Package of interventions for Rehabilitation

Module 2

Musculoskeletal conditions

World Health Organization

Package of interventions for rehabilitation

Module 2
Musculoskeletal conditions

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Package of interventions for rehabilitation. Module 2. Musculoskeletal conditions

(Package of interventions for rehabilitation. Module 1. Introduction – Module 2. Musculoskeletal conditions – Module 3. Neurological conditions – Module 4. Cardiopulmonary conditions – Module 5. Neurodevelopmental disorders – Module 6. Sensory conditions – Module 7. Malignant neoplasm – Module 8. Mental health conditions)

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Contents

1 Package of interventions for rehabilitation for low back pain

1.1 About low back pain

Low back pain is a condition that many people experience during their lifetime and is the leading cause of years lived with disability. The prevalence rates of low back pain accelerate from about 15 years of age and peak in older age (80–89 years) *(1)*. Low back pain is defined as primary when the persistent or recurrent pain is not reliably attributed to an underlying disease process (e.g. an inflammatory autoimmune condition such as ankylosing spondylitis) or structural pathology (e.g. spondylosis or injury). Most individuals experience the condition as a short-term episode. However, in about one third of people, this extends to 12 months or more *(2)* or is recurrent, with several episodes experienced across the life course.

The impact of low back pain on overall functioning can be immense, depending on the intensity and duration of symptoms. While acute and short-term pain and the related limitations in functioning can restore completely, chronic low back pain is often associated with significant disability, reduced ability to participate in family, social and work roles, and incurs major financial costs to families, communities and health systems *(3)*. People with chronic symptoms are more likely to experience poverty and exit prematurely from the workforce *(4)*. The experience of disabling low back pain and early retirement due to chronic symptoms are more common among people with lower socioeconomic status *(5)*.

Role of rehabilitation in low back pain

It is estimated that in 2019, 568 million people worldwide were living with low back pain and associated problems in functioning that could benefit from rehabilitation *(6)*. Rehabilitation plays an essential role to support people in restoring and maintaining optimal levels of functioning and preventing recurrent episodes *(7)*. Importantly, for people with chronic low back pain, multidisciplinary biopsychosocial rehabilitation, including both physical exercise programmes to restore motor functions, and psychological approaches to enable people with low back pain to cope better with pain, are more effective in improving physical tolerances towards daily activities and general well-being than physical treatment alone *(8)*. Rehabilitation may also consider vocational aspects and other risk factors, whenever they contribute to the development or deterioration of the condition.

Target population for the Package of interventions for rehabilitation for low back pain

This *Package of interventions for rehabilitation for low back pain* is intended to be used for adults with chronic primary low back pain with or without leg pain (International Classification of Diseases, 11th revision (ICD-11): MG30.02 Chronic primary musculoskeletal pain and MG30.31 Chronic secondary musculoskeletal pain associated with structural changes).

Important links to other WHO products relevant for the care of people with low back pain:

- *WHO Guidelines on the management of chronic pain in children (9).*
- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (10).*
- *mhGAP Intervention guide for mental, neurological and substance use disorders in non-specialized health settings: mental health GAP Action Programme (mhGAP) – version 2.0 (11).*
- *WHO Model List of Essential Medicines (12).*

1.2 Content of the Package of interventions for rehabilitation for low back pain

Overview of the interventions for rehabilitation in low back pain

Functioning interventions

	Assessments[a]	Intervention[a]
Cognitive functions	Assessment of content of thought (catastrophizing, fear avoidance behaviour, outcome expectations, kinesiophobia)[b]	Cognitive behavioural therapy[c]
Pain management	Assessment of pain[b]	Analgesics: oral NSAIDs[b,d] Cognitive behavioural therapy[c] Joint mobilization[b] Spinal manipulative therapy[b] Physical exercise training (incl. min body exercises)[b]
Exercise and fitness	Assessment of exercise capacity[b]	Fitness training[b]
Activities of daily living	Assessment of activities of daily living (ADL)[b]	ADL training[b]
Education and vocation	Vocational assessment[b]	Vocational counselling, training, and support[b]
Lifestyle modification	Assessment of lifestyle risk factors factors[b]	Education, advice and support for healthy lifestyle[b]
Self-management		Education, advice and support self-management of the health condition[b] Education and advice on self-directed exercise[b]

