: see Note 22]

Recommendation Offer patients who are not sufficiently physically active behavioural interventions in order to stimulate the degree of physical activity.

Addition When facilitating physical activity, keep in mind the following principles of behavioural change:

- Take into account the phase of behavioural change in which the patient currently is.
- Establish feasible goals together with the patient.
- Give instructions in such a way that the patient understands them and knows what he/she has to do.
- Ensure sufficient variation during the exercise sessions.
- Integrate individual exercises and physical activity into daily life and teach the patient to integrate the individual exercises and physical activities into daily life in order to increase the effectiveness of the exercise therapy.
- Ensure that the patient becomes independent of therapeutic support.
- Help the patient avoid lapsing back into his/her old (inactive) exercise behaviour.
- Inform the patient about improvements and teach the patient to monitor his/her improvements him/herself.
- Involve the people in the patient's environment (partner, children, friends, etc.) in the treatment so as to support changes in the patient's exercise behaviour.
- Encourage the patient to have confidence in his/her own abilities.
- Evaluate what is and what is not effective together with the patient.
- Help the patient to continue aiming for his/her own goals.
- Teach the patient to deal with negative emotions and stress that could impair achieving the set goals.

C.6 Completion of the therapeutic process

The treatment will be completed when:

- the need for assistance has been met and the treatment goals have been achieved; and/or
- interim evaluations reveal that no or inadequate therapeutic effect has been achieved; and/or
- there are contraindications for exercise therapy; and/or
- the patient does not adhere to the therapy, despite various attempts to improve this.

The therapist should advise the patient about how to maintain the goals that have been achieved. The therapist can, for example, give the patient information and advice about maintaining an adequate level of exercise behaviour in daily life.

The treatment is completed according to the current KNGF and VVOCM guidelines on record-keeping and reporting, respectively.

Notes

Note 1. Background

Clinical question

What is the pathophysiology of RA, what are the risk factors for the occurrence of RA, how often does RA occur in the Netherlands and what are the costs to society resulting from RA?

This question was answered by describing the pathophysiology, the epidemiological data and the social costs relating to RA. (Scientific) literature was consulted for this.

Pathophysiology

For a comprehensive description of the clinical presentation of RA, consult the *Leerboek reumatologie en klinische immunologie (Textbook of rheumatology and clinical immunology)* [1] and the *Textbook of Rheumatology* [2].

Risk factors for disease development

RA is based on an auto-immune process of unknown origin. It is suspected that the following risk factors play an important role in the onset of RA: genetic factors (such as the human leukocyte antigens HLA-DR4 and HLA-DRB1), the presence of antibodies against the Fc fragment of immunoglobulins (rheumatoid factors), the presence of anti-citrullinated protein/peptide antibodies (ACPA or anti-CCP) and environmental factors, such as smoking and an infection.[3]. ACPA/anti-CCP are present in 60–70% of RA patients but almost never in patients with other illnesses or in healthy people.[4] ACPA/anti-CCP can be present for a number of years before the RA manifests itself.[5] The presence of rheumatoid factors as one of the diagnostic criteria for RA is described by the American College of Rheumatology (ACR) in 1987[6] and in the ACR/EULAR 2010 classification criteria for RA.[7] Although there appears to be a certain genetic predisposition, an individual person with RA in the family does have an increased chance of getting the disease as well, but in the absolute sense this is only a small chance.

Epidemiological data

RA occurs worldwide. The prevalence among the general world population (men and women) varies from 0.3% to 1.5%. [1,2] The prevalence and incidence numbers of RA in the Netherlands can be found on the website of the Rijksinstituut voor Volksgezondheid en Milieu (RIVM) [Dutch National Institute for Public Health and the Environment] (volksgezondheidzorg.info). [3] These numbers are based on GP registrations and can deviate from the actual incidence and prevalence. Every year in the Netherlands, rheumatologists register some 60,000 diagnosis-treatment combinations (DTCs) for all of their RA patients combined; this concerns both new and existing registrations. [4]

Consequences of RA and costs to society

Compared to a decade ago, RA patients experience on average fewer limitations in their activities of daily living and social participation. This is the result of greatly improved possibilities for treatment with medication, which has also caused patients' need for assistance to focus more on (continued) participation in society and less on performing (basic) activities of daily living, compared to 10 years ago. [1]

In 2015 RA was in 22nd place on the list of disorders in the Netherlands that are responsible for the greatest burden of disease, expressed in the number of disability adjusted life years. [2] The work-related issues regarding RA are still considerable. In the first year after diagnosis, 32% of patients are fully or partially limited in their work activities. After five years this number is 45%. [3,4] Of people aged between 40 and 65 years with an inflammatory rheumatic disorder (including RA), 55% has no employment. [5] The individual working-age patient with RA often experiences a reduction in income due to work-related issues (absenteeism from work or a decrease in hours worked). From the social perspective, this loss of work capacity is paired with significant costs of approximately EUR 1,100 per patient per year. [6]

The individual RA patient incurs healthcare-related costs. This is the patient's excess when incurring healthcare costs and his/her own contribution that must be paid when using certain healthcare services, the costs of self-care medication and all other healthcare-related costs that are not reimbursed or compensated. The majority of patients with RA have annual contact with a rheumatologist due to their RA. In addition, some one-quarter to one-third of all patients use physiotherapeutic or podotherapeutic healthcare or are treated by an orthopaedic surgeon. A smaller portion of patients also see other healthcare providers, such as a social worker, psychologist or occupational therapist. [7] In 2011 the direct additional annual costs for people with an inflammatory rheumatic condition compared to people without a rheumatic condition was EUR 147 for physical therapy, EUR 101 for modifications and aids, EUR 80 for the rheumatology consultant, EUR 71 for other medical specialists, EUR 44 for home care, EUR 34 for the GP, EUR 19 for social work and psychology and EUR 16 for occu-

pational therapy.[6] The total costs for healthcare for people with RA in the Netherlands were EUR 568 million in 2011.[7] This translates into 11% of the total healthcare costs for the musculoskeletal system and connective tissue disorders and 0.6% of the total healthcare costs in the Netherlands. Of the healthcare costs, over half (51%) was devoted to medication and aids. In addition, 19% went to geriatric care, 18% to hospital care and 9% to primary care.[8]

Note 2. Clinical presentation, diagnosis, medical treatment and disease progression

Clinical question

What is the general clinical presentation of RA, how is the RA diagnosis made, what is the medical treatment and progression of RA?

This question was answered by describing the clinical presentation, the diagnosis, the medical treatment and the disease progression of RA. (Scientific) literature was consulted for this.

