

# **KNGF-Guideline**

## **for Physical Therapy in patients with rheumatoid arthritis**

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In the context of international collaboration in guideline development, the Royal Dutch Society for Physical Therapy (Koninklijk Nederlands Genootschap voor Fysiotherapie, KNGF) has decided to translate its Clinical Practice Guidelines into English, to make the guidelines accessible to an international audience. International accessibility of clinical practice guidelines in physical therapy makes it possible for therapists to use such guidelines as a reference when treating their patients. In addition, it stimulates international collaboration in the process of developing and updating guidelines. At a national level, countries could endorse guidelines and adjust them to their local situation if necessary.

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KNGF's objective is to create the right conditions to ensure that high quality physical therapy care is accessible to the whole of the Dutch population, and to promote recognition of the professional expertise of physical therapists. KNGF represents the professional, social, and economic interests of over 20,000 members.

The guideline is summarized on a flowchart; the Practice Guidelines as well as the flowchart can be downloaded from [www.fysionet.nl](http://www.fysionet.nl).

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# Practice Guidelines

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## A Introduction

### A.1 Problem definition

This KNGF Guideline describes the diagnostic and therapeutic process of physical therapy for patients with rheumatoid arthritis (RA). The guideline is intended for the treatment of patients experiencing health problems associated with RA, including the group of patients with RA who have been fitted with a prosthetic joint. This KNGF guideline refers exclusively to RA, and not to other rheumatic diseases like systemic lupus erythematosus (SLE), systemic sclerosis, osteoarthritis, ankylosing spondilitis (AS), psoriatic arthritis or juvenile idiopathic arthritis (JIA; including JIA in adults). In addition to complaints of the musculoskeletal system, people with RA may also have other acute and/or chronic disorders (co-morbidity). Such disorders may be related to their disease, as in the case of extra-articular manifestations (EAM), or to the treatment, or be wholly unconnected to the RA. While relevant co-morbidities are described in this guideline, they are not specifically discussed in the description of the diagnostic and therapeutic process.

### A.2 Target group

This guideline is intended for physical therapists (both general physical therapists and specialists like manual therapists and psychosomatic physical therapists) who treat patients for health problems related to RA in a monodisciplinary or multidisciplinary setting. Effective treatment of patients with RA requires physical therapists to possess specific knowledge and skills (acquired through training, experience or in-service training or refresher courses). This *KNGF Guideline on Rheumatoid Arthritis* intends to provide physical therapists with specific knowledge on the natural

course of RA (including the associated pathophysiological processes), consequences of RA in general, consequences of RA that are modifiable by physical therapy, and information on the diagnostic and therapeutic process, including the most relevant scientific literature. This guideline can also be used by exercise therapists treating persons with RA.

### A.3 What is rheumatoid arthritis?

#### A.3.1 Introduction

RA is a chronic, systemic inflammatory disorder of unknown origin, mainly localized in peripheral joints. The structures around the joints, like tendon sheaths, bursae, and muscle attachments, are also commonly affected. Less frequently, it may be accompanied by abnormalities of the spine (mostly in the upper cervical vertebrae, hardly ever in the thoracic or lumbar vertebrae). Since RA is a systemic disease, various organs, such as the skin, heart, and lungs may also be affected by the disease process. Patients may also have general symptoms like fever, malaise, and weight loss.

#### A.3.2 Epidemiology

RA occurs all over the world, with prevalence rates ranging from 0.3 to 1.5 percent. The incidence (i.e. the number of new cases of RA) in the Netherlands is estimated to be 0.3 to 1.8/1000/year. RA is two to three times as common among women as among men. It can arise at any age, but most commonly starts at ages between 40 and 60 years. In view of current demographic trends, the absolute number of people with RA in the Netherlands is expected to increase by 27.1 percent between 2000 and 2020. Dutch general practitioners annually see about 16,800 patients with new complaints

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of RA and about 147,500 patients with RA-related complaints. Each year, between 25 and 40 percent of patients with RA who are being treated by a specialist are referred to a physical therapist.

#### A.3.3 Pathophysiology

RA is characterized by inflammation of the synovial tissue. The synovium is a membrane lining those parts of the joint not covered by cartilage, and nourishes the avascular structures. Synovial tissue is also found in tendon sheaths and bursae. Whereas under normal circumstances, the synovial tissue consists of one to three layers of cells, with underlying connective or adipose tissue, the synovial tissue in patients with RA becomes much thicker and inflamed. The inflamed synovial tissue may locally invade at the interface between the synovium and the cartilage, and is then called pannus. This invading inflammatory tissue causes local damage to the cartilage and bone, eventually leading to bone erosion. Enzymes produced by the inflamed synovium cause diffuse degradation of the cartilage, resulting in a narrowed intra-articular space. In addition, cartilage production is disturbed, resulting in a thinner cartilage layer.

RA is generally regarded as an immune-mediated disease, of unknown origin. It is assumed to involve an inappropriate immune reaction (by macrophages, lymphocytes [T and B cells, plasma cells], mast cells, natural killer cells, neutrophils, and fibroblastic synoviocytes) to an as yet unknown antigen (possibly an infection), combined with a specific genetic makeup.

#### A.3.4 Risk factors and prognostic factors

Risk factors for the development of RA include certain genetic factors (such as the Human Leukocyte Antigens HLA-DR4 and HLA-DRB1) and the presence of autoantibodies like rheumatoid factors and anti-CCP antibodies.

The main factors predicting a more serious course of the RA are the presence of rheumatoid factors and anti-CCP antibodies in the early stages of the disease, and the severity of the disease at presentation (high disease activity and radiographic abnormalities). It remains unclear whether genetic makeup contributes to this. Another important factor determining the course of RA and its consequences is its medicinal and other treatment.

#### A.3.5 General clinical characteristics

The most obvious characteristics of RA are joint complaints. It usually starts with a chronic, symmetric inflammation of the joints of the hands and feet, involving particularly the metatarsophalangeal (MTP) joints, the wrists, the proximal interphalangeal (PIP), and the metacarpophalangeal (MCP) joints. Less common features at initial presentation are inflammations of other joints, such as elbows, shoulders, knees, hips, and ankles. Atypical initial presentation features of RA include inflammation of one or a few major joints and transient episodes of joint inflammations, sometimes accompanied by fever (palindromic rheumatism). In addition to peripheral joints, the inflammatory process may also involve the joints between the cervical vertebrae and the temporomandibular joint, as well as extra-articular synovial structures like bursae and tendon sheaths. Synovial inflammations cause pain and swelling, resulting in restricted mobility of the joints involved. In addition to the specific joint complaints, the disease is also frequently characterized by more general symptoms, like generalized morning stiffness, fatigue and, more rarely, fever and general malaise. About

90 percent of RA patients with persistent joint inflammations eventually suffer permanent damage, not only to the cartilage and bone, but also to the surrounding tendons and ligaments and the articular capsule. This can lead to deformities and/or instability of the joints.

Disorders of internal organs may appear at the same time as the joint inflammations or at a later stage. Examples include pericarditis (with clinical manifestations like chest pain, coughing, high fever, and fatigue) and pleurisy (clinically characterized by pain in the chest or back, especially during deep breaths, and sometimes by rapid and superficial breathing and fever). Rheumatoid nodules may appear in the skin, but also in organs like the lungs and heart. In some cases, blood vessels may become inflamed (vasculitis), which, depending on their location and extent, may lead to various problems, like kidney dysfunction, neuropathies, and skin ulcers.

#### **General consequences**

##### *Pain, morning stiffness, and fatigue*

The three most common complaints of patients with RA are pain in the joints, morning stiffness, and fatigue. Articular pain is usually related to local inflammatory activity, tissue degradation or a combination of the two. Morning stiffness, which is defined as generalized stiffness occurring in the morning or after a patient has spent a long time sitting in the same position, is a common symptom of patients with RA. At least three quarters of patients with RA report fatigue, and this symptom may actually be more troublesome to them than the pain.

##### *Reduced muscle power, muscle endurance, and aerobic capacity*

Compared to healthy persons, patients with RA have considerably reduced muscle power, muscle endurance, and aerobic capacity, which may be caused by reduced physical activity levels due to pain, stiffness or fatigue, prolonged use of corticosteroids, or RA-related pulmonary and/or cardiovascular problems.

#### **Specific local consequences**

##### *Upper extremities*

RA can manifest in the hands and wrists, as well as in the elbows and shoulders. Pain, swelling, and functional impairments arise from inflammatory activity and/or degradation of the joint and/or periarticular structures (capsules, ligaments, tendon sheaths, and bursae).

Complaints of the wrists and minor hand joints are reported by over 80 percent of RA patients. Weakening of capsules and ligaments due to inflammation can cause characteristic deformations of the fingers, such as luxation or subluxation and ulnar deviation of the MCP joints. Characteristic deformities of the fingers in the sagittal plane include the so-called swan neck deformity, characterized by a combination of hyperextension of the PIP joint and flexion of the DIP joint, and the Boutonnière deformity, characterized by flexion of the PIP joint and extension of the DIP joint. Characteristic deformations of the wrist include supination of the carpus relative to the radius and ulna, and the bayonet deformity, caused by ulnar and volar displacement of the carpus relative to the radius. Z deformities are characterized by ulnar deviations of the fingers and radial rotation of the carpus.

Other complaints of the hands and wrists besides the various joint deformations include inflammations of the tendons and tendon sheaths (tenosynovitis), as inflammatory tissue invades the tendon and damages the tendon tissue. Prolonged tenosynovitis can eventually cause the tendon to rupture. If the tenosynovitis restricts the movement of the flexor tendon (stenosing tenosynovitis), this may result in reduced finger flexion with a risk of secondary contractures. Swelling due to tenosynovitis of one or more tendons in the carpal tunnel may lead to carpal tunnel syndrome (CTS), with compression of the median nerve causing pain, paresthesias (in digits 1, 2, and 3), and loss of strength in the thenar region. Ruptures of the extensor tendons are more common than those of the flexor tendons, especially ruptures of the extensor tendons of digits 5 and 4 and the extensor pollicis longus muscle. Of the flexor tendons, it is particularly that of the flexor pollicis longus muscle which is prone to rupture. Ruptures of other tendons are relatively rare.

About 20 percent of RA patients have elbow involvement, which may take the form of elbow joint arthritis and/or bursitis olecrani. In rare cases, the caput radii may luxate due to laxity of the ligamentum annulare radii. Synovitis of the elbow can lead to compression of the ulnar nerve, which may cause paresthesias and loss of strength in the hand (ulnaropathy).

More than half of patients with RA develop shoulder complaints, which may be caused by inflammation or damage to the glenohumeral joint, bursitis, tendinitis or even rotator cuff rupture.