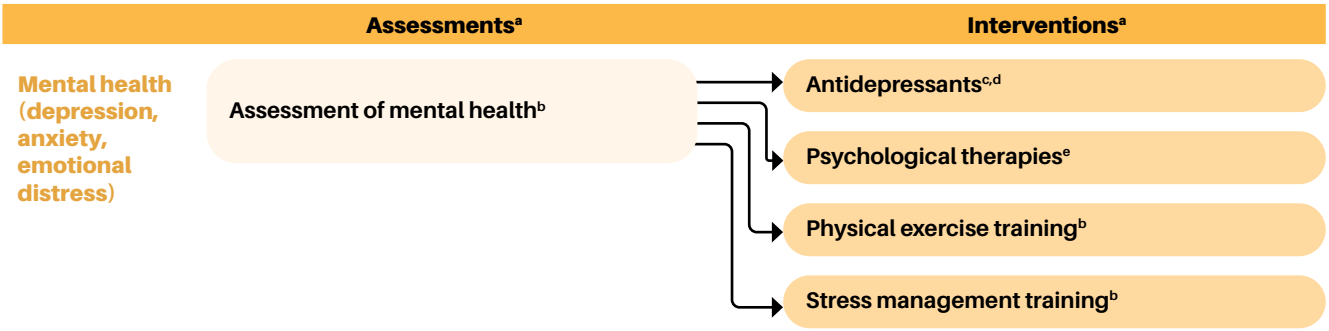
[a] See Annex 1 for definitions of assessments and interventions.

[b] Adults with acute and chronic low back pain.

[c] Adults with chronic low back pain.

[d] Medicines are included in WHO's Model List of Essential Medicines *(12)*.

Interventions for the prevention and treatment of secondary conditions related to low back pain



[a] See Annex 1 for definitions of assessments and interventions.

[b] Adults with acute and chronic low back pain.

[c] Adults with low back pain and moderate to severe depression.

[d] Medicines are included in WHO Model List of Essential Medicines *(12)*.

[e] Adults with chronic low back pain.

Overview of the resources required for rehabilitation in low back pain

Functioning interventions

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental/cognitive functions	Target: Content of thought (catastrophizing, fear avoidance beliefs, outcome expectations, kinesiophobia)					
	Assessment of content of thought	20	–	–	–	• Psychologist • Specialist medical practitioner/ PRM physician
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
Pain management	Target: Sensation of pain					
	Assessment of pain	30	–	–	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Analgesics	5	–	–	Oral NSAIDs	• Specialist medical practitioner/ PRM physician
	Physical exercise training (incl. mind body exercises)	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
	Spinal manipulative therapy	15	–	• Treatment table • Stabilization/mobilization belts • Pillows • Towels	–	• Physiotherapist
	Joint mobilization	15	–	• Treatment table • Stabilization/mobilization belt • Pillows • Towels	–	• Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Exercise and fitness	**Target: Exercise tolerance functions**					
	Assessment of exercise capacity	30	–	• Timer • Cycle ergometer (arm or leg) • Heart rate monitor	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Fitness training	30	–	• Cycle ergometer (arm or leg) • Exercise mat • Resistance bands • Weights • Exercise ball • Timer	–	• Physiotherapist
Activities of daily living	**Target: Activities of daily living (ADL)**					
	Assessment of ADL	30	–	• Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
	ADL training	30	–	• Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
Education and vocation	**Target: Work and employment**					
	Vocational assessment	90	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Vocational counselling, training, and support	60	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Lifestyle modification	**Target: Healthy lifestyle**					
	Assessment of lifestyle risk factors (incl. nutritional status)	20	–	• Measuring tape • Scale weight	–	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education, advice and support for healthy lifestyle	45	–	–	• Information materials (e.g. flyers, brochures)	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
Self-management	**Target: Self-management**					
	Education, advice and support for self-management of the health condition	45	–	–	• Information materials (e.g. flyers, brochures)	• Nursing professional • Occupational therapist • Peer counsellor • Physiotherapist • Specialist medical practitioner/ PRM physician
	Education and advice on self-directed exercises	45	–	–	• Information materials (e.g. flyers, brochures)	• Occupational therapist • Physiotherapist