Clinical presentation and disease progression

RA can occur at any age, but it usually starts between ages 35 and 50.[1] It's an illness primarily characterised by joint inflammation (arthritis). Inflammation of the synovium causes pain and swelling. The swelling leads to loss of function and limited range of motion of the affected joints, and persistent joint inflammation can cause bone and cartilage damage (erosions and joint space narrowing) with deformities of joints and/or instability.[1] Extra-articular synovial structures, such as the bursae and tendons, can also be involved in the disease process and contribute to abnormal positions and instability of joints. In addition to joint problems, general symptoms also occur frequently, such as generalised morning stiffness, fatigue and (in rare cases) fever and general malaise.[2,3] The muscle strength, muscle endurance and aerobic (cardiorespiratory) capacity are generally decreased in patients with RA compared to healthy persons.[4] This can be caused, among other things, by reduced physical activity as a result of pain, stiffness and fatigue, or by RA-related pulmonary and/or cardiovascular abnormalities.[5]

Due to the systemic nature of the illness, various organ systems can be affected over time. An international cohort study with patients from 17 countries published in 2015 showed that depression (15%) was the most frequent comorbidity, followed by stomach ulcers (11%), asthma and COPD (10%), ischemic cardiovascular disease (6%) and tumours (both benign and malignant) (5%).[6] Comorbidity in people with RA can: a) be related to RA, b) be caused by side effects due to long-term medication use or c) occur independently of RA. It is not always possible to determine whether there is a correlation between comorbidity and RA.[7] Literature has shown that patients with RA are at an increased risk of certain lymphomas and infections [8,9] and that the cardiovascular risk in RA patients is increased.[10,11] The risk of cardiovascular disease in RA patients is double that of the healthy population.[12] RA is hence an independent risk factor for cardiovascular disease [13], which is most likely connected to the inflammatory aetiology of RA.[14] Physical inactivity due to the symptoms of the disease (including pain, fatigue and possibly functional limitations) also contributes to the increased cardiovascular risk.[14]

Diagnosis

RA can present clinically in different ways. The RA diagnosis is made by the rheumatologist based on the clinical presentation, with the history taking and the joint examination being the most important clues. In addition to the history taking and the physical examination, laboratory and imaging tests are done.[1] The history taking includes questions about: a) the joint symptoms (pain, swelling, stiffness, limited range of motion, localisations, general morning stiffness, fatigue), b) the course of the symptoms (duration of the symptoms, degree of relapse over the course of time), c) systemic and extra-articular manifestations (including fever, weight loss, skin and nail abnormalities) and d) factors that influence disease symptoms (including comorbidity and risk factors for delayed recuperation).[2,3] Typical for the RA medical history – but not necessarily present – are pain and/or swelling of the small hand and foot joints, limitations in range of motion (for example, a limitation in closing one's fist) with an inflammatory pattern of the symptoms. Such a pattern is characterised by the occurrence of pain and stiffness, especially late at night and early in the morning, which last more than 30 minutes and decrease over the course of the day. RA can also have a more atypical presentation, without a clear inflammatory pattern. In such cases, only the larger joints are involved in the disease process, for example.

Physical examination is aimed, among other things, at which joints are painful and swollen and how many of these there are, the presence of tangential pressure pain of the wrist, MCP, PIP and MTP joints, abnormal positions, range of motion and pain during active and passive joint examination, swelling and/or pain with palpation of periarticular structures in connection with possible bursitis, tendinitis or tendovaginitis, and inspection of the skin and nails in connection with possible rheumatoid nodules, psoriasis (hairy scalp, navel,

natal cleft, nails).[2,3] All joints are inspected for signs of arthritis during the physical exam. The joint capsule is palpated in order to evaluate the degree of pain, swelling and heat. Not being able to identify the joint space due to the swelling is an important characteristic of arthritis. In addition, pressure pain of the joints, pain when moving a joint and painful limited range of motion all contribute to the identification of arthritis.

Using laboratory tests and X-ray images of the hands (images in which the wrists are also visible) and the feet [2], the rheumatologist will try to find substantiation for the RA diagnosis and will conduct a differential diagnosis to determine whether there is a rheumatic disorder other than RA at play, such as (pseudo)gout, reactive arthritis or psoriatic arthritis. An important goal of this additional examination is also to exclude non-rheumatic causes of arthritis. Arthritis can also have an infectious or metabolic (related to a metabolic disorder) cause. In addition, arthritis can occur with malignancies.

Signs of RA in laboratory tests are an elevated sedimentation velocity or an increased amount of C-reactive proteins (CRP) and/or increased autoantibodies, including rheumatoid factors (antibodies against the Fc fragment of immunoglobulins) and anti-citrullinated protein/peptide antibodies (ACPA or anti-CCP).[2,3]

Radiological abnormalities are often first seen in the small joints of the hands (MCP joints) and the feet (MTP joints). Characteristic radiological abnormalities are periarticular decalcification, cartilage loss (narrowing of the joint space) and erosive deviations of the bone. The absence of radiological abnormalities does not rule out an RA diagnosis, however. X-rays are rarely of diagnostic importance with early presentation of arthritis, and these images only serve to determine a baseline situation to which changes can be compared in the long term.

The American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) formulated criteria for classifying rheumatoid arthritis that are related to the involvement of joints, serology, sedimentation and duration of the symptoms (table 2.1).[1]

Although these criteria were originally developed for the purposes of scientific research, they can support the diagnostic process: a complex of symptoms and signs can be classified as RA if at least six of these ten classification criteria are met.

Table 2.1. Classification criteria for RA according to the ACR and the EULAR.

Target group (who should be tested?)	
Patients with:	
1. at least one joint with clear clinical synovitis (swelling);	
2. synovitis that cannot be explained better by another illness.	
Classification criteria for RA (algorithm based on score):	
• Determine the total score of the categories A through D.	
• A score of $\geq 6/10$ is necessary for the classification of a patient with diagnosed RA.	
A. Joint: involvement	
1 large joint	0
2–10 large joints	1
1–3 small joints (with or without the involvement of large joints)	2
4–10 small joints (with or without the involvement of large joints)	3
> 10 joints (at least 1 small joint)	5
B. Serology (at least 1 test result is necessary for classification)	
negative RF and negative ACPA	0
low-positive RF or low-positive ACPA	2
high-positive RF or high-positive ACPA	3
C. Acute phase response (at least 1 test result is necessary for classification)	
normal CRP and normal ESR 0	0
abnormal CRP or normal ESR 1	1
D. Duration of the symptoms	
< 6 weeks	0
≥ 6 weeks	1
ACPA = anti-citrullinated protein; CRP = C-reactive proteins; ESR = erythrocyte sedimentation rate; RF = rheumatoid factor.	

Monitoring of disease activity

An oft-used measurement instrument for assessing the disease activity in patients with RA is the Disease Activity Score (DAS28). This entails: a) the number of painful joints, b) the number of swollen joints, c) the sedimentation or CRP value and d) the disease activity experienced by the patient (Visual Analogue Scale, VAS). With these four components, the DAS28 can be calculated as a number between 0 (no disease activity) and 10 (high degree of disease activity).[2-4] There is remission when the complaints and symptoms of RA disappear and remain subsided for a longer period of time.

Determination of the disease activity

Remission: DAS28 < 2.6

Low disease activity: DAS28 = 2.6-3.2

Moderate disease activity: DAS28 = 3.2-5.1

High disease activity: DAS28 > 5.1

Medical treatment

Once the diagnosis has been made, the rheumatologist will prescribe medication as quickly as possible, which serves to inhibit the inflammation process. If the inflammation decreases, swelling, stiffness when moving and pain will decrease, and there will also be fewer limitations in functional movement. Another important long-term goal is prevention of (progressive) joint damage. With an optimally inhibited inflammation process, the chance of irreparable joint damage decreases, and disability can be prevented. The goal is to achieve a situation of remission without arthritis, with the primary treatment goal (treat-to-target) being the lowest possible score on the DAS28. Usually the disease activity can be quickly gotten under control. However, if medication is not tolerated well or cannot be taken because this would endanger the individual person's remaining health, optimal treatment cannot be provided. RA cannot be gotten under control in a small percentage of people with RA. In such cases, there is a big chance of progressive joint damage due to persistent disease activity [1-3].