#### *Lower extremity*

RA can manifest in the feet, ankles, knees, and hips. In the course of their illness, 80 to 90 percent of RA patients come to suffer from painful feet. The MTP joints of the feet may subluxate, causing hammer toes; in addition, there is often lateral deviation of the big toe in the MTP-I joint (hallux valgus), pushing the other toes aside. Subluxation of the MTP joints increases the pressure underneath the forefoot, causing pain. In addition, pressure points may arise in various places due to ill-fitting footwear. Inflammation and deformities of the foot lead to pain and functional impairments, especially abnormal heel-to-toe movement while walking. Such complaints may be exacerbated by pressure and friction due to ill-fitting footwear. Inflammation of the ankle joint can lead to reduced plantar and dorsal flexion (due to the forced 'maximum loose packed position') in the upper talocrural joint and/or joint damage. It is particularly the reduced dorsal flexion which causes functional impairments, such as abnormal heel-to-toe movement while walking. Inflammation of the subtalar joint can also cause abnormal heel-to-toe movement (reduced pronation) and high pressure underneath the forefoot.

Knee complaints include pain, swelling, and reduced range of motion (especially flexion, but also extension), laxity of the collateral ligaments, atrophy of the quadriceps muscle or posterior herniation of the articular capsule (caused by weakening of a small, usually medial part of the capsule; also known as Baker's cyst).

Hip complaints include pain in the groin and buttocks, low back pain while standing or otherwise putting weight on the hip, and pain at the greater trochanter.

#### *Temporomandibular joint*

One joint that is relatively commonly inflamed is the temporomandibular joint. Patients whose temporomandibular joint is

affected often have bilateral pain, tenderness, and swelling in the preauricular region, and restricted movement in the temporomandibular joint. This may result in problems opening the mouth and chewing food.

#### *Cervical vertebrae*

Involvement of the cervical vertebrae, which occurs in 80 to 90 percent of the patients with RA, can lead to instability between the successive vertebrae and/or between the vertebrae and the skull, due to laxity and degradation of the ligaments. The most common instability is that between the first (C1) and second (C2) vertebrae. The instability may be horizontal, vertical or lateral, or take the form of abnormal rotation. It may be asymptomatic but can also lead to pain and neurological symptoms. The pain is often characteristic, radiating forward from the back of the head, across the head and the back of the neck. Neurological symptoms are caused by compression of the spinal cord, nerve roots and/or cranial nerves. Early symptoms include paresthesias and dysesthesias of the hand (unpleasant sensations in the fingers), while more serious symptoms include motor deficits (which may lead to incontinence), jumpy legs, and brain stem deficits (due to the dens migrating into the foramen magnum), which may even lead to sudden death. Persistent inflammation may also cause erosions of the cervical vertebrae, especially in the atlanto-occipital joint (vertical or horizontal instability) and the atlantoaxial joint (horizontal instability).

#### *Extra-articular manifestations*

##### *Rheumatoid nodules*

Rheumatoid nodules are benign nodules of variable size that may arise in many parts of the body. They often develop subcutaneously in places where the bone is close to the surface, for instance on the extensor surfaces of the lower arms, the fingers, around the Achilles tendons, and underneath the feet, but may also occur on the ear or in organs like the heart and lungs. Although benign, their presence in certain locations may cause specific complaints. Nodules underneath the feet may hamper walking, and those on the fingers may affect dexterity. They may be located in places, such as the elbows, where they are likely to be hurt by contact with objects, causing wounds that may become infected. If they cause problems, they can be surgically removed, although recurrences are common. Nodules may occasionally be caused by the use of methotrexate.

##### *Neurological disorders*

Vasculitis is an inflammation of small and medium-sized blood vessels, which can cause skin ulcers and neuropathies. Other neurological disorders associated with RA that may arise from local inflammation or local tissue degradation include compression of the median nerve at the wrist (CTS) or of the ulnar nerve at the elbow (ulnaropathy). As referred to above, compression of the medulla or spinal cord may occur due to cervical instability and dislocation.

#### **A.3.6 Course of the disease**

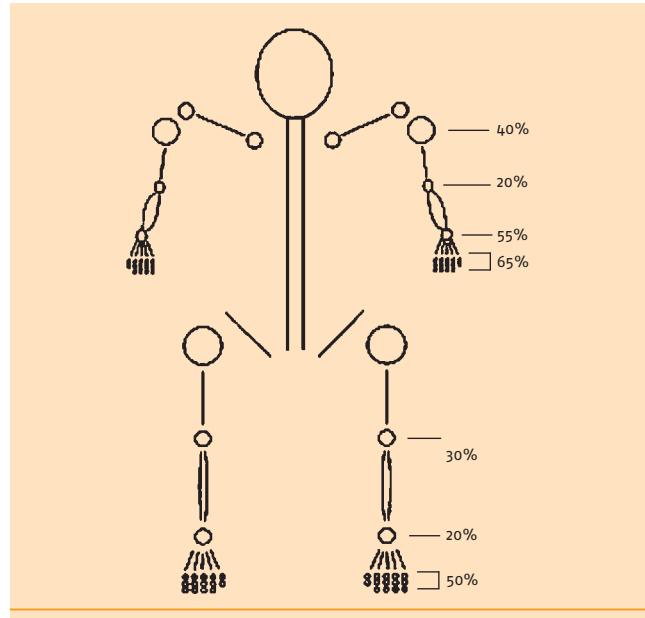
The course of RA can vary greatly between patients. The disease may take a mild course for prolonged periods, but can also involve persistent active inflammation or alternating active and quiescent phases. A prolonged disease course with persistent active inflam-

mation generally leads to severe tissue damage, resulting in serious limitations of activities and restricted participation, while a shorter and milder course leads to fewer activity and participation problems. The disease course can be so severe as to cause total erosion of joints, which can only be treated by means of prostheses. Such a severe course is generally found among patients in whom virtually all therapies fail, or who do not tolerate therapy or refuse treatment. On the other hand, some patients may experience little disease activity (remission), suffer no tissue damage and be able to enjoy almost completely normal body functions. These are usually patients who respond well to therapy. The disease stage is referred to as stable if there is little or no disease activity over a prolonged period.

Some decades ago, the average life expectancy of patients with RA was 5 to 15 years shorter than that of the general population, due to a higher frequency among these patients of cardiovascular diseases, infections, and complications of the disease, sometimes related to the use of medication (see Section A.14 of the Review of the Evidence). The advent of new medications has changed this, although patients with RA are still at increased risk of co-morbidity, such as cardiovascular disorders or osteoporosis, compared to healthy people.

#### **Medical diagnostics**

A diagnosis of RA is established, on the basis of history-taking and clinical examination, supplemented if necessary by laboratory tests and radiographic imaging, if the patient meets at least 4 of the 7 classification criteria of the American College of Rheumatology (ACR), with the first 4 criteria having been met for at least 6 weeks. These criteria were developed to classify RA for research purposes, and are not suitable for the early detection of RA patients in routine practice. When a patient presents with inflammation of a joint but does not (or not yet) meet the above ACR criteria, the doctor will have to decide whether this is a case of incipient RA or a transient arthritis (e.g. viral, reactive, gouty, Lyme or septic arthritis). The diagnosis of RA must always be made by a doctor, based on the clinical features (rather than on the above classification criteria).



*Figure 1. Frequency of joint involvement in RA. Reproduced by kind permission from: Bijlsma JWJ. Reumatologie en klinische immunologie. Houten: Bohn Stafleu van Loghum; 2004.*

#### **Physical examination**

All joints that may be involved in the RA disease process are evaluated in terms of pain, swelling, restricted range of motion, and stability (see Figure 1).

#### **Laboratory examinations**

About 80 to 90 percent of patients with RA show an acute phase response (as evidenced by the presence of acute inflammation proteins), characterized by elevated C-reactive protein, elevated erythrocyte sedimentation rate (ESR), thrombocytosis, and anemia. The absence of such an acute phase response, however, does not exclude a diagnosis of RA. Rheumatoid factors are found in about 80 percent of patients with RA, though they are not specific to this

*Table 1. Classification criteria for RA according to the American College of Rheumatology (ACR). The diagnosis of RA is made if patients meet at least 4 of the 7 criteria, with criteria 1 to 4 having been met for at least 6 weeks.*

Criterion	Definition
1 morning stiffness	stiffness of the joints that does not disappear completely within one hour
2 arthritis in three or more joints	swelling or hydrops identified by a doctor
3 arthritis in the joints of the hand	swelling or hydrops in the wrist, metacarpophalangeal or proximal interphalangeal joints
4 symmetric arthritis	simultaneous inflammation of identical joints on both sides of the body
5 nodules	subcutaneous or periosteal nodules identified by a doctor
6 rheumatoid factors	presence of antibodies against IgG in the serum, as shown by an agglutination test
7 radiographic changes	presence of erosions on radiographs of the hands and wrists

disorder and are also found in 5 percent of healthy peers). Three different types of rheumatoid factor have been identified: IgA, IgG, and IgM, the IgM type being the most common. Antibodies against citrullinated proteins (cyclic citrullinated peptides or CCPs) are nearly exclusively found in RA patients, and can be detected with the anti-CCP test. Laboratory tests of synovial fluid or tissue are mainly used to exclude other disorders, like gouty or septic arthritis. Although the synovial fluid of patients with RA contains large numbers of leukocytes, this is not a specific characteristic of RA, as it is also found in gout and other disorders.

### **Imaging**

In order to evaluate the patient's health status, the physical therapist needs to be aware of any radiographic abnormalities (in many cases, a radiographic, MRI or ultrasound examination will already have been done, and the physical therapist can obtain the results from the referring specialist). Radiographs are used to identify abnormalities of the bones and cartilage. If any radiographic abnormalities have been found, the physical therapist should take these into account in the diagnostic and therapeutic process. Characteristic radiographic abnormalities include periarticular decalcification, loss of cartilage (narrowing of the intra-articular space), and bone erosions. The first abnormalities are frequently seen in the smaller joints of the hands (MCP joints) and feet (MTP joints). The absence of radiographic abnormalities does not exclude a diagnosis of RA, however. Ultrasound and magnetic resonance imaging (MRI) can reveal signs of inflammation in the joints (hydrops and capsular edema) and of the periarticular structures (bursae and tendon sheaths).

### **Standardized rating of disease activity**

A frequently used instrument to assess the level of disease activity in RA patients is the Disease Activity Score (DAS), which assesses the following aspects:

- tenderness ('tender joint count 28 of 44' or Ritchie Index);
- swelling ('swollen joint count 28 of 44');
- ESR or C-reactive protein (CRP) value;
- patient-perceived disease activity (VAS).

These four scores are used to determine the overall DAS score. The lower the DAS score, the lower the disease activity. DAS is increasingly used to guide the medical management.

### **A.3.7 Consequences of rheumatoid arthritis for patients**

Depending on the severity and the number of joints involved, the consequences of RA can impact considerably on the patient-perceived quality of life. Possible health problems resulting from RA can be described on the basis of the 'International Classification of Functioning, Disability and Health' (ICF), developed by the World Health Organization (WHO). This classification distinguishes consequences relating to 'body functions', 'body structure', and 'activities and participation'. In addition, it includes 'environmental factors' and 'personal factors' to assess the consequences of a disease. The ICF was used a few years ago to identify the main disease-related impairments and limitations in these domains (except personal factors) in patients with RA, based on literature studies and reports by patients and care providers. The most frequently reported impairments and limitations were then included in the 'International Classification of Functioning, Disability and

Health (ICF) Core Set for rheumatoid arthritis'. For instance, many RA patients report a 'deteriorated physical condition', which was translated into ICF terms as 'impaired exercise tolerance' (b455). This 'ICF Core Set for rheumatoid arthritis', supplemented by personal factors, was used to select those consequences of RA that are relevant to physical therapists, which are included in this KNGF Guideline (see Figure 2). The list of relevant consequences of RA in this guideline starts with limitations of activities and restrictions of participation, followed by impairments of body functions and body structures, and finally personal and environmental factors. This order was chosen because the guideline assumes that the main goal of physical therapy for patients with RA is to improve and preserve everyday functional status and participation. This implies that the therapist should above all concentrate on limitations of activities and restrictions of participation, although problems of body function and body structure or personal and environmental factors should never be ignored.

In some cases, impairments may be the cause of existing limitations of activities and restrictions of participation, whereas in other cases, such impairments might lead to future limitations and restrictions. In the latter case, the physical therapist should concentrate on these impairments so as to prevent future limitations and restrictions.

### **Activities and participation**

The physical therapist should assess whether the RA patient is experiencing any limitations of everyday activities or restrictions of participation, identify impairments of body functions and/or body structure, and evaluate whether these problems might be linked to the patient's activity limitations and participation restrictions. If the physical therapist finds that the patient's complaints are beyond his or her competence (e.g. complex problems of the hands or feet), or if treatment by one care provider cannot alleviate the problems, the therapist should consult the patient's rheumatologist and consider whether the patient should be referred to a care provider who has the required specific competence, such as a physical therapist specializing in hand problems, or to a special multidisciplinary team (see Section A.14 in the *Review of the Evidence*). If the therapist finds indications of impending complications, he or she should refer the RA patient to their specialist or family doctor.

### **Activities**

Most patients with RA report various degrees of limitation with regard to everyday activities like mobility, self-care and housekeeping (see Figure 2). The main determinant of physical functioning is the level of disease activity, while damage to joints and psychosocial factors also have an impact. Compared to some decades ago, the average severity of limitations of everyday activities perceived by RA patients appears to be decreasing, probably as a result of improved medicinal and surgical treatment options.

### **Participation**

A large majority of RA patients report various degrees of restrictions in terms of interpersonal interactions and relationships, as well as in aspects of social life such as remunerative employment and leisure activities. Two years after developing the disease, 15 to 30 percent of Dutch RA patients have become permanently unemployed. Whether or not an RA patient is able to remain in remunerative

**Rheumatoid arthritis: a chronic, progressive systemic disorder characterized by symmetric inflammations of the joints.**

**Functions**

Mental functions

- Energy and drive (b130)
- Sleep (b134)
- Emotional (b152)
- Experience of self and time (b180)

Sensory functions and pain

- Sensation of pain (b280)

Functions of heart and blood vessels, hematologic system, immune system and respiratory system

- Functions of the hematologic system (b430)
- Exercise tolerance (b455)

Functions of the digestive, metabolic, and endocrine systems

- Ingestion (b510)

Genitourinary and reproductive functions

- Sexual functions (b640)

Neuromusculoskeletal and movement-related functions

- Mobility of joints (b710)
- Stability of joints (b715)
- Muscle power (b730)
- Muscle endurance (b740)
- Sensations related to muscles and movement (b780)
- Gait pattern (b770)

**Participation**

Interpersonal interactions and relationships

- Intimate relationships (d770)

Major life areas

- Work and employment (d850)
- Work and employment, other specified and unspecified (d859)

Community, social and civic life

- Recreation and leisure (d920)

**Environmental factors**

Products and technology

- Products or substances for personal consumption (e110)
- Products and technology for personal use in daily living (e115)
- Products and technology for personal indoor and outdoor mobility and transportation (e120)
- Products and technology for communication (e125)
- Products and technology for employment (e135)
- Design, construction, and building products and technology of buildings for public use (e150)
- Design, construction, and building products and technology of buildings for private use (e155)

Natural environment and human-made changes to environment

- Climate (e225)

Support and relationships

- Immediate family (e310)
- Friends (e320)
- Personal care providers and personal assistants (e340)
- Health professionals (e355)
- Other professionals (e360)

Attitudes

- Individual attitudes of immediate family members (e410)
- Individual attitudes of friends (e420)
- Individual attitudes of acquaintances, peers, colleagues, neighbors and community members (e425)

Services, systems and policies

- Transportation services, systems and policies (e540)
- Social security services, systems and policies (e570)
- Health services, systems and policies (e580)

**Activities**

Learning and applying knowledge

- Writing (d170)

General tasks and demands

- Carrying out daily routine (d230)

Communication

- Using communication devices and techniques (d360)

Mobility

- Changing basic body position (d410)
- Maintaining a body position (d415)
- Lifting and carrying objects (d430)
- Fine hand use (d440)
- Hand and arm use (d445)
- Carrying, moving, and handling objects, other specified and non-specified (d449)
- Walking (d450)
- Moving around (d455)
- Moving around in different locations (d460)
- Moving around using equipment (d465)
- Using transportation (d470)
- Driving (d475)

Self-care

- Washing oneself (d510)
- Caring for body parts (d520)
- Toileting (d530)
- Dressing (d540)
- Eating (d550)
- Drinking (d560)
- Looking after one's health (d570)

**Body structures**

The eye, ear and related structures

- The eye, ear, and related structures, unspecified (s299)

Structures related to movement

- Structure of upper extremity (s730)
- Structure of lower extremity (s750)
- Structure of head and neck region (s710)
- Structure of shoulder region (s720)
- Structure of trunk (s760)
- Additional musculoskeletal structures related to movement (s770)

Skin and related structures

- Structure of areas of skin (s810)

**Personal factors**

- Age
- Sex
- Education
- Experiences
- Personality and character
- Skills
- Co-morbidities
- Lifestyle
- Life habits
- Upbringing
- Self-efficacy
- Socio-economic status
- Profession
- Past and present experiences

Figure 2. ICF core set for rheumatoid arthritis.

employment is determined by socio-demographic factors (such as age and education), disease characteristics (such as pain, disease activity, and damage to joints), and the nature of the work (physical demands, autonomy, and opportunities for adaptation).

#### ***Body functions and body structure***

The most common functional and structural disorders are listed in Figure 2. The most relevant aspects for physical therapists are the general consequences and specific local consequences (see Section A.3.5).

#### ***Environmental factors***

##### ***Home adaptations, assistive devices, and services***

Patients with RA frequently make use of home adaptations, assistive devices, and services, their use increasing with the severity and duration of the illness. The possession and use of particular adaptive and assistive devices and services are determined by the perceived level of pain and limitations to specific activities. Examples of commonly used assistive devices, home adaptations and services include electric can openers, raised toilet seats, specially adapted faucets and bath brushes, and financial compensation for special transportation facilities.

The physical therapist should check what home adaptations, assistive devices, and services the patient owns and uses. If a patient needs further adaptations, devices, or services, they should be referred to their specialist or family doctor, with a recommendation for assessment by an occupational therapist or a specialized rheumatology nurse.

##### ***Residential or working environment***

Apart from the patient's own physical abilities, their everyday functional status is greatly influenced by factors such as the presence of stairs and doorsteps, the availability of parking facilities in the residential or working environment and the accessibility of public transport, shops, health centers, hospitals, and other care providers.

The physical therapist should check whether there are any factors in the patient's everyday residential and working environment that might hamper their daily life activities and participation. If specific physical aspects of the patient's residential environment limit their activities, the physical therapist may need to assess the situation *in situ* (i.e. at the patient's home) and administer treatment there. If the patient needs home adaptations, assistive devices or services in their residential environment, the therapist should refer them to their specialist or family doctor, with a recommendation for assessment by an occupational therapist or a specialized rheumatology nurse. If there are restrictive factors in the workplace, the physical therapist can advise the patient to contact the company doctor, who can refer them to a physical therapist specializing in occupational issues.

The patient's social environment is another important factor, as their functional status is also determined by the degree to which they are supported by those around them, such as their partner, relatives, friends, and colleagues.

##### ***Use of care facilities***

Patients with RA frequently rely on multidisciplinary care. The management of patients with multiple or complex problems may

involve not only rheumatologists and physical therapists but also care providers from other disciplines, like general practitioners, exercise therapists, occupational therapists, social workers, rheumatology nurses, rehabilitation physicians, orthopedic or plastic surgeons, orthopedic shoemakers, podiatrists, and psychologists. Over a one-year period, almost half of all RA patients consult two or more other care providers apart from their rheumatologist, and 20 percent are hospitalized. In addition to professional care providers, informal caregivers, especially the patients' partner, fulfill an important role.

If a patient is being treated by multiple care providers, the physical therapist should maintain regular contact with the other providers, in order to coordinate the various treatments. These consultations, preferably by phone or e-mail, should take place at least before the start of treatment and at its termination, but also in between if necessary.

If a patient's problems require the simultaneous involvement of multiple care providers and cannot be satisfactorily addressed by individual providers, treatment by a multidisciplinary team may be considered. Referral to such a team is the task of the specialist who is treating the patient.

#### ***Personal factors***

##### ***Psychological factors***

On the one hand, psychological factors affect the limitations RA patients perceive in their daily life activities and participation in society. Conversely, physical impairments and dependence may have an unfavorable effect on the patient's psychological functioning. As regards mood issues, depression (both clinical depression and depressed mood) is more common among RA patients than among healthy persons. Various studies have also shown that coping is a major determinant of patient well-being. Coping is defined as any conscious application of cognitions or behavior intended to deal with the consequences of the disorders. The use of passive and/or avoidance strategies is negatively correlated with the level of pain and the patient's well-being, whereas an active coping strategy has a positive impact on the level of pain perceived and the activity limitations.

#### **A.4 The role of physical therapists in the treatment of patients with RA**

Physical therapists assist patients in the process of improving and/or coping with the limitations and restrictions they experience in activities of daily living, by using adaptive and compensatory treatment strategies. Although physical therapists cannot influence the actual disease process or its genetic and predictive factors (e.g. the presence of rheumatoid factors and anti-CCP antibodies), they are able to modify the consequences of the disease, such as reduced exercise tolerance or muscle power. This means that physical therapists can play an important part in the disease course. To this end, it is important for the therapists to recognize patterns in the development of activity limitations and participation restrictions, and to relate these limitations and restrictions to functional and structural impairments.

Physical therapists can apply the following therapeutic options: information and education (whether or not in groups); supervised exercise (whether or not in groups), including exercises in water; the use of physical modalities, passive hydrotherapy or

balneotherapy, manual techniques, and combinations of various therapeutic methods (combination therapy). (For a more detailed description of these methods, see Chapter C.)

Patients with RA should preferably be treated with active methods, with the physical therapist acting mostly in a coaching capacity. In individual cases, however, passive modalities like manual therapy might be included in the treatment.

In addition to improving patients' health and teaching them coping strategies, physical therapists also play an important part in helping patients adopt healthier movement patterns, by offering them advice on exercise and mobility. Such advice can also be given to RA patients who are not yet experiencing limitations in their daily life activities.

## B Diagnostic process

This KNGF Guideline only applies to patients who have been diagnosed with RA by a rheumatologist.