Medication for RA should be classified into a number of groups, with disease modifying anti-rheumatic drugs (DMARDs) being the primary group. Examples of DMARDs are methotrexate, sulfasalazine, leflunomide and plaquenil. These drugs have a demonstrable inhibiting effect on the disease process, hence preventing joint damage. They are slow-acting, however, as the effect does not occur for weeks. In order to ensure safe use of these drugs, regular blood checks are necessary. DMARDs can be used as monotherapy, but depending on the disease activity, they can also be combined with corticosteroids, biologicals, non-steroidal anti-inflammatory drugs (NSAIDs) or paracetamol.[3]

Corticosteroids play an important role in RA treatment, with a favourable characteristic being that they quickly and effectively inhibit inflammation. Prednisone is an example of such a corticosteroid. However, corticosteroids have unfavourable side effects when used long term, certainly in higher doses. That is why they are primarily used in the short term: for bridging purposes, in expectation of the effect of the DMARD treatment, as a short course of treatment of a few weeks or as a one-time intramuscular injection to treat a flare-up of the disease or as an injection for arthritis in one or two joints, a situation where adjustment of the dose of the DMARD type is not desired.[3]

The latest development is that of biologicals. They are administered as a subcutaneous injection or by infusion and are usually well-tolerated. These medications inhibit essential mediators in the inflammation process, thereby directly affecting the immune system. However, they are very expensive, and although they seem to be very effective, the difference in effectiveness in a large number of patients is comparable to that of the classic DMARDs, due to which biologicals may only be used when the classic DMARDs don't work or cannot be used due to side effects. A disadvantage of biologicals is that the chance of infection increases because they inhibit the immune system.[2,3]

NSAIDs are anti-inflammatory analgesics. They are often used as supporting analgesics, for example to alleviate pain caused by secondary osteoarthritis or joint damage, or during short-term flare-ups of the disease. Although NSAIDs can inhibit inflammation in the short term, they do not suppress disease activity. This is why they are not suitable as monotherapy. In addition, NSAIDs are not recommended for people with a high cardiovascular risk profile, and they can cause stomach problems, a deterioration of the renal function and an increase in blood pressure, due to which a gastric protector and regular checks of the blood pressure and the blood are indicated with chronic use.[1,3]

Paracetamol has proven to be a safe analgesic within the recommended dosages. The effectiveness on pain, however, is low and paracetamol has no anti-inflammatory effect. Use of paracetamol for pain is recommended and in some cases can decrease the need for NSAIDs, which have a less favourable side effects profile.[1,3]

For checking the effect and safety of the treatment with medication, patients see the rheumatologist for check-ups at regular intervals: two to four times per year, depending on the disease activity.

When evaluating the treatment effect, the rheumatologist often uses the DAS28, a measurement instrument that measures disease activity.[4,5] The results of that measurement instrument can assist with decisions regarding treatment with medication.[2,4] The goal of blood testing is primarily to check for the occurrence of medication side effects; the inflammatory values in the blood are also measured, which in turn are used when calculating the DAS28 score.[2,4,5]

Surgical interventions in people with RA include joint replacement surgeries, arthrodesis, tendon or ligament reconstructions or synovectomies. Joint replacement surgery for serious joint damage can be considered if the treatment with medication and/or other treatments without the use of medication (e.g. physical therapy or exercise therapy) yield insufficient results and pain and loss of function prevail.

Disease progression

The disease progression is different for every patient. In addition to a long-term mild progression (in approximately 30% to 60% of patients) [1], there may also be persistent inflammatory activity (about 5% of patients) [2], or consecutive periods with active disease and dormant phases. In general, a long-term disease progression with persistent inflammatory activity results in joint damage, which in turn causes limitations in (basic) activities of daily living such as self-care. Thanks to (improved) treatment with medication, there are more and more patients with little to no disease activity (remission) who do not incur joint damage and who are able to function almost fully. These are generally patients who respond well to treatment with medication. However, there is still a small group in whom persistent inflammatory activity remains despite the medication, which leads to joint damage and loss of function.

A stable phase is when the RA shows little disease activity over a long period of time or is in remission.[1] In a stable phase, patients have few to no limitations in their basic activities of daily living. They may, however, experience (temporary) limitations in other activities and/or social participation, such as sports, work and leisure activities.

Note 3. Prognostic factors for progression

Clinical question

Which prognostic factors play a role in the progression of the physical functioning of RA?

This question was answered by the describing prognostic factors that play a role in the progression of the physical functioning in people with RA. (Scientific) literature was consulted for this.

The progression of the physical functioning of the RA patient is strongly related to the progression of the disease activity. Predictive factors for a more serious progression of RA are above all the presence of rheumatoid factors and/or antibodies that target anti-citrullinated protein/peptide antibodies (ACPA or anti-CCP) at the onset of the disease. Other factors are a long illness duration, a high degree of disease activity and damage that is radiologically demonstrable. The genetic factors HLA-DR4 and HLA-DRB1, and many limitations in daily life at the onset of the disease, have a negative prognostic value.[1]

Smoking is a risk factor for the onset of RA and is also associated with a decreased response to treatment with medication. Smoking and lifestyle factors such as an inactive lifestyle and being overweight are risk factors that can be changed, and influencing these factors therefore forms a part of the treatment for RA.[2]

The aim is to start the treatment with medication with the most effective dosage possible. Controlled disease activity can lead to a favourable disease progression, with as few limitations as possible in activities of daily living, as few participation problems as possible and the best possible quality of life. A second important factor for a milder RA progression is treatment according to the treat-to-target (TTT) principle.

TTT means setting the treatment goal in advance, such as remission of the illness or low disease activity (based on the DAS28 score), frequent measuring of disease activity (tight control) and prompt adjustment of the treatment if the treatment goal has not been reached. Various studies have shown that treatment according to the hit early-hit hard and TTT principles compared to no TTT/tight control has a more favourable effect on achieving remission, results in more improvement in activities of daily living and has less of a chance of radiologically demonstrable damage, which is also the reason why it is recommended by EULAR.[1]

Note 4. The care and role of the therapist

Clinical question

Which treatment options and organisation of care are recommended for people with RA and what is the role of the physical therapist or exercise therapist in treating patients with RA?

This question was answered by describing which healthcare providers are involved in the care of RA patients (including their tasks and responsibilities) and what the role is of the physical therapist or exercise therapist in treating this patient group. (Scientific) literature was consulted for this.

RA care

Various healthcare providers can be involved in the care of RA patients.