The diagnostic process includes presentation, referral, history-taking, examination, analysis of the information obtained from history and examination, and designing a treatment plan.

### B.1 Presentation

If a patient with a diagnosis of RA presents without having been referred for physical therapy, the therapist is urgently recommended to contact the patient's rheumatologist before starting treatment, to obtain further details. The rheumatologist can supply essential information that may be relevant to the therapist, such as the degree of damage to the joints, the current and expected disease activity status under the present medical management, and any co-morbidity. (History-taking and examination may already be started before the information is received.)

### B.2 Referral

If a patient has been referred for physical therapy, the referral form should include the following details:

- name of patient (and possibly their address and health insurance details);
- date of referral;
- diagnosis (possibly a diagnostic code);
- referral indication;
- relevant details of the patient's health status (including current and expected disease activity status under the present medical management, radiographic damage to the joints, and co-morbidity);
- name of referring doctor;
- signature of referring doctor;
- name of patient's family doctor (if the patient has been referred by someone else).

**NOTE:** If a patient has been referred by his/her family doctor, the physical therapist should check whether the diagnosis of RA was established by a rheumatologist.

### B.3 History-taking

The physical therapist should ask for the information he or she needs to identify the patient's health problems (which will eventually result in a definition of the patient's care requirement). The

physical therapist assesses the present health status by systematically asking about activity limitations and participation restrictions, functional and or structural impairments, and other personal and environmental factors. As was explained above, the primary focus when treating patients with RA is on activity limitations and participation restrictions. This means that history-taking should preferably start with questions on such limitations and restrictions, followed by questions about functional and structural impairments, personal and environmental factors and other relevant issues that must be addressed.

Relevant issues for history-taking include:

#### *Activities and participation*

- mobility (e.g. walking, maintaining and changing body position);
- self-care (e.g. washing oneself, dressing and undressing, eating and drinking) and caring for others (e.g. children);
- general tasks and demands (e.g. activities of daily living such as housekeeping);
- remunerated employment, housekeeping, and leisure activities.

#### *Functional and structural characteristics*

- pain, stiffness, fatigue;
- mobility, swelling, redness, and stability of joints;
- muscle power, muscle coordination, muscle endurance and exercise tolerance.

#### *Personal and environmental factors*

- age, sex, education, living conditions, lifestyle;
- psychological functioning, coping, anxiety, depression.

#### Other factors

- presence of general and RA-specific red flags (see Section B.4);
- presence of specific concerns (see Section B.4);
- use of medication;
- patient's need for information;
- patient's views on their own health;
- expectations about physical therapy treatment;
- estimating compliance.

### B.4 'Red flags'

An important aspect of the screening process is checking for pathology that requires medical attention. In this respect, the physical therapist should pay attention to 'red flags' that raise a sense of alarm. The conclusion whether the symptoms are alarming or not is drawn from the perspective of the individual physical therapist. If the therapist decides that the symptoms are alarming and require medical attention, he or she should inform the patient about this and advise them to contact their family doctor or another health professional. For further details, see the *KNGF guideline on reporting*.

#### *RA-specific red flags*

- redness of a joint, whether or not accompanied by fever (may indicate an infectious inflammation of the joint, bacterial arthritis);

- symptoms relating to the central nervous system:
  - neck pain, in combination with paresthesias and/or dysesthesias, motor deficits, jumpy legs, and/or a grainy sensation in the hands (signs of spinal cord compression due to instability of the cervical vertebrae with luxation or subluxation of the first or second cervical vertebra);
  - incontinence and tremors (possible side effects of 'biologicals').
- peripheral neurological symptoms:
  - sensory deficits, whether or not in combination with motor deficits, in the upper extremities (complaints in the area innervated by the median nerve: possible nerve compression);
  - motor deficits (paresis or paralysis), sensory or circulatory deficits in the lower extremities, whether in the form of polyneuropathy (diffuse damage to the nerves in the extremities), or mononeuritis (damage to one specific nerve) (may indicate vasculitis);
- acute exacerbation or increased complaints;
- unexplained persistent severe pain and inflammatory signs in one or more joints;
- recent tendon rupture (e.g. of the extensor digitorum, extensor pollicis, or biceps brachii muscle).

#### **Points of attention**

- severity of damage to cartilage, bone, periarticular tendons, and articular capsule;
- severity of deformities and joint instability;
- presence of rheumatoid nodules;
- high disease activity and radiographic abnormalities in early stage of disease;
- presence of prosthetic joint(s);
- presence of complications and co-morbidity (e.g. cardiovascular disorders or osteoporosis).

#### **B.5 Physical examination**

Since activity limitations and participation restrictions as well as

impairments of body functions and structure can fluctuate considerably during the course of the illness, it is important to examine the patient for the presence or absence of signs of disease activity. To this end, joints must be evaluated in terms of swelling, tenderness, pain upon movement, reduced range of motion, deformities, and instability. The physical examination can be supplemented with an evaluation of neurological symptoms such as sensory deficits and reduced muscle power.

#### **B.6 Measurement instruments**

Various measurement instruments can help the physiotherapist identify and objectively assess the patient's health problem, while some instruments can be used at a later stage to evaluate the results of treatment (see table 2). For a more detailed description of measurement instruments, please consult Supplements 2.1-2.9.

Evaluation of the therapeutic goals requires the use of at least one of the general measurement instruments. Specific evaluations can be done with the help of an instrument developed specifically for the relevant joint or extremity (such as the Shoulder Function Assessment [SFA] for shoulder complaints). Measurements are preferably made at the start of treatment as well as during treatment and at its termination, in order to evaluate the progress made in terms of therapeutic goals.

#### **B.7 Analysis**

Limitations and problems must be evaluated for each individual patient. The analysis is based on the results of history-taking and physical examination, and includes:

(A) Factors that can be improved by means of physical therapy (directly or indirectly):

- limitations of activities and restrictions of participation, such as:
  - mobility (e.g. walking, maintaining and changing body position, etc.);
  - self-care (e.g. washing oneself, dressing and undressing, eating and drinking, etc.);

*Table 2. Measurement instruments for health problem definition.*

General	Measurement instrument
activities and participation	HAQ OR PSC
pain and morning stiffness	VAS-PAIN AND VAS-MORNING STIFFNESS
muscle power, aerobic capacity, joint mobility	and-held dynamometer, 6-minute walk or Ästrand cycle test (including Borg), EPM-ROM
<b>Specific</b>	
Upper extremities	EFA, SFA, DIMENSIONS OF HAQ
Lower extremities	a standardized test (e.g. 50-m walk, Timed Chair Stand test, Timed Up-and-Go test)

*HAQ: Health Assessment Questionnaire; PSC: Patient-Specific Complaint; VAS: visual analog scale; EPM-ROM: Escola Paulista de Medicina Range of Motion; EFA: Elbow Function Assessment; SFA: Shoulder Function Assessment.*

- general tasks and demands (e.g. activities of daily living like housekeeping);
- remunerated employment, housekeeping, and leisure activities;
- impairments of body functions and structure, such as:
  - general consequences:
  - pain and morning stiffness;
  - muscle power, muscle endurance, and aerobic capacity;
  - joint mobility.

(B) Factors that cannot be modified by means of physical therapy (barriers) but are relevant in establishing what the patient can tolerate and his/her prognosis:

- presence of rheumatoid factors and/or anti-CCP antibodies;
- radiographic damage;
- disease activity;
- co-morbidity.

(C) Factors influencing treatment, such as:

- facilitators like
  - positive response to medication;
  - active coping style and social support;
- barriers like
  - passive coping style and lack of social support.

The information thus gained enables the physical therapist to predict the further course of treatment.

Based on the patient's care requirement and the above details, the physical therapist should now answer the following questions:

- What are the goals that the patient wants to achieve, are these goals feasible and is physical therapy intervention the right option to achieve them?
- Does the *KNGF Guideline on Rheumatoid Arthritis* apply to this particular patient?

Physical therapy is indicated if the patient:

- expresses a need for assistance regarding mobility functions which the physical therapist is competent to provide, and
- experiences limitations in one or more activities (general tasks and demands, mobility or self-care), or
- is impaired in terms of:
  - one or more functions of the musculoskeletal system, or
  - a movement-related function, or
  - exercise tolerance, or
- is impaired in terms of one or more movement-related body structures.

Physical therapy is contraindicated if:

- there is evidence of adverse medical factors, whether or not related to RA, which might be aggravated by physical therapy interventions (e.g. instability of the cervical vertebrae);
- personal and environmental factors hamper the treatment to such an extent that therapeutic goals cannot be achieved;
- there are one or more 'red flags' (see Section B.4), whether RA-specific or more general red flags; however, if there is only one red flag, which has existed for a prolonged period of time and of which the patient and their doctor are aware, this need not be a reason for referring the patient back to the doctor, though it is a reason to adjust the physical therapy intervention.

If physical therapy is indicated and the guideline applies, the physical therapist, in consultation with the patient, designs a treatment plan with individual therapeutic goals.

### B.8 Treatment plan

After taking the patient's history and examining him or her, the physical therapist, in consultation with the patient, designs a treatment plan, which includes the prioritized physical therapy goals. The overall objective of treatment, which is central to the treatment plan, has to tie in with the patient's expressed care requirement. In defining the goals, the physical therapist should take account of the patient's motivation, the presence of facilitators and barriers (see Section B.7), and the expected recovery process (based on the outcome of the measurement instruments). The overall objective and therapeutic goals should preferably be defined according to the SMART principles. SMART stands for specific, measurable, acceptable, realistic and timely. A SMART therapeutic goal informs the treatment by indicating what the patient hopes to achieve, and guides both patient and therapist, while also indicating what results should be achieved within what period of time.

An example of a general objective of treatment is:

- Being able to walk to the supermarket and back (approx. 200 m) twice a week, within 10 weeks.

An example of a therapeutic goal is:

- Increasing the maximum walking distance from 50 m to 200 m (without assistive devices), within 6 weeks.

If the patient is concurrently being treated by another discipline, the treatment plans should preferably be coordinated.

After defining the therapeutic goals, the physical therapist chooses the right interventions / techniques to achieve these goals.

## C Therapeutic process

### C.1 General treatment characteristics

#### C.1.1 Location of treatment

The treatment can take place at a primary care practice, at the patient's home or at a rheumatology clinic, rehabilitation centre, nursing home or hospital. The choice of location for the treatment is partly based on accessibility and partly on the available facilities (such as a high-seat chair in the waiting room and a long shoehorn).

#### C.1.2 Frequency and duration of treatment

Physical therapy for patients with RA is classified for insurance purposes as treatment for chronic disorders, which basically means that therapy can be provided for as long as it is medically necessary, provided that the diagnosis of RA has been established by a rheumatologist. Duration and frequency of the treatment may vary, depending on the level of activities limitations and participation restrictions experienced by the patient, as well as on the level of impairment of body functions and structures.