- It's the rheumatologist who makes the RA diagnosis, and it's also the rheumatologist who prescribes medication for the patient (initiation phase) (see Note 2).[1] It is also the rheumatologist's task to monitor the disease activity and adjust the medication, if necessary. The rheumatologist can also involve other healthcare providers, depending on the patient's need for assistance and limitations in activities and participation.
- Almost all rheumatologists work together with a rheumatology nurse or nurse specialist, a nurse practitioner and/or a physician assistant at a hospital outpatient clinic. The rheumatology nurse is specialised in providing information and advice and guiding patients with rheumatic disorders.[2] This includes: providing patients with information and advice on treatment with medication and their possible side effects and providing information about the involvement of other healthcare providers, depending on the need for assistance. The rheumatology nurse also focuses on encouraging a healthy lifestyle (including exercising), protecting joints, active coping and self-management. Often the rheumatology nurse is also responsible for monitoring the disease activity by regularly measuring the DAS28 and keeping track of the score. Guidance and healthcare by the rheumatology nurse are often offered in the outpatient clinic. The nurse specialist and physician assistant work as independent healthcare professionals, with patient care being guiding, as opposed to separate medical action. The competencies and healthcare tasks of both healthcare providers are comparable but can differ, depending on the setting in which they work. The nurse specialist or physician assistant can take over some (medical) subtasks from the rheumatologist (shifting of tasks), such as prescribing medication, administering an intra-articular injection and doing an arthroscopy.[3]
- The GP can play an important role as a referrer to the rheumatologist, in detecting RA and its complications at an early stage of the disease or in treating infections, should these occur.
- The physical or exercise therapist focuses on giving instructions and customised support during an exercise programme that is tailored to the individual patient's symptoms and limitations and facilitates healthy exercise behaviour.[4]
- The occupational, physical or exercise therapist specialised in hand problems can be involved in both conservative as well as post-operative treatment (after a joint replacement and corrective operation).
- The speech therapist focuses on treating speech problems, swallowing disorders and eating and drinking issues that are the consequence of orofacial problems. The speech therapist can also provide voice therapy.
- The occupational therapist aims to improve the patient's independent functioning in the environment that is relevant to the patient. Occupational therapy is aimed at the question of whether adjustments are needed in the area of self-reliance (bathing/dressing), productivity (work) and leisure activities (hobbies/sports), living situation (living environment) and mobility (traveling by car/public transportation/bike). In addition, the occupational therapist gives advice about aids (joint protection) and orthoses.
- The podiatrist examines the foot, ankle and walking function in cases of foot problems and draws up a treatment plan based on this. Making special shoe inserts and giving shoe advice and information can also be a part of the podiatrist's tasks.[4]
- The dietician can give advice about healthy nutrition to facilitate a healthy lifestyle for overweight patients. Although being overweight appears to have some influence on the pathogenesis [5], nothing is known yet about specific nutrition that could have a favourable effect on the disease progression.
- The social worker aims to facilitate active coping and self-management and decrease participation problems for patients with psychosocial, work-related and financial problems. In addition, the social worker can provide practical support for financial and other issues in the area of social and societal functioning. The psychologist can help RA patients learn to accept and deal with their illness. The psychologist can assist the patient and his/her family with: a) learning to cope with the illness and its consequences, including the emotional aspects; and b) facilitating the patient's independence.
- The orthopaedic or plastic surgeon performs joint replacement surgeries, if indicated. However, hand surgery (joint replacement in the hand, ligament reconstruction, arthrodesis or synovectomy) is done by an orthopaedic or plastic surgeon who specialises in the hand.
- The rehabilitation physician deals with the consequences of RA for the musculoskeletal system that can result in limitations in activities and participation. The rehabilitation physician is particularly involved in the healthcare if multidisciplinary treatment is indicated and ensures adequate multidisciplinary referral and its coordination in collaboration with the rheumatologist.

Organisation of care

If organised, structural cooperation between various disciplines is in place for a patient (including structural multidisciplinary consultation), then this is considered multidisciplinary treatment. A multidisciplinary team typically consists of a rheumatologist, a rehabilitation physician, a nurse (e.g. a rheumatology nurse/consultant or nurse specialist), a physical or exercise therapist, an occupational therapist and a social worker (the composition of the team changes per treatment location). In some situations other healthcare providers will also be a part of the team, such as an orthopaedic or plastic surgeon, a dietician or a psychologist. The rehabilitation physician or rheumatologist coordinates the multidisciplinary treatment.

Multidisciplinary care is offered both in a hospital as well as in an outpatient treatment setting, in specialised rheumatology clinics, rehabilitation centres or general hospitals. Other than the more general multidisciplinary care, there are also multidisciplinary joint ventures in place at various institutions that focus on specific areas, such as hand and foot problems, problems of the cervical spine or work issues. In most cases, a (specialised) physical or exercise therapist is also part of such a team.

Note 5. History taking**Clinical question****Which ICF domains should be quantified during the diagnostic process?**

This question was answered by describing the domains from the International Classification of Functioning Disability and Health (ICF) Core Set for Rheumatoid Arthritis, which are relevant to taking a history, divided according to functions and anatomical characteristics, activities, participation, external and personal factors.[1] The personal factors component has been determined by members of the guideline panel because this component is not elaborated into domains in the ICF for RA.

The ICF Core Set for rheumatoid arthritis indicates the range of limitations of RA patients and has been validated from the physical therapist's perspective. It forms the foundation for taking the history of patients with RA. The aim of the diagnostic process is to identify the severity, nature and degree of the ability to influence the health problem. Taking the history is a part of this. The starting point is the need for assistance formulated by the patient. The therapist identifies the need for assistance and the related health problems using the ICF Core Set for rheumatoid arthritis. See figure 5.1.

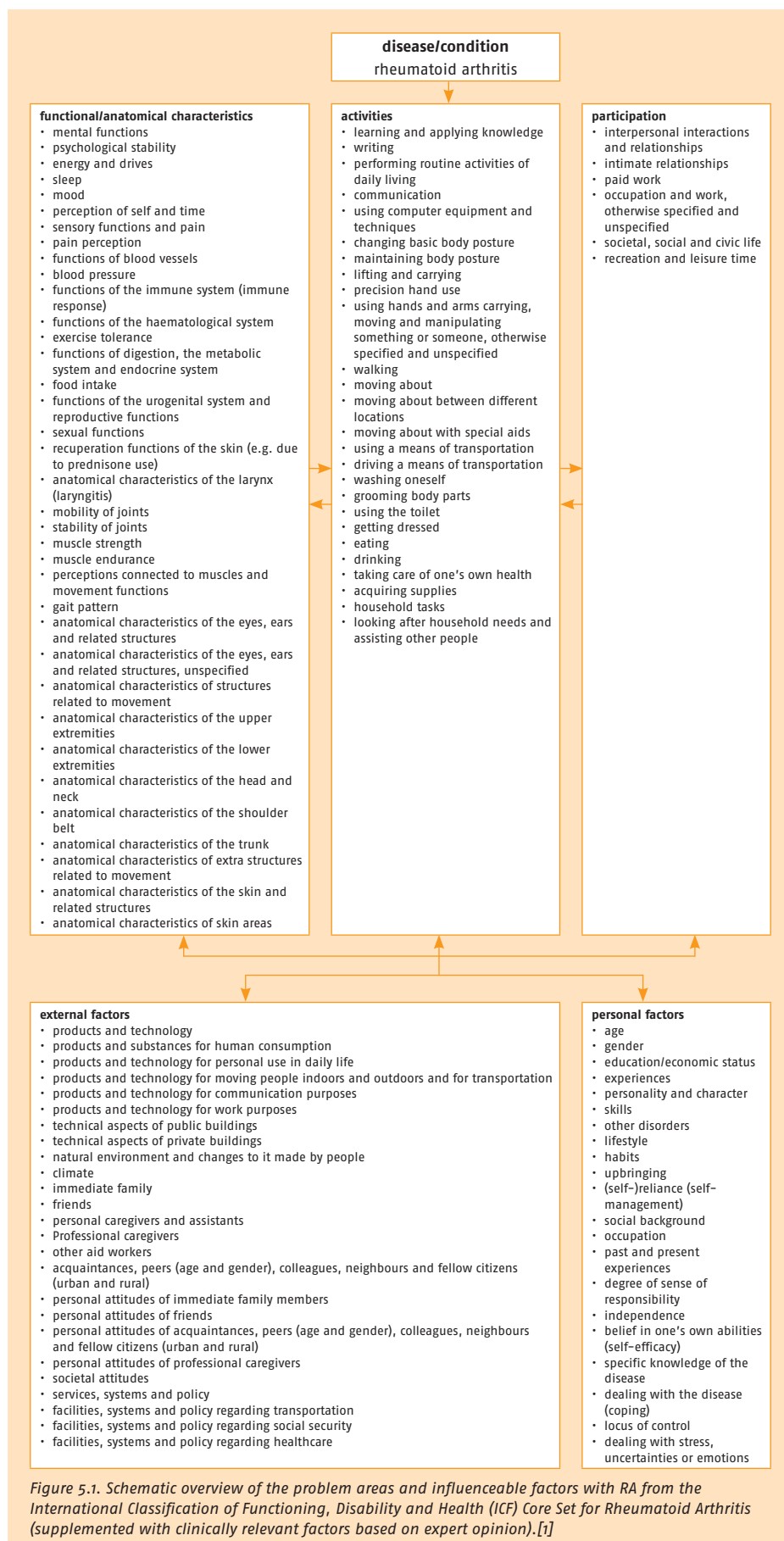


Figure 5.1. Schematic overview of the problem areas and influenceable factors with RA from the International Classification of Functioning, Disability and Health (ICF) Core Set for Rheumatoid Arthritis (supplemented with clinically relevant factors based on expert opinion). [1]

The therapist also identifies any contraindications and red or yellow flags. These should be taken into consideration during the treatment. The yellow flags can also be a reason to consult with the (general) practitioner about seeking the assistance of another healthcare provider (see the current KNGF and VvOCM guidelines about record-keeping and reporting, respectively).

The risk factors for the development of RA and the prognostic factors for progression should also be discussed. When taking the history, measurement instruments can be used to support the process.

Note 6. Physical examination

Clinical question

What is the advice regarding which ICF domains should be quantified during the diagnostic process?

This question was answered by describing the domains from the International Classification of Functioning Disability and Health (ICF) Core Set for Rheumatoid Arthritis that are relevant to the physical examination, divided according to functions and anatomical characteristics, activities, participation, external and personal factors.[1]

The history taking resulted in the formulation of hypotheses that describe which possible causes there are for the patient's existing disease symptoms and complaints. During the physical examination the hypotheses are tested with the goal of obtaining a clearer picture of the severity of the patient's disease symptoms and complaints. To determine the severity of the disease symptoms, the joints are assessed for swelling, pain during palpation, pain during movement, limited range of motion, deformities and instability. These symptoms are characteristics of RA and occur at different stages of the disease and can influence the functioning of the RA patient.[2-4]

It is important to evaluate not only the joints and periarticular structures where the patient indicates he/she has problems but all joints, given that inflammatory activity can also occur in places where the patient has no complaints. Hands and feet are often involved in the disease process.[5-8] However, the disease process doesn't merely include the peripheral joints; this means that the cervical spine and the jaw joints should also be examined, for example.[3,4]

The physical exam can be expanded with an evaluation of the cardiorespiratory exercise capacity, the muscle strength and neurological symptoms, such as sensibility disorders with possible motor deficit (for demonstrating or excluding general and specific RA-related red flags).[3,4]

Due to fluctuations in disruptions of functions and anatomical characteristics, limitations in activities of daily living and participation problems can be highly susceptible to change during disease progression. It is therefore important to focus on limitations in activities of daily living during the diagnosis and continue checking this frequently. The fluctuations in physical load capacity impact the dosing and the intensity of the exercise therapy.[2]

Note 7. Measurement instruments

Clinical question

Which measurement instruments are recommended during the diagnostic phase and the evaluation of RA patients?

This question was answered by describing the recommended and optional measurement instruments that can be used during the diagnostic process. The Framework for Evidence-Based Products was used for this.[1]

The recommended measurement instruments^c for supporting the diagnostic process and evaluating the treatment in RA patients are:

- a Numeric Rating Scale (NRS) for fatigue;[2]
- a Numeric Pain Rating Scale (NPRS);[2]
- the Borg Rating of Perceived Exertion Scale (Borg RPE scale 6-20);[3,4]
- the Dutch Consensus Health Assessment Questionnaire Disability Index (HAQ-DI);[5,6]
- the Patient-Specific Complaints (PSC); [7]
- the Six Minute Walking Test (6MINWT).[8-10]

When assessing the various aspects of physical functioning, preference is given to a combined application of a self-reported questionnaire and a performance-based test.

^c These measurement instruments are not elaborated upon because they are assumed to be known.

Optional measurement instruments can be chosen based on clinical reasons for supporting the diagnostic process and for evaluation.

Optional measurement instruments are:

Functions and anatomical characteristics

- The Hand Held Dynamometer (HHD). This measurement instrument can be used to measure grip strength as a gauge for the general muscle strength.[11]
- A submaximal strength test. This test should be used to determine the training intensity if a weight lifting machine is used during the muscle strength measurement.[12-14] For example, a submaximal 1RM test, where 1RM can be estimated with the help of the Holten diagram.[25]

Activities

- The Quick DASH can be used to determine the degree of limitations in the entire upper extremities if there are complaints of the shoulder and/or arm and/or hand.[15,16]
- The accelerometer or pedometer can be used to evaluate physical activity during the day or week. The accelerometer is suitable for supporting the facilitation of an active lifestyle, for example in order to comply with the exercise guidelines.[17]
- The MET method shows the metabolic load of various motor activities and can be used to estimate the patient’s exercise capacity.[18]

Participation

- The Work Productivity and Activity Impairment questionnaire [WPAI]). This questionnaire can be used if you want to know the extent to which health problems resulting from RA impede specific aspects of work performance.[19]

Personal factors

- The Rheumatoid Arthritis Quality of Life (RAQoL). This questionnaire can be used to get an idea of the quality of life and to what extent quality of life is influenced by the treatment. The RAQoL is suitable for the ‘quality of life improvement’ goal.[20]
- The International Physical Activity Questionnaire – Short Form (IPAQ-SF) is the shortened version of the IPAQ. The IPAQ-SF can be used to estimate the activity level.[21,22]
- Compliance with the exercise guidelines. An evaluation can be performed to see whether someone meets the ‘Dutch physical activity guidelines’.[23]

Table 7.1 offers an interpretation, per measurement instrument, of the outcome and the clinically relevant difference as a gauge for monitoring the progress of the treatment. The clinically relevant difference is based on the minimal clinically important difference (MCID) for RA patients. If the MCID with RA is unknown, the MCID for another patient population is given or – based on the literature – the MCID is 30%.[24]

Table 7.1. Selected measurement instruments with accompanying interpretation and clinically relevant differences. All measurement instruments are available via www.meetinstrumentenzorg.nl.

Measurement instrument	Interpretation/clinically relevant difference
functions and anatomical characteristics	
Numeric Rating Scale (NRS) for fatigue	<ul style="list-style-type: none"> • A higher score corresponds to a higher degree of fatigue. • Clinically relevant difference: 2 points on the scale of 0-10.
Numeric Pain Rating Scale (NPRS)	<ul style="list-style-type: none"> • A higher score corresponds to a higher degree of fatigue. • Clinically relevant difference: 2 points on the scale of 0-10.[8]
Hand Held Dynamometer	<ul style="list-style-type: none"> • A higher score corresponds to more strength. • Clinically relevant difference based on other patient populations: 19.5% • Clinically relevant difference: unknown for RA, but see table 7.2 for the standard values based on other patient populations.