Based on the (SMART) therapeutic goals that have been established, the physical therapist, in consultation with the patient, should determine the expected number of sessions, the frequency of treatment, the location where the treatment is to take place,

and the amount of supervision the therapist will need to provide. The actual number of sessions required to achieve the therapeutic goals depends on the patient's level of motivation, the presence of facilitators or barriers and the patient's coping style. Treatment should be concluded as soon as the therapeutic goals have been achieved, as there is no evidence for benefits of permanent treatment of patients with RA. The therapist should, however, explain to the patient how they can maintain the goals achieved or even progress beyond them.

## C.2 Therapeutic methods

### C.2.1 Supervised exercise

#### *The place of exercise therapy in the physical activity options for RA patients*

The goal of exercise therapy for RA patients is to improve their everyday functional status and social participation by increasing their muscle power and aerobic performance, as well as the range of motion (ROM), joint stability and/or coordination. The exercise therapy described in this guideline refers to a specific, time-limited exercise program, aimed at specific individual health goals, supervised by a physical therapist and started after referral by the patient's doctor. This is what distinguishes this form of exercise therapy from other forms of physical activity that patients may engage in, whether individually or in groups, without aiming for specific individual therapeutic goals. An example of a Dutch physical activity program designed specifically for people with rheumatic disorders is 'Sportief bewegen' (sports exercise) ([www.sportiefbewegen.nl](http://www.sportiefbewegen.nl)), while the program entitled 'Meer bewegen voor ouderen' (more exercise for the elderly) ([www.mbvo-amsterdam.nl](http://www.mbvo-amsterdam.nl)) is an example of an exercise program not specifically intended for people with rheumatic disorders.

#### *Forms of exercise in an exercise therapy program for RA patients*

Possible forms of exercise include:

##### *High-intensity exercise therapy to increase aerobic performance*

This requires a minimum duration of 20 minutes per session and a minimum frequency of 3 times a week, at an intensity of 65 to 90 percent of maximum heart rate (corresponding to > 6 metabolic equivalents [METs]; see Table 3).

##### *Medium-intensity exercise therapy to increase aerobic performance*

This requires a minimum duration of 30 minutes per session and a minimum frequency of 5 times a week, at an intensity of 55 to 64 percent of maximum heart rate (corresponding to 3–6 METs; see Table 3).

##### *Medium-intensity exercise therapy to increase muscle power*

This requires at least 8 to 10 exercises (for all major muscle groups), each repeated 8 to 12 times, at a minimum initial intensity of 30 to 50 percent of the 1-repetition maximum (1RM), on 2 non-consecutive days a week.

##### *Exercise therapy to increase the range of motion (ROM) of the joints*

ROM exercises are intended to increase joint mobility without putting weight on the relevant joint. The exercises need to be carried out on at least 2 to 3 days a week, with at least 3 repetitions per joint.

##### *Exercise therapy for stability and coordination*

Joint stability and coordination can be improved by means of exercises to stimulate the sensorimotor system (such as standing on a balance board). The emphasis in these exercises is on movement control, balance, and fine coordination.

Patients with RA (including those with high disease activity) require a high-intensity exercise program to increase aerobic capacity and muscle power and/or muscle endurance. This program can be supplemented by ROM exercises to maintain joint mobility. Depending on individual therapeutic goals, exercises to improve stability or coordination can also be added to the program.

In individual cases, therapy may be started at medium intensity, after which the intensity is gradually raised. This is especially recommended for patients:

- who have prosthetic joints or whose joints show considerable radiographic damage;
- whose severe physical impairments preclude high-intensity exercises;
- who are afraid to move.

The exercise program can be administered in groups and/or may include exercising in water, depending on the available facilities and the patient's preferences.

*Recommendations to achieve or maintain a sufficient level of physical activity, based on the Dutch general standards for healthy exercise.*

*Table 3. MET scores for various types of physical activity. (Bron: Ainsworth et al. Med Sci Sports Exerc. 2000;32 (suppl.):S498-504.)*

MET's	Physical activities
MET's > 6	walking (at least 4.5 km/h), jogging, and running, basketball (competitive), cycling (at least 14–16 km/h), skiing, soccer, swimming (fast), tennis (singles), and volleyball (competitive)
MET's 3–6	walking (3.0–4.0 km/h), basketball (recreational), cycling (10–12 km/h), swimming (recreational), badminton (recreational), dancing, golf, table tennis, tennis (doubles), and volleyball (recreational)
MET's < 3	walking (2.0 km/h), billiards, darts, and fishing

### C.2.2 Information and advice

The physical therapist should also advise the patient on ways to maintain or increase their level of physical activity in everyday life. The recommendations should be based on the Dutch standard for healthy physical activity (Nederlandse Norm Gezond Bewegen; NNGB), which recommends 30 minutes of medium-intensity physical activity (METs < 3) on at least 5 days a week. The NNGB corresponds to the standards proposed by the American College of Sports Medicine (ACSM) and the American Heart Association (AHA). Most patients will need to change their behavior to meet this physical activity target. The therapist's attempts to stimulate this change can be based on the following principles, derived from various models of behavior change:

1. The physical therapist should be aware that behavior change is not an event but a process, which involves at least three stages: the motivational stage, the initial change stage, and the stage in which the intended behavior is maintained. It is important for the therapist to assess what stage the patient is in. The main aim during the first stage is to check the patient's knowledge and motivation and improve them if necessary. Patients in the second stage need structure and supervision. Patients in the third stage should be able to maintain their new physical activity level, supported by their social environment.
2. The physical therapist should formulate feasible targets and design a step-by-step program, in consultation with the patient. Targets should not differ too much from the patient's current physical activity behavior, should allow gradual extension and should be easily achievable for the patient. The physical therapist should also ensure that the patient has realistic expectations about the treatment.
3. The physical therapist should provide clear instructions, so that the patient knows and understands exactly what they should or can do. A handbook or exercise plan with comprehensive descriptions of exercises may be helpful.
4. The physical therapist should include sufficient variety in the exercise sessions, as lack of variety may cause the patient to become bored, hampering their perseverance. Adherence can also be promoted by introducing game-type or competitive elements into the exercise sessions.
5. The physical therapist should endeavor to make the patient independent of further physical therapy. The therapist should emphasize that the patient will only be able to maintain a suitable level of physical activity if they are intrinsically motivated to do so.
6. Many patients lapse into their old low-activity behavior, which is however not a form of failure but an opportunity to learn. The physical therapist should prepare the patient for this and offer assistance to overcome any relapses.
7. The physical therapist should keep the patient informed about their progress, while ensuring that they are able to assess for themselves whether their physical activity behavior is in agreement with the target (especially in the maintenance stage).
8. People can motivate each other; long-term support from others is very important for behavior change. The therapist should therefore involve the patient's partner or other relatives or friends in the process. Patients can also support each other (for instance through a buddy system or in group therapy).

9. Self-confidence is an important predictor of maintenance of physical activity behavior, and the therapist should encourage the patient, for instance by using role models (other patients) to gradually increase the patient's competence and self-confidence.
10. The physical therapist should remain in contact with the patient to check whether the treatment has been effective. Therapist and patient should evaluate what went well and what aspects did not go according to plan, as the therapist can use this in future treatment for the same or other patients.

### C.2.3 Other interventions

Although patients with RA usually require active therapeutic methods, passive interventions may be considered for a limited period in specific cases, in order to prepare for active interventions like exercise therapy.

The guideline development team neither recommends nor discourages the following interventions:

- delivering electric energy by means of interventions and devices such as interferential therapy or TENS;
- delivering mechanical energy by means of ultrasound devices (1 or 3 MHz);
- delivering or extracting thermal energy by means of thermotherapy (heat and cold);
- massage and manual therapy to improve functional status, reduce pain or reduce disease activity.

The development team discourages the use of electromagnetic energy delivered by means of ultra short-wave (434 MHz and 2450 MHz) or short-wave (27 MHz) devices and the use of passive hydrotherapy or balneotherapy (as a monotherapy) to improve functional status and reduce pain and/or disease activity.

The development team discourages the use of ultra short-wave, short-wave and thermotherapy devices, for whatever purpose, for patients with high disease activity. The team also discourages the use of manual cervical mobilization, in view of possible cervical instability.

## C.3 Evaluation

### C.3.1 Aftercare

The physical therapist should advise the patient about ways to maintain the targets they have achieved. Such advice may include tips for maintaining healthy physical activity behavior in everyday life, or may involve helping the patient take up regular exercise or sports activities or enroll in supervised group exercise programs like the Dutch 'Sportief Wandelen' (walking for exercise), 'Bewegen is Plezier' (exercise is fun), or 'Meer Bewegen voor Ouderen' (more exercise for the elderly).

### C.3.2 Concluding the treatment and reporting

The therapy should be concluded when the therapeutic goals have been achieved, or when the therapist is of the opinion that further physical therapy no longer offers any added value. Treatment should also be terminated when the therapist estimates that the patient is able to achieve the goals independently (i.e. without their assistance). The therapist should report to the doctor who has referred the patient, at least at the conclusion of treatment,

but preferably also during the treatment period, informing them of the individual therapeutic goals established for their patient, the course of the therapeutic process and the results obtained. If the patient was not referred by their family doctor, the latter should also get a copy of the report.

Reporting should conform to the new *KNGF guideline on Reporting on Physical Therapy*. In accordance with this guideline, the final report should preferably not only include the minimally required details, but also indicate:

- whether treatment was in accordance with the KNGF guidelines, any deviations from the guidelines and reasons for doing so; and
- whether anything was agreed about follow-up treatment.

## D Acknowledgements

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# Supplements

## Supplement 1 Recommendations for everyday practice

### Explanation of evidence levels

The levels of evidence for the literature-based conclusions have been defined in national agreements (EBRO/CBO). These distinguish four levels, depending on the quality of the studies on which they are based:

- Level 1: a study of A1 quality, or at least two independent studies of A2 quality
- Level 2: one study of A2 quality or at least two independent studies of B quality
- Level 3: one study of B or C quality
- Level 4: expert opinion

### Quality categories (for intervention and prevention)

- A1 Systematic review including at least two independent studies of A2 quality
- A2 Randomized double-blind comparative clinical trial of sound quality and sufficient size
- B Comparative studies not meeting all the quality criteria mentioned under A2 (including case-control studies and cohort studies)
- C Non-comparative studies
- D Opinions of experts, e.g. the members of the guideline development team

If a systematic review covered RCTs of moderate quality, it was assigned to quality category B instead of A1. Depending on the number of studies of moderate quality (category B), the conclusion was assigned an evidence level of 2 ( $\geq 2$  RCTs of moderate quality) or 3 (1 RCT of moderate quality).

If a comparative study did not meet any of the criteria for A2 research, it was assigned to quality category C.

### Summary of recommendations

#### Diagnostic process

##### 1 Diagnosis of RA (level 4)

The diagnosis of RA must always be established by a doctor, based on the clinical features (not on the classification criteria mentioned under A3.6).

Quality level of articles: D (Bijlsma, 2004<sup>1</sup>).

##### 2 Assessment of patient's health status (level 4)

The physical therapist should assess the patient's health status, based on the presence of radiographic abnormalities (an X-ray, MRI scan, and/or ultrasound examination will often have been carried out, and the physical therapist can contact the referring specialist to obtain these data). If the patient has any radiographic abnormalities, the therapist will need to take these into account during the diagnostic and therapeutic processes.

Quality of articles: D.

##### 3 Consequences of RA for the patient (level 4)

The physical therapist should assess the patient's health status primarily in terms of activity limitations and participation restrictions. In addition, the therapist may also assess impairments of body function and structure, as well as personal and environmental factors, insofar as these relate to the limitations and restrictions.

Quality of articles: D.

##### 4 Activities and participation, body function, and structure (level 4)

The physical therapist should identify any limitations of activities of daily living and restrictions of social participation, as well as any impairments of body function and structure, and their possible interrelations.

If the patient's complaints are beyond the therapist's range of competence (for instance involving complex complaints of the hands and feet) or if treatment by one care provider cannot alleviate the problems, the therapist should consult the patient's rheumatologist and consider whether the patient should be referred to a care provider who has the required specific competence, such as a physical therapist specializing in hand problems, or to a special multidisciplinary team. If the therapist finds indications of impending complications, he or she should refer the RA patient to their rheumatologist.

Quality of articles: D.

**5 Home adaptations, assistive devices, and services (level 4)**

The physical therapist should check what home adaptations, assistive devices, and services each RA patient owns and is using. If the patient needs further adaptations, devices, or services, they should be referred to their specialist or family doctor, with a recommendation for assessment by an occupational therapist or a specialized rheumatology nurse.

Quality of articles: D.

**6 Residential and working environment (level 4)**

The physical therapist should check whether there are any factors in the patient's residential and working environment that might hamper their daily life activities and participation. If specific physical aspects of the patient's residential environment limit their activities, the physical therapist may need to assess the situation *in situ* (i.e. at the patient's home) and administer treatment there.

If the patient needs home adaptations, assistive devices or services in their residential environment, the therapist should refer them to their specialist or family doctor, with a recommendation for assessment by an occupational therapist or a specialized rheumatology nurse.

If there are restrictive factors in the workplace, the physical therapist can advise the patient to contact the company doctor  
Quality of articles: D.

**7 Multidisciplinary care (level 4)**

If a patient is being treated by multiple care providers, the physical therapist should preferably maintain regular contact with the other providers, in order to coordinate the various treatments. This should preferably take the form of consultations by phone or (secure) e-mail, and should take place at least before the start of treatment and at its termination, but also in between if necessary.

Quality of articles: D.

**8 Care for patients with RA (level 4)**

If a patient's problems require the simultaneous involvement of multiple care providers and cannot be satisfactorily addressed by individual providers, treatment by a multidisciplinary team may be considered. Referral to such a team is the task of the specialist who is treating the patient.

Quality of articles: D.

**9 Presentation (level 4)**

At presentation, it is important to ascertain whether the diagnosis of RA has been established by a rheumatologist.

If the diagnosis of RA was not established by a rheumatologist, the present guidelines do not apply.

If the diagnosis of RA was established by a rheumatologist, the physical therapist should contact the rheumatologist to ask for details about joint damage and the current and expected level of disease activity under the present medical management.

Quality of articles: D.

**10 Referral (level 4)**

Note: if a patient has been referred by a general practitioner, the therapist should always check whether the diagnosis was established by a rheumatologist.

Quality of articles: D.

**11 History-taking (level 4)**

The physical therapist should assess each of the following topics, activities and participation, body function and structure, personal and environmental factors, other relevant factors and co-morbidity.

Quality of articles: D.

**12 Red flags (level 4)**

The physical therapist should assess each patient for the presence of any red flags or specific concerns.

Quality of articles: D.

**13 Measurement instruments (level 1)**

The following measurement instruments are recommended for use with RA patients:

Quality of articles: A1 (Arthritis Care and Research, 2003<sup>1</sup>; Swinkels, 2005<sup>2</sup>; Beurskens, 1996<sup>3</sup>; Macsween, 2001<sup>4</sup>; Borg, 1970<sup>5</sup>; Chen et al., 2002<sup>6</sup>; Vliet Vlieland et al., 1993<sup>7</sup>; De Boer et al., 1999<sup>8</sup> and Vermeulen et al., 2006<sup>9</sup>).

**Table 2. Measurement instruments for health problem definition**

General	Measurement instrument
activities and participation	HAQ OR PSC
pain and morning stiffness	VAS-PAIN AND VAS-MORNING STIFFNESS
muscle power, aerobic capacity, joint mobility	Hand-held dynamometer, 6-minute walk or Åstrand cycle test (including Borg), EPM-ROM
<b>Specific</b>	
upper extremities	EFA, SFA, DIMENSIONS OF HAQ
lower extremities	a standardized test (e.g. 50-m walk, Timed Chair Stand test, Timed Up-and-Go test)

*HAQ: Health Assessment Questionnaire; PSC: Patient-Specific Complaint; VAS: visual analog scale; EPM-ROM: Escola Paulista de Medicina Range of Motion; EFA: Elbow Function Assessment; SFA: Shoulder Function Assessment.*

#### **14 Measurement instruments (level 4)**

One general measurement instrument should always be used to evaluate the therapeutic goals.

Specific evaluations can be done with the help of instruments developed specifically for the relevant joint or extremity (such as the Shoulder Function Assessment [SFA] for shoulder complaints).

Measurements should preferably be made at the start of treatment and repeated during treatment and at its termination.

Quality of articles: D.

#### **15 Analysis (level 4)**

The physical therapist should analyze for each patient which aspects can be improved by physical therapy, and to what extent, and whether there are any facilitators or barriers present that may impact on the treatment.

Quality of articles: D.

#### **16 Indication for physical therapy (level 4)**

The physical therapist should assess each patient to see whether physical therapy is indicated and whether the present guidelines apply to this particular patient.

Quality of articles: D.

#### **17 Treatment plan (level 4)**

The physical therapist should define the overall objective and the therapeutic goals while keeping in mind the patient's motivation and the presence of facilitators or barriers.

The overall objective and therapeutic goals should preferably be defined according to the SMART criteria.

Quality of articles: D.

#### **18 Frequency and duration of treatment (level 4)**

The intensity and frequency at which treatment has to be started should be defined for each individual patient. The duration of the treatment depends on the therapeutic goals. Treatment should be concluded as soon as the therapeutic goals have been achieved, as there is no evidence for benefits of permanent treatment of patients with RA. The therapist should, however, explain to the patient how they can maintain the goals achieved or even progress beyond them.

Quality of articles: D.

**Therapeutic process****19 Exercise therapy (levels 1 and 4)**

Based on currently available evidence and best practice, the guideline development team recommends that patients with RA (including those with a high level of disease activity) are offered a high-intensity exercise program aimed at improving aerobic capacity and muscle power / muscle endurance. This program can be supplemented by ROM exercises to maintain joint mobility. Depending on individual therapeutic goals, exercises to improve joint stability or coordination can also be added to the program (level 1).

In individual cases, the therapist may decide to start the therapy at moderate intensity and increase the intensity gradually; this is especially recommended for patients (level 4):

- who have prosthetic joints or whose joints show severe radiographic damage;
- whose severe physical impairments preclude high-intensity exercises;
- who are afraid to move.

The exercise program can be administered in groups and/or may include exercising in water, depending on the available facilities and the patient's preferences (level 4).

Quality of articles: A1 (Van den Ende et al., 1998<sup>4</sup>; Hurkmans et al. [manuscript in progress, update of Cochrane Review 1996]; Baslund et al., 1993<sup>5</sup>; De Jong et al., 2003<sup>6</sup>; Lyngberg et al., 1994<sup>7</sup>; Hansen et al., 1993<sup>8</sup>; Harkcom et al., 1985<sup>9</sup>; Minor et al., 1989<sup>10</sup>; Sanford-Smith et al., 1998<sup>11</sup> and Van den Ende et al., 1996<sup>12</sup>).

**20 Information and advice (level 2)**

Based on currently available evidence and best practice, the guideline development team recommends providing RA patients with information and advice about physical activity on the basis of ten principles of behavior change (see Section C.2.2) (level 2).

Quality of articles: B (van den Berg et al., 2006<sup>13</sup> and Brodin et al., 2008<sup>14</sup>).

**21 Delivering electric energy by means of devices (levels 3 and 2)**

Based on the currently available evidence and best practice, the guideline development team neither recommends nor discourages the delivery of electric energy by means of interferential therapy to improve functional status and reduce pain in patients with RA (level 3).

Based on the currently available evidence and best practice, the guideline development team neither recommends nor discourages the delivery of electric energy by means of TENS to reduce pain in patients with RA (level 2).

Quality of articles: B (Pelland et al., 2002<sup>15</sup> and Brosseau et al., 2003<sup>16</sup>).

**22 Delivering electromagnetic energy by means of devices (levels 4, 2, and 4)**

Based on best practice, the guideline development team neither recommends nor discourages the use of short-wave and ultra short-wave, infrared and ultraviolet light for patients with RA. If the patient has a high level of disease activity, the development team advises against the use of short-wave and ultra short-wave electromagnetic energy to the afflicted joint (level 4).

Based on the currently available evidence and best practice, the guideline development team cannot recommend the use of low-power laser therapy to improve functional status, reduce pain, and reduce disease activity for patients with RA (level 2).

The guideline development team advises against the use of low-level laser therapy for joints with high disease activity (level 4).

Quality of articles: B (Brosseau et al., 2005<sup>17</sup>).

**23 Delivering mechanical energy by means of devices (level 2)**

Based on the currently available evidence and best practice, the guideline development team neither recommends nor discourages the use of mechanical energy delivered by means of ultrasound (1 or 3 MHz) to improve functional status and reduce pain and disease activity in patients with RA (level 2).

Quality of articles: B (Casimiro et al., 2002<sup>18</sup>).

**24 Delivering or extracting thermal energy (levels 2 and 4)**

Based on the currently available evidence and best practice, the guideline development team neither recommends nor discourages the use of hot and cold thermotherapy modalities to improve functional status and reduce pain in patients with RA (level 2).

The guideline development team advises against the delivery of heat to joints with high disease activity (level 4).

Quality of articles: B (Robinson et al., 2002<sup>19</sup> and Hirvonen et al., 2006<sup>20</sup>).

**25 Massage (level 4)**

Based on best practice, the guideline development team neither recommends nor discourages the use of massage to reduce pain and improve sleep patterns and psychological well-being in patients with RA (level 4).  
Quality of articles: C (Brownfield, 1998<sup>21</sup>).

**26 Manually moving joints ('passive movement') (level 4)**

Based on best practice, the guideline development team neither recommends nor discourages passive mobilization to reduce pain in patients with RA. The development team advises against passive mobilization of the cervical vertebrae (level 4).  
Quality of articles: C (Dhondt et al., 1999<sup>22</sup>).

**27 Passive hydrotherapy or balneotherapy (levels 2 and 4)**

Based on the currently available evidence and best practice, the guideline development team does not recommend the use of balneotherapy as a monotherapy to improve functional status and reduce disease activity in patients with RA (level 2). If combined with exercise therapy (as is often done in health resorts), balneotherapy with the aim of improving functional status and reducing disease activity in patients with RA may be used for a limited period (level 4). The main aim is to mobilize RA patients and keep them moving.  
Quality of articles: B (Verhagen et al., 2003<sup>23</sup>).