Table 7.1. Selected measurement instruments with accompanying interpretation and clinically relevant differences. All measurement instruments are available via www.meetinstrumentenzorg.nl. (continued)

Measurement instrument	Interpretation/clinically relevant difference
Submaximal strength test	<ul style="list-style-type: none"> Interpretation and clinically relevant difference do not apply, because this is a measurement instrument to determine and monitor the training intensity.
Borg RPE scale	<ul style="list-style-type: none"> Measured on a scale of 6–20 points. Interpretation and clinically relevant difference do not apply, because this is a measurement instrument to determine and monitor the training intensity.
Activities and participation	
Dutch Consensus Health Assessment Questionnaire Disability Index (HAQ-DI)	<ul style="list-style-type: none"> A higher score corresponds to more limitations. Clinically relevant difference: 0.20–0.22 units on a scale of 0–3.
Six Minute Walking Test (6MINWT)	<ul style="list-style-type: none"> The more metres covered, the better the functioning. Clinically relevant difference based on other disorders: 25–50 metres. Calculation of standard values: distance = $218 + (5.14 \times \text{height [cm]} - 5.32 \times \text{age}) - (1.80 \times \text{weight}) + 51.31 \times \text{gender}$ [1 = male, 0 = female]. Preconditions for the use of this formula: the length of the course is 50 m.
Patient-Specific Complaints (PSC)	<ul style="list-style-type: none"> A higher score corresponds to more difficulty performing the activity. Clinically relevant difference: 2 points on the scale of 0–10.
Quick Disabilities of the Arm, Shoulder and Hand (Quick-DASH)	<ul style="list-style-type: none"> Clinically relevant difference based on the literature: 30% for the individual patient.
The accelerometer/ pedometer	<ul style="list-style-type: none"> Interpretation and clinically relevant difference do not apply, because this is a measurement instrument to determine the physical activity during the day.
MET method	<ul style="list-style-type: none"> Interpretation and clinically relevant difference do not apply, because this is a measurement instrument to estimate the intensity of motor activities.
Work Productivity and Activity Impairment questionnaire [WPAI])	<ul style="list-style-type: none"> For RA patients the important thing is not the total score but to identify the number of hours these patients miss at work due to symptoms and the impact of symptoms on their work and on activities of daily living on an NRS scale, with a higher score indicating more influence of the symptoms. Clinically relevant difference based on the literature: 30% for the individual patient.
Personal factors	
Rheumatoid Arthritis Quality of Life (RAQoL)	<ul style="list-style-type: none"> Measured on a scale of 0–30. A higher score corresponds to a lower quality of life. Clinically relevant difference based on the literature: 30% for the individual patient.
International Physical Activity Questionnaire Short Form (IPAQ-SF)	<ul style="list-style-type: none"> For RA patients the important thing is not the total score but to identify the number of hours per day these patients spend engaged in moderate to heavy physical activity and how many hours they spend sitting.
Dutch physical activity guidelines	<ul style="list-style-type: none"> Perform moderately intensive exercise at least 5x per week for 30 minutes. 2–3x per week muscle and bone strengthening activities.

Table 7.2. Minimally acceptable grip strength pre-operatively per age and gender at 85% of the normal level.

age (years)	female (kg)	male (kg)
15	28	42
20	29	43
25	30	44
30	30	45
35	30	45
40	30	45
45	30	45
50	29	45
55	28	44
60	27	43
65	25	41
70	23	39
75	20	37
80	18	35
85	15	32
90	11	29
95	8	26

Note 8. Determination of indications and contraindications for exercise therapy, and red and yellow flags

Clinical question

When is physical or exercise therapy indicated in people with RA and based on which criteria and/or red flags should people with RA be referred back to the GP or treating specialist?

This question was answered by describing the indications for physical therapy and exercise therapy for RA patients and the red flags and contraindications that apply to treatment. (Scientific) literature was consulted for this.

Determining the indication

The physical therapy or exercise therapy treatment and in particular exercise therapy are recommended in various (inter)national guidelines and standards for the treatment of people with RA.[1–7] None of these guidelines is specific about the indications and contraindications for physical and exercise therapy for this condition. In practice, therapy can be used to meet various needs for assistance from these patients. A distinction is made between needs for assistance relating to education (information and advice) about the condition, the progression of RA and the treatment – particularly the role of self-management – specific exercises aimed at increasing muscle strength and aerobic capacity and achieving and maintaining adequate levels of general physical activity. However, none of the guidelines or healthcare standards specifically describe when the therapy should be implemented and which distinction should be made in the nature, duration, frequency or intensity based on the underlying need for assistance or problems.

The most relevant recommendations in the EUMUSC.NET 'Standards of Care' for RA are as follows:

- RA patients should receive information and advice about a healthy lifestyle, including physical activity.
- RA patients should receive information about the positive effects exercises have on decreasing cardiovascular risk factors, maintaining mobility of the joint and preventing decreased muscle strength.
- RA patients should receive professional advice and professional guidance when exercising (such as cardio-respiratory and vascular training and muscle strength training) specific to their situation (involvement of joints in the disease process) and adapted to the patient's general health status.

Contraindications for exercise therapy

There may be contraindications for exercise therapy that are directly related to RA, or a contraindication that is related to a possible comorbidity. Absolute contraindications for exercise therapy in patients with RA are: fever,

a vertebral fracture, arthrogenic instability of the cervical vertebral column and a recent tendon rupture. A tendon rupture is especially a contraindication for exercise therapy in the area where the rupture occurred. Fever, a (possible) vertebral fracture and (possible) instability of the cervical vertebral column are always a contraindication for exercise therapy as well as a red flag.

Yellow and red flags

An important aspect within the screening is the evaluation of whether the symptoms are 'OK' or 'not OK'. The therapist will aim to identify any red flags. The conclusion 'OK' or 'not OK' is made by the individual therapist, based on his/her perspective. If the therapist reaches the conclusion 'not OK', then the patient is informed about this and is referred (back) to the (general) practitioner. See also the current KNGF and VvOCM guidelines on record-keeping and reporting, respectively. The red flags for physical and exercise therapy with RA focus on the consequences of cervical instability, among other things. [8,9]

Note 9. Information and advice

Clinical question

What are the recommendations for providing information and advice to RA patients?

Conclusion from the literature study

The following recommendations are formulated in the international guideline for providing information and advice to patients with inflammatory rheumatic disorders by the European League Against Rheumatism (EULAR):[1]

- Providing information and advice is an interactive learning process developed to support patients and help them manage their lives with their condition and optimise their health and well-being.
- Communication and joint decision-making between the patient and healthcare provider are essential in order to provide information and advice effectively.
- Providing information and advice must be an integral component of the offered care in order to facilitate patient involvement in disease management and a healthy lifestyle.
- Each patient must receive (access to) information and advice during the entire disease process, but in any case when diagnosed, if there are changes in treatment with medication and if there are physical and/or mental problems.
- The content and type of the information and advice must be customised to the patient's needs.
- Information and advice should be offered face-to-face or online, individually and/or in group sessions, if needed supplemented with telephone contact and information on paper or through multimedia.
- Information and advice programmes must be based on theoretic frameworks and must be evidence-based, for example, self-management, cognitive behavioural therapy and stress management.
- The effectiveness of the information and advice must be evaluated and the selected outcome measures must be aligned with the goal of the information and advice provision.
- Information and advice must be provided by a competent healthcare provider and/or trained experience expert, if applicable in a multidisciplinary team.
- Healthcare providers who provide information and advice must have access to and make use of specific opportunities to advance their expertise, in order to have the necessary knowledge and skills.

When facilitating self-management, information and advice about a healthy lifestyle is of great importance. A healthy lifestyle has overall positive health effects and is also relevant to decreasing cardiovascular risk in patients with RA and must therefore be an integral part of the information and advice provided to this patient group.[2,3]

From evidence to recommendation

Based on the literature, the guideline panel formulated a recommendation regarding information and advice.

Recommendation

Offer RA patients customised information and advice for supporting effective self-management and optimising health and well-being.

Note 10. Exercise therapy

Clinical question

Is exercise therapy recommended for RA patients?

To answer this clinical question, a search was performed after which the literature was split into the following:

- exercise therapy for indication 1: studies in which the exercise programme was unsupervised at least 50% of the time;
- exercise therapy for indication 2: fully supervised exercise therapy; and
- exercise therapy for indication 3: fully supervised exercise therapy for patients with serious disease progression and/or comorbidity.

When evaluating the literature and the 'from evidence to recommendation' process, a differentiation was made between indication 1 (see Note 11), indication 2 (see Note 12) and indication 3 (see Note 13).

Note 11. Exercise therapy for indication 1

Clinical question

Is exercise therapy recommended for patients with indication 1?

Conclusion from the literature study

The literature shows a moderate to large effect of exercise therapy with limited supervision on the (crucial) outcome measures 'quality of life', 'physical functioning' and 'pain' compared to no exercise therapy with limited supervision. The quality of evidence varies from very low to low.

The literature also shows a slight effect of exercise therapy with limited supervision on the outcome measure 'muscle strength' compared to no exercise therapy with limited supervision, with the quality of evidence being reasonable. The effectiveness of exercise therapy with limited supervision on 'fatigue', 'range of motion' and 'work productivity' is unknown.

Undesirable effects of exercise therapy for indication 1, or increased pain, increased disease activity and/or radiological damage could be excluded.

From evidence to recommendation

Based on the desired effects of exercise therapy for indication 1 and the lack of undesirable effects, the probability of cost-effectiveness and the high degree of acceptability and feasibility of exercise therapy for indication 1, the guideline panel believes that exercise therapy can be considered for indication 1.

Recommendations for exercise therapy for indication 1

Consider exercise therapy for patients with indication 1 in the form of instructions for exercises to be done primarily independently. Ensure that exercises are aligned with the patient's need for assistance and adhere to the principles regarding the frequency, intensity, type and duration of the exercise therapy as described in section C.3.2.

Note 12. Exercise therapy for indication 2

Clinical question

Is exercise therapy recommended for patients with indication 2?

Conclusion from the literature study

The literature shows that the effect of supervised exercise therapy on the (crucial) outcome measures 'quality of life', 'physical functioning' and 'pain' are large, moderate and slight, respectively, compared to 'no treatment'. The quality of evidence of these studies is respectively low, moderate and very low. The literature also shows a large effect of supervised exercise therapy on 'muscle strength' and 'range of motion' and a moderate effect on 'aerobic capacity', compared to no supervised exercise therapy, although the quality of evidence is low to moderate. The effect of supervised exercise therapy on 'fatigue' and 'work productivity' is unknown.

Undesirable effects of exercise therapy for indication 2, or increased pain, increased disease activity and/or radiological damage could be excluded.

From evidence to recommendation

Based on the large desired effects of exercise therapy for indication 2 (with a reasonable quality of evidence)

and the lack of undesirable effects, the expectation that patients will view exercise therapy in a positive light due to the desired effects thereof and the high degree of acceptability and feasibility of exercise therapy for indication 2, the guideline panel believes that exercise therapy can be strongly recommended for indication 2 ('offer exercise therapy').

Recommendations for exercise therapy for indication 2

Offer patients with indication 2 exercise therapy that responds to their need for assistance and adhere to the principles for the frequency, intensity, type and duration of the exercise therapy as described in section C.3.2.

Note 13. Exercise therapy for indication 3

Clinical question

Is exercise therapy recommended for patients with indication 3?

Conclusion from the literature study

No studies were found where the effectiveness of exercise therapy was evaluated in patients with complex problems (multimorbidity).

From evidence to recommendation

The guideline panel deems it probable that the desired effects of exercise therapy for indication 3 outweighs the undesirable effects, based on practical experience.

In addition, exercise therapy for indication 3 is considered acceptable and feasible by the guideline panel.

Based on this, the guideline panel believes that exercise therapy can be considered for indication 3.

Recommendations for exercise therapy for indication 3

Consider exercise therapy for patients with indication 3. Ensure that the exercise therapy responds to the patient's need for assistance and adhere to the principles for the frequency, intensity, type and duration of the exercise therapy as described in section C.3.2.

Note 14. Frequency, intensity, type and duration of the exercise therapy

Clinical question

Which frequency, intensity, type and duration of the exercise therapy interventions is recommended for patients with RA?

To answer this clinical question, a search was performed after which the literature was split into the various FITT factors. The results are supplemented with the findings from the exercise therapy guidelines for arthritis by the American College of Sports Medicine (ACSM).[1]

When evaluating the literature and the 'from evidence to recommendation' process, a differentiation was made between the frequency (see Note 15), the intensity (see Note 16), the type (see Note 17) and the duration (see Note 18) of the exercise therapy.

Note 15. Frequency

Clinical question

Which frequency of the exercise therapy is recommended for patients with RA?

Conclusion from the literature study

The literature shows a large effect of exercise therapy with a frequency of two times per week on the outcome measures 'quality of life' (low quality of evidence) and 'physical functioning' (reasonable quality of evidence). The effect of exercise therapy with a frequency of three times per week is unknown for 'quality of life' and low for 'physical functioning' (low quality of evidence). The effect of exercise therapy with a frequency of four to five times per week is unknown for 'quality of life' and 'physical functioning'.

From evidence to recommendation

Based on the scope of the estimated effects and the quality of evidence, which favour a frequency of twice per week compared to a frequency of three times, or four to five times per week, the guideline panel believes that a frequency of twice per week of supervised exercise therapy is preferable (for indication 2), supplemented by exercises performed independently.

Based on the ACSM guidelines [20], it should be added that muscle strength or functional exercises and/or activities are recommended to be done daily but at least two days per week and aerobic exercises and/or activities preferably daily, but at least five days per week for at least 30 minutes per time, also in order to comply with the 'Dutch physical activity guidelines'.

Recommendation for the frequency of the exercise therapy

Aim for the following frequency in order to also comply with the 'Dutch physical activity guidelines' (see section A.6):

- *Muscle strength exercises and/or activities* Training of a specific muscle group, preferably daily, but at least two days per week. Maintain a recuperation period of 48 hours after intensive muscle strength training for the trained muscle group. Tailor the build-up to the patient's capacity.
- *Aerobic exercises and/or activities*: Preferably daily, but at least five days per week, lasting at least 30 minutes per session. Tailor the build-up to the patient's capacity.
- *Functional exercises and/or activities*: Preferably daily, but at least two days per week. Also incorporate bone-strengthening exercises. Tailor the build-up to the patient's capacity.

Note 16. Intensity

Clinical question

Which intensity of the exercise therapy is recommended for patients with RA?

Conclusion from the literature study

The effectiveness of high-intensity exercise therapy (with progressive build-up) versus low-intensity exercise therapy on quality of life, physical functioning and fatigue is unknown, because there are few studies available about this and because the estimated effects in the studies that are available are not reported. Furthermore, the quality of evidence of the available studies is low.

From evidence to recommendation

Based on the lack of usable estimated effects and the low quality of evidence in the area of high-intensity exercise therapy versus low-intensity exercise therapy, the guideline panel believes that no decision can be made about a preference for one or the other intensity. Therefore, it was decided to consult the ACSM guidelines. Based on the ACSM guidelines, the guideline panel determined the minimum intensity of muscle strength training and aerobic training.

Recommendation for the intensity of the exercise therapy

Aim for the following minimum intensity:

- *Muscle strength training*: 60–80% of 1 repetition maximum (1RM; Borg score 14–17) for people who are used to strength training. Adjust the intensity to 50–60% of 1RM (~Borg score 12–13) for people who are not used to strength training. Aim for two to four sets of 8–15 repetitions and a 30–60 second break between sets.
- *Aerobic training*: > 60% of the maximum heart rate (~Borg score 14–17) for people who are used to aerobic training. Adjust the intensity to 40–60% of the maximum heart rate (Borg score 12–13) for people who are not used to aerobic training.

Note 17. Type

Clinical question

Which type of exercise therapy is recommended for patients with RA?

Conclusion from the literature study

No RCTs were found where the effectiveness of the various types of exercise therapy are directly compared to one another. The recommendation for the type of exercise therapy is based on the ACSM guideline.[1]

From evidence to recommendation

Not applicable.

Recommendation for the type of exercise therapy

- Offer exercise therapy in a combination of muscle strength training (choose exercises that involve several muscle groups and joints) and aerobic training (choose activities where the patient can train with moder-

ate to high intensity, such as walking, cycling, swimming, rowing and using the cross trainer).