**28 Combination treatment (levels 2, 2, and 4)**

Based on best practice, the guideline development team recommends the use of a combination of exercise therapy and education to improve the functional status of patients with RA (level 2). Based on the currently available evidence and best practice, the guideline development team neither recommends nor discourages the use of combinations of exercise therapy and paraffin baths, faradic baths, radon baths, thermotherapy, or ultrasound to improve functional status and reduce disease activity in patients with RA (level 2). The guideline development team advises against the use of such combination therapies for joints with high disease activity (level 4).  
Quality of articles: A2 and B (Bell et al., 1998<sup>24</sup>; Buljina et al., 2001<sup>25</sup> and Hawkes et al., 1986<sup>26</sup>).

**29 Treatment of patients with RA (level 4)**

Based on the currently available evidence and best practice, the guideline development team strongly recommends an active treatment policy. Passive interventions may be considered for a limited period of time in individual cases (level 4).  
Quality of articles: D.

## Literature

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- 9 Harkcom TM, Lampman RM, Banwell BF, Castor CW. Therapeutic value of graded aerobic exercise training in rheumatoid arthritis. *Arthritis Rheum.* 1985;28;1:32-39. 1985.
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## Supplement 2 Measurement instruments

### 2.1 Health Assessment Questionnaire (HAQ)

See [www.nvr.nl](http://www.nvr.nl), under Measurement Instruments.

### 2.2 Questionnaire on Patient-Specific Complaints (PSC)

[This PSC questionnaire should be completed by the patient.]

Your health problems affect everyday activities and movements that are difficult to avoid. RA can have different consequences for different people, and individual patients will have specific activities and movements that they would like to see improved by treatment.

The list below includes a number of activities and movements that you may find very difficult because of your RA-related problems. Try to indicate the RA-related problems you were faced with over the last week.

Tick the box corresponding to the activity to indicate those problems you consider to be VERY IMPORTANT and which you would most want to SEE CHANGED over the NEXT FEW MONTHS.

- lying in bed
- turning over in bed
- getting up from the bed
- getting up from a chair
- sitting down on a chair
- remaining seated for a longer period
- getting into and out of a car
- travelling in a car or on a bus
- cycling
- standing
- standing for a longer period
- light jobs in and around the house
- heavy jobs in and around the house
- walking indoors
- going for a walk
- running
- carrying an object
- picking something up from the floor
- lifting objects
- visiting relatives, friends or acquaintances
- going out
- sexual activities
- working professionally
- working on hobbies
- carrying out housework
- engaging in sport
- travelling
- other activities: .....

The five most important activities are:

- 1 .....
- 2 .....
- 3 .....
- 4 .....
- 5 .....

This example shows you how to answer the following questions relating to the problem of 'going for a walk'

Placing the line further to the left means that going for a walk is not very difficult for you.



Placing the line further to the right means that going for a walk is very difficult for you.



Problem 1 .....

How difficult was it for you to carry out this activity over the past week?



Date when you filled this in: .....

Problem 2 .....

How difficult was it for you to carry out this activity over the past week?



Date when you filled this in: .....

Problem 3 .....

How difficult was it for you to carry out this activity over the past week?



Date when you filled this in: .....

Note: the overall score is the sum (in millimeters) of the three activities that caused you the greatest difficulties.

### 2.3 Visual Analog Scales (VAS)

#### **Pain**

On average, how much pain did you have during the last week?



#### **Morning stiffness**

On average, how much morning stiffness did you experience during the last week?



## 2.4 Shoulder Function Assessment (SFA)

Patiënt: \_\_\_\_\_  
Date: \_\_\_\_\_

### A. Pain when moving

no pain \_\_\_\_\_ maximum pain

Pain at rest  
no pain \_\_\_\_\_ maximum pain

\* no pain = 10 points; maximum pain = 0 points \_\_\_\_\_ points\* (max. 20 points)

### B. Activities of daily living

	no problems (5 pnt)	few problems (3 pnt)	serious problems (2 pnt)	with assistance (1 pnt)	impossible (0 pnt)
getting dressed					
combing your hair					
washing the other armpit					
using the toilet					

\_\_\_\_\_ points (max. 20 points)

### C. Range of motion

Total abduction, active: 1 point per 10° of motion (maximum 18 points) \_\_\_\_\_ points

Combined motion (max. 12 points)	possible (6 points.)	possible to some extent (3 points)	impossible (0 points)
Hand on head, elbow pointing backward			
Hand on head, elbow pointing forward			

\_\_\_\_\_ points (max. 30 points)

Total of A to C \_\_\_\_\_ points (max. 70 points)

The overall score ranges from 0 points (highly restricted shoulder function) to 70 points (unrestricted shoulder function).

## Literature

- Ende CH van den, Rozing PM, Dijkmans BA, Verhoef JA, Voogt-van der Harst EM Hazes JM. Assessment of shoulder function in rheumatoid arthritis. J Rheumatol. 1996; Dec;23(12):2043-8.
- Vermeulen HM, Breedveld FC, Le Cessie S, Rozing PM, Ende CH van den, Vliet Vlieland TP. Responsiveness of the shoulder function assessment scale in patients with rheumatoid arthritis. Ann Rheum Dis. 2006; Feb;65(2):239-41.

**2.5 Elbow Function Assessment (EFA)**

Patiënt: \_\_\_\_\_  
Date: \_\_\_\_\_

**A. Pain when moving**

no pain \_\_\_\_\_ maximum pain\*

Pain at rest  
no pain \_\_\_\_\_ maximum pain\*\*

\* no pain for VAS-rest = 10 points \*\* no pain for VAS-movement = 20 points

\_\_\_\_\_ points (max. 30 points)

**B. Activities of daily living**

	no difficulty (5 points)	little difficulty (3 points)	much difficulty (2 points)	with assistance (1 point)	impossible (0 points)
Lifting a cup to one's mouth					
Using a spoon to eat					
Lifting a pan with 1 liter of water					
Pouring water from a pan into a glass					
Holding a telephone on the ipsilateral side					
Cutting with a knife					
Drawing an object towards one across the table					

\_\_\_\_\_ points (max. 35 points)

**C. Range of motion**

*Active ROM (maximum 25 points)*

Active flexion	<input type="checkbox"/> $\geq 125^\circ$	= 15 points
	<input type="checkbox"/> $100^\circ - 125^\circ$	= 10 points
	<input type="checkbox"/> $75^\circ - 100^\circ$	= 5 points
	<input type="checkbox"/> $< 75^\circ$	= 0 points
Flexion contractures	<input type="checkbox"/> $\leq 20^\circ$	= 10 points
	<input type="checkbox"/> $20^\circ - 40^\circ$	= 5 points
	<input type="checkbox"/> $\geq 40^\circ$	= 0 points

*Combined movement (maximum 10 points)*

Touching the ear on the contralateral side by moving the arm in front of the head

<input type="checkbox"/> without any trouble	= 10 points
<input type="checkbox"/> with some trouble	= 5 points
<input type="checkbox"/> impossible	= 0 points

\_\_\_\_\_ points (max. 35 points)

Total of A to C \_\_\_\_\_ points (max. 100 points)

The overall score ranges from 0 points (very restricted elbow function) to 70 points (very good elbow function).

## Literature

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## 2.6 EPM-ROM

Mobility should be assessed for each individual joint, recording a score for each.

3 points	2 points	1 point	0 points	Right		Left	0 points	1 point	2 points	3 points
> 70° < 80°	110°-80°	30°-70° 130°-110°	0°-30° 150°-130°	elbow	extension* flexion	elbow	0°-30° 150°-130°	30°-70° 130°-110°	110°-80°	> 70° < 80°
< 30° < 30°	55°-30° 55°-30°	70°-55° 70°-55°	90°-70° 80°-70°	wrist	flexion extension	wrist	90°-70° 80°-70°	70°-55° 70°-55°	55°-30° 55°-30°	< 30° < 30°
< 20° < 30°	35°-20° 50°-30°	45°-35° 70°-50°	90°-70°	thumb	abduction flexion IP	thumb	45°-35° 90°-70°	35°-20° 70°-50°	50°-30°	< 20° < 30°
< 30°	50°-30°	70°-50°	90°-70°	fingers (av.)	flexion MCP	fingers (av.)	90°-70°	70°-50°	50°-30°	< 30°
< 30°	90°-30°	120°-90°	130°-120°	hip	flexion	hip	130°-120°	120°-90°	90°-30°	< 30°
> 30°	10°-25°	5°-10°	0°	knee	extension*	knee	0°	5°-10°	10°-25°	> 30°
< 10°	25°-10°	35°-25°	45°-35°	ankle	extension	ankle	45°-35°	35°-25°	25°-10°	< 10°

av. = average; IP = interphalangeal joint; MCP: metacarpophalangeal joint

\* Restricted extension may result in contracture of the knee in flexion.

Overall score:  max. 60 points)

The overall score ranges from 0 points (no restriction of joint mobility) to 60 points (seriously restricted joint mobility).

## Literature

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## 2.7 Timed Up and Go-test (TUG)

The Timed Up-and-Go test measures the speed with which a person can comfortably:

- get up from a chair to stand straight;
- walk three meters;
- turn around;
- walk back to the chair; and
- sit down again.

At the start, the patient is sitting on the chair (elevation of seat approx. 45 cm) with their feet on the ground. The patient's arms are resting on the armrests of the chair. The patient is allowed to use a walking aid if necessary.

The patient should be able to walk without someone's assistance.

The physical therapist should record the time it takes the patient to complete the test.

## Literature

Podsiadlo D, Richardson S. The timed 'up and go': A test of basic functional mobility for frail elderly persons. JAGS. 1991;39:142-8.

## 2.8 Borg scale

While you are exercising, we would like to use this scale to record your 'perceived' exertion, in other words how heavy and demanding the exercises appear to you and how tired you feel. You can feel this 'perceived exertion' as muscle fatigue, feeling out of breath or perhaps painful twinges.

Try to estimate your perceived exertion and fatigue as honestly as possible, without thinking about the actual physical strain. Try not to underestimate nor overestimate the exertion. What matters is your own sense of exertion, not how this relates to the perceptions of others. Base your score on the overall exertion you perceive, even though in some cases it may be interesting to give separate scores for 'feeling out of breath' and muscle fatigue.

As a patient, you may also have other symptoms that could be scored, such as chest pain or pain in your joints. You can use these experiences during the exercise to monitor the intensity of the exercise.

Have a look at the scale and its descriptions and then give a score.

You can use all the numbers on the scale, not just those that are accompanied by a description.

Do you have any further questions?

Borgscore	Level of exertion
6	nothing at all
7	extremely light exertion
8	very light exertion
10	light exertion
11	somewhat heavy exertion
13	heavy exertion
15	very heavy exertion
19	extremely heavy exertion
20	maximum exertion

## Literature

Borg G. Perceived exertion as an indicator of somatic stress. Scand J Rehab Med. 1970;(2):92-8.

## 2.9 Timed chair-stand test

### Materials

- a chair, preferably without armrests;
- stopwatch;
- recording form (optional).