Note Combine functional exercises (for example, using the patient's own body weight) and exercises on machines with muscle strength training and aerobic training.

- During one treatment session, focus at least 75% of the treatment time on one type of training – muscle strength training or aerobic training – for an optimum treatment result. Instruct the patient to perform the type of training that was not covered in as much detail in the treatment session independently.
- Use functional training: integrate activities into the exercise therapy in which the patient is limited (such as walking, climbing stairs, sitting down in and standing up from a chair, lifting or gripping large and small objects) by practicing (parts of) these activities.
- Consider supplementing the exercise therapy with specific balance, coordination and/or neuromuscular training if there are problems in this area.
- Consider supplementing the exercise therapy with active range-of-motion or muscle stretching exercises, if there are any shortened muscles and/or reversible limitations in range of motion of the joint that inhibit the patient's functioning.

Note 18. Duration

Clinical question

Which duration of the exercise therapy is recommended for patients with RA?

Conclusion from the literature study

The literature shows a large effect of exercise therapy with a duration of three to six months on 'quality of life' (low quality of evidence) and 'pain' (reasonable quality of evidence). The effectiveness of exercise therapy with a duration of less than three months and a duration of more than six months on quality of life and pain is unknown. With respect to the 'physical functioning' outcome measure, there is no difference in the effectiveness between the duration of less than three months, three to six months and more than six months of exercise therapy.

Van bewijs naar aanbeveling

Based on the scope of the estimated effects and the quality of evidence, which are in favour of a duration of three to six months compared to a duration of less than three months and a duration of more than six months, the guideline panel believes that a duration of three to six months is preferable (for indication 2). Here the guideline panel adds that the aim is to supplement the treatment period with one or several follow-up sessions toward the end of the treatment period in order to facilitate therapy adherence and to encourage the patient to continue exercising and being active independently during and after the treatment period.

Recommendation for the duration of the exercise therapy

Aim for a treatment period between three and six months. Supplement the treatment with one or more follow-up sessions. The goal of these sessions is to promote therapy compliance, and they can be scheduled the moment that the scope of the supervised exercise therapy is reduced and independent exercising and physical activity predominate. Encourage the patient to continue exercising and moving independently after the treatment period.

Note 19. General factors

Clinical question

Which general factors does the exercise therapy for RA patients have to meet?

This clinical question was answered by describing the general factors which exercise therapy for RA patients must meet, based on the ACSM guideline.[1]

Literature studies were conducted to determine the effectiveness of the exercise therapy in patients with hand problems and the effectiveness of exercise therapy in water.

Exercise therapy for patients with hand problems

Conclusion from the literature study

The literature shows a large effect of hand exercises on the 'physical functioning' outcome measure, with a low quality of evidence. The effect of hand exercises on the outcome measures 'quality of life', 'fatigue' and 'pain' is unknown.

From evidence to recommendation

Based on the effect of hand exercises on physical functioning and the limited undesirable effects (disease activity does not increase as a result of hand exercises) and the high degree of acceptability and feasibility of hand exercises, the guideline panel believes that hand therapy can be considered for patients with hand problems.

Recommendation for hand exercises

For patients with hand problems, consider implementing a specific hand exercise programme. To this end, the patient can be referred to a physical therapist, an exercise therapist or an occupational therapist with specific expertise in the (arthritic) hand.

Exercise therapy on land versus exercise therapy in water*Conclusion from the literature study*

The effectiveness of exercise therapy on land versus exercise therapy in water on the outcome measures 'quality of life', 'physical functioning', 'fatigue' and 'pain' is unknown.

From evidence to recommendation

The literature does not provide a definitive answer about the effectiveness of exercise therapy on land versus exercise therapy in water. The guideline panel believes that exercise therapy in water can be considered for patients with severe pain during the initial phase of the treatment, depending on the patient's preferences in a specific situation.

Recommendation for exercise therapy on land versus exercise therapy in water

Consider offering exercise therapy in water during the initial phase of the treatment if the patient experiences severe pain during the exercises.

Note 20. Modification of exercise therapy due to comorbidity**Clinical question**

Which modifications to the exercise therapy are recommended for patients with RA if they have one or more forms of comorbidity that affect their physical functioning?

This question was answered by describing the modifications to the exercise therapy. (Scientific) literature was consulted for this.

To modify exercise therapy in case of comorbidity that impedes daily functioning, the therapist must possess sufficient knowledge and skills to treat the patient with that comorbidity. If this is not the case, then the therapist should refer the patient to a therapist who does have this knowledge and these skills. To modify the exercise therapy, the therapist must have knowledge of and experience with the i3-S strategy for modifying the exercise therapy in the presence of comorbidity in addition to the index disease.[1] This strategy was previously applied for modifying the exercise therapy in the presence of comorbidity in addition to the index disease osteoarthritis of the knee [2] and breast cancer.[3]

Note 21. Non-exercise therapy interventions**Clinical question**

Are non-exercise therapy interventions, either with or without exercise therapy intervention, recommended for RA patients?

Conclusion from the literature study

The search for literature of sufficient methodological quality did not yield any literature about the effectiveness of massage, thermotherapy, medical taping, passive mobilisations and dry needling. The included literature about low-power laser therapy, electrostimulation (including TENS) and ultrasound contained many estimated effects of unknown scope (because the effect size was not reported). The quality of the available evidence was very low.

From evidence to recommendation

Based on the lack of scientific substantiation for non-exercise therapy interventions in RA patients, the lack of scientific substantiation for non-exercise therapy interventions for other disorders and the general tendency

within the physical therapy field to focus on an active approach, the guideline panel believes that low-power laser therapy, electrostimulation (including TENS), ultrasound, massage, thermotherapy, medical taping and dry needling can be strongly discouraged ('preferably do not offer'). The guideline panel is of the opinion that passive mobilisation should preferably not be offered. Passive mobilisation can be considered, to support exercise therapy, exclusively as a short-term intervention for increasing joint mobility in patients without active inflammation.

Recommendation for non-exercise therapy interventions for RA patients

The following interventions should not be offered to patients with RA:

- low level laser therapy
- electrostimulation (including TENS)
- ultrasound
- massage
- thermotherapy
- medical taping
- dry needling

Passive mobilisation of joints and muscles should preferably not be offered to patients with RA. Consider short-term passive mobilisation of an affected joint to support exercise therapy only to patients without active inflammation in order to increase joint mobility.

Note Passive mobilisations are contraindicated for cervical problems.

Note 22. Behavioural interventions for facilitating physical activity

Clinical question

Are (behavioural) interventions for stimulating the degree of physical activity under the supervision of a physical or exercise therapist recommended for RA patients?

Conclusion from the literature study

The literature shows a large effect of behavioural interventions for facilitating physical activity on the degree of physical activity (from moderate to high intensity) compared to no intervention or standard care, with a high quality of evidence. The literature also shows a large effect of behavioural interventions for facilitating physical activity on the degree of physical activity (of low intensity) compared to no intervention or standard care, with a reasonable quality of evidence. The effect of behavioural interventions for facilitating physical activity on the degree of sedentary behaviour compared to no intervention or standard care is unknown.

From evidence to recommendation

Based on the desired effects of behavioural interventions for stimulating the degree of physical activity, the probability of cost-effectiveness and the high degree of acceptability and feasibility, the guideline panel believes that behavioural interventions for stimulating the degree of physical activity can be strongly recommended for patients who are insufficiently physically active ('offer behavioural interventions for stimulating the degree of physical activity').

Recommendation

Offer patients who are not sufficiently physically active behavioural interventions in order to stimulate the degree of physical activity.

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