### Preparations

Place the chair with its back against a wall, to ensure the patient's safety.

### Instructions

Explain to the patient that he/she should sit on the chair with their arms crossed in front of the chest. If the chair has armrests, the patient is not allowed to use them.

Demonstrate the test first and explain that the patient should get up from the chair and sit down again five times in a row.

Ask the patient to do this as quickly as they can. Placing the back of the chair against a wall provides extra safety. Record the time it takes the patient to complete the task.

### Results

If the patient needs 14 seconds or more, or is incapable of doing the test, they are at increased risk of falling.

## Literature

- Rikli RE, Jones CJ. Senior Fitness Test Manual. Champaign, IL: Human Kinetics; 2001.  
Jones CJ, Rikli RE, Beam WC. A 30-second chair stand test as a reliable and valid measure of lower body strength in older adults. Res Q Exerc Sport. 1999;70:13-19.  
Rikli RE, Jones CJ. The development and validation of a functional fitness test for community-residing older adults. J Aging Phys Act. 1999;7:129-61.  
Rikli RE, Jones CJ. Functional fitness normative scores for community-residing older adults, ages 60-94. J Aging Phys Act. 1999;7:162-81.

## Supplement 3 Materials for professional development

### Assessment form

The *KNGF Guideline on Rheumatoid Arthritis* describes the physical therapy treatment of patients with rheumatoid arthritis (RA), based as much as possible on scientific evidence. This assessment form includes a number of activities and interventions that were selected from the Guideline as they represent important quality criteria for the examination and treatment of patients with RA-related health problems.

You can systematically check whether you are treating your patients in accordance with the KNGF Guideline by checking off each item. You can also indicate why you deviate from the guidelines in specific cases.

You can use this form in two ways:

1. *Without having read the Guideline first.*

You then use the form as an instrument for self-evaluation or knowledge assessment. If you are already complying with most of the recommendations, this means you are largely working in accordance with the guidelines. You can then read those items in the Guideline document which you do not yet comply with.

2. *After having read the Guideline.*

You then use the instrument as a checklist for the extent to which you are implementing the KNGF recommendations in your own practice. If you wish, you can supplement the list with items from the Guideline that you consider to be essential for the quality of your work, resulting in a personal checklist to support your work as a therapist. If you use it as such, it might be useful to make a number of copies of the list, so you can use it for each patient with RA-related health problems. The form allows you to indicate your arguments for deviating from the guidelines for a specific patient.

### Key points from the Guideline

#### Diagnostic process

- The diagnostic process should involve asking specific questions to ascertain whether the consequences of RA that the patient is having to cope with are within the physical therapist's scope of competence.
- The diagnostic process should involve ascertaining whether the diagnosis of RA was actually established by a rheumatologist.
- The physical therapist should use the Health Assessment Questionnaire (HAQ) to objectively assess the patient's functional status.
- The physical therapist should use a visual analog scale (VAS) to objectively assess pain, morning stiffness and fatigue.
- The therapist should ask the patient to indicate their views on their current health status.
- The diagnostic process should primarily focus on aspects of activities and participation, and subsequently on the impairments underlying the patient's activity limitations and participation restrictions.

#### Analysis and treatment plan

- Based on the patient's expressed care requirements, the therapist, in consultation with the patient, should draw up a treatment plan and implement the treatment.
- The treatment plan should take account of any potentially relevant facilitators or barriers.
- The treatment plan should preferably include 'SMART' therapeutic goals.

#### Therapeutic process

- The treatment of RA patients should focus on activity limitations and participation restrictions, rather than on body functions and structure.
- The physical therapist should preferably offer RA patients active treatment (e.g. exercise therapy).
- Treatment of RA patients should preferably be target-oriented.
- At the conclusion of the treatment, the therapist should explain to the patient how they can maintain the goals achieved and perhaps even progress beyond them.

**Evaluation**

- The Arthritis Impact Measurement Scale (AIMS) is a suitable instrument to evaluate the patient's functional status.
- The treatment should be terminated when the therapeutic goals have been achieved or when no further favorable effects of treatment are to be expected.
- The therapist should report to the referring doctor about the therapeutic goals, the results of the treatment and the recommendations made to the patient, at least at the end of the treatment period, and possibly also during the treatment period (see also the KNGF Guideline on informing general practitioners).
- The physical therapist should record the treatment data in a report (see also the KNGF Guideline on reporting about physical therapy).

**Discussion guide to facilitate discussing the Guideline with colleagues**

The *KNGF Guideline on Rheumatoid Arthritis* describes the currently preferred physical therapy treatment of patients with RA-related health problems, based as much as possible on scientific evidence. The purpose of this discussion guide is to facilitate discussions of the Guideline with your peers. The guide can also be used as an individual test of your knowledge.

The discussion guide presents a number of statements about key points in the Guideline, which help you go through the Guideline, individually or in a group discussion.

You can use the guide in various ways:

- You can define your own individual opinions about the statements.
- You can discuss these opinions with a group of colleagues.
- You can check what the Guideline says about these statements and what evidence it presents, and then discuss the consequences for the way you treat RA patients.

**Statements**

- 1 The diagnostic process focuses primarily on limitations of activities and participation, and subsequently on impairments underlying these problems.
- 2 The treatment plan and its implementation are based on the patient's expressed care requirements and expectations.
- 3 The most important aspect of the treatment of RA patients is treating the impairments of body function and structure.
- 4 The ultimate goal of treatment is for the patient to achieve the normal, or preferred, level of activity and participation.
- 5 It is important to take facilitators and barriers into account when defining the therapeutic goals.
- 6 The role of the physical therapist when treating patients with RA is that of a coach rather than a hands-on therapist.
- 7 Effective therapeutic care for patients with RA is characterized by:
  - effective education and discussion about diagnostics and therapy;
  - focusing on functional exercise;
  - helping patients to effectively cope with their complaints;
  - target-oriented approach;
  - stimulating self-efficacy and an active lifestyle during and after the therapy;
  - efficient use of therapy sessions, in terms of number, duration and frequency.
- 8 The use of questionnaires offers added value in evaluating therapy outcomes for patients with RA.

**After having read the KNGF Guideline, do you agree with the following statements?**

- 9 The Guideline presents a clear description of the screening and diagnostic process for patients with RA and offers a systematic structure for its implementation.
- 10 The Guideline presents a clear description of the therapeutic process for patients with RA and offers a systematic structure for its implementation.
- 11 The recommendations offered in the KNGF Guideline on rheumatoid arthritis fit in with my/our current practice.

**Discussion guide to facilitate the collaboration between physical therapists and rheumatologists and/or general practitioners**

This discussion guide offers practical suggestions for discussing the subject of rheumatoid arthritis. The goals of the discussion are decided upon by you and your discussion partner(s), and may involve exchanging information, coming to concrete agreements or evaluating what you had agreed previously.

The *KNGF Guideline on rheumatoid arthritis* describes how physical therapists can help RA patients achieve the best possible functional status. The Guideline explicitly discusses the place of physical therapists in the care process, based on their specific expertise and on research evidence.

Discussions between physical therapists and rheumatologists and/or general practitioners, whether at national or local level, about what each has to offer and about the specific expertise and skills of physical therapists, can help patients achieve their best possible functional status. The goal of such discussions is to develop a joint policy, close collaboration and consultations between physical therapists and rheumatologists and/or general practitioners.

**Steps in the process: information exchange – agreements – evaluation**

The rheumatologist and/or general practitioner should select a few patients with RA to serve as examples cases, preferably patients for whom physical therapy is indicated and who are being treated, or have been treated in the past, by the physical therapist taking part in the discussion (or one of them if the discussion involves more than one therapist).

- 1 The rheumatologist or general practitioner presents a patient's case by way of example and explains why he or she thinks physical therapy is indicated for this patient or not, discussing:
  - the patient's characteristics;
  - their own management and possible alternatives;
  - the timing of referral;
  - why he or she decided to use a particular therapy or to make use of the physical therapist's expertise;
  - expectations regarding the outcome of the therapy.
- 2 The physical therapist explains his or her approach in this particular case, discussing:
  - the conclusions drawn from the screening and diagnostic process;
  - the patient's activity limitations and participation restrictions;
  - which of the patient's impairments of body function and structure can be modified by physical therapy;
  - the short-term and long-term therapeutic goals;
  - the forms of physical therapy applied;
  - the expected outcome.
- 3 The discussion should also cover the contents of the *KNGF Guideline on Rheumatoid Arthritis* and the patient's management by the general practitioner and the rheumatologist.
- 4 Points for discussion:
  - the importance of stimulating exercise;
  - setting a timetable for the achievement of the various therapeutic goals;
  - the main components of therapy: information/advice, supervised exercise;
  - the disadvantages of therapy focusing primarily on impairments of body function and structure;
  - treatment focusing on activities (functional exercises);
  - limiting the use of passive therapeutic methods, such as physical modalities;
  - the need to stimulate patients to maintain physical activity during and after the therapy period.
- 5 The rheumatologist and/or the general practitioner should come to agreements with the physical therapist(s) about the management of RA-related health problems, which they should confirm in writing, including:
  - the criteria used to decide whether physical therapy is indicated (such as the nature of the health problem and patient characteristics);
  - at what point in time physical therapy is indicated;
  - the management by the rheumatologist, the general practitioner and the physical therapist;
  - the timing and method of evaluation.
- 6 The rheumatologist, general practitioner and physical therapist should work according to their agreements on the management of RA patients for a defined period of time, after which they should evaluate their experiences and if necessary adjust the agreements.

## Supplement 4 Glossary

activity	any aspect of human actions
co-morbidity	the presence of other disorders that may compromise the patient's health status
coping	the cognitive and behavioral exertions by an individual to control, reduce and tolerate internal or external demands imposed by a stressor
environmental factors	external factors impacting on functional status
function	a physiological or mental quality of the human organism
handheld dynamometer	an instrument to measure muscle power
idiopathic	of unknown origin
impairment	an abnormality of body function or structure
incidence	the number of new cases of a particular disease in a community during a defined period (e.g. a year)
limitation	difficulties experienced by an individual when trying to engage in an activity
meta-analysis	a review paper based on a systematic search for relevant literature, whose conclusion is based on a quantitative combination of the results of all included studies
muscle power:	functions relating to the power resulting from the contraction of a muscle or muscle group
participation	the extent to which an individual participates in society
personal factors	internal factors impacting on functional status
physical condition	umbrella term for the following ICF terms: <ul style="list-style-type: none"> <li>• exercise tolerance (body functions relating to the respiratory and cardiovascular capacity required to sustain physical exertion)</li> <li>• muscle endurance</li> <li>• mental energy level (mental power and endurance)</li> </ul>
prevalence	the number of cases of a disease among the population at a certain moment in time
prognostic factors	factors affecting the persistence of complaints; factors which may have a favorable or unfavorable effect on the development of a patient's complaints, in the latter case increasing the risk that the complaints will persist or increase
structure	anatomic characteristics of components of the human organism, such as position, presence, shape and continuity; components of the human organism comprise body parts, organ systems, organs and parts of organs
systematic review	review paper based on a systematic search for relevant literature, whose conclusion is a qualitative description of the results of all included studies



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