ADL: activity of daily living; NSAID: non-steroidal anti-inflammatory drug; PRM: physical and rehabilitation medicine.

Interventions for the prevention and treatment of secondary conditions related to low back pain

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental health	**Target: Mental health (in particular depression, anxiety, emotional distress)**					
	Assessment of mental health	60	–	–	–	• Psychologist • Specialist medical practitioner/ PRM physician
	Antidepressants	5	–	–	• Oral antidepressants	• Specialist medical practitioner/ PRM physician
	Psychological therapies (incl. cognitive behavioural therapy)	60	–	–	–	• Psychologist
	Physical exercise training	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Stress management training	30	–	–	–	• Psychologist

PRM: physical and rehabilitation medicine.

Summary of the required material resources and workforce

Material resources

Assistive products (for prescription)	Equipment (for service facilities)	Consumables (for service facilities)
–	• Cycle ergometer (arm or leg) • Exercise ball • Exercise mats • Heart rate monitor • Measuring tape • Pillows • Resistance bands • Scale weight • Stabilization/mobilization belts • Timer • Towels • Treatment table • Utensils for activities of daily living • Weights • Work-related tools and equipment	• Information materials (e.g. flyers, brochures) **Medicines** • Oral NSAIDs • Oral antidepressants

NSAID: non-steroidal anti-inflammatory drug.

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation for low back pain (in alphabetical order)
• Dietitians and nutritionists • Nursing professionals • Occupational therapists • Physiotherapists • Psychologists • Social work and counselling professionals • Specialist medical practitioners/PRM physicians

PRM: physical and rehabilitation medicine.

1.3 Members of the working groups

The following experts have contributed to the development of the *Package of interventions for rehabilitation for low back pain* along the different development steps and using the listed clinical practice guidelines and Cochrane systematic reviews. See Annex 2 for a summary of declarations of interest.

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2 Package of interventions for rehabilitation for osteoarthritis

2.1 About osteoarthritis

Osteoarthritis is a chronic condition and the most common form of arthritis. Osteoarthritis is now considered a complex condition that is influenced by an interaction between genetic, biomechanical, metabolic, and biochemical responses. The condition is characterized by joint pain, stiffness, and swelling and can affect any joint, most commonly presenting in weight-bearing sites (e.g. knees, hips, feet, spine) and sites most subject to repetitive stresses (e.g. hands, shoulders). Osteoarthritis most frequently occurs in people above 55 years of age, although younger people can also be affected. Risk factors for the condition include joint injury, being overweight or obese, female, and older age *(1)*.

Joint pain and stiffness are typically associated with a loss of mobility and physical function, and in the hands, a loss of dexterity. The consequences of limitations in physical function and associated impacts of living with chronic pain often manifest in reduced social participation *(2)*, reduced quality of life and increased psychological distress *(3)*.

Role of rehabilitation in osteoarthritis

It is estimated that in 2019, 344 million people worldwide were living with osteoarthritis and associated problems in functioning that could benefit from rehabilitation *(4)*. While surgical interventions (including joint replacement) present one approach to advanced and disabling osteoarthritis, non-surgical interventions help people living with the condition to manage pain and maintain optimal levels of functioning. Thus, rehabilitation in osteoarthritis is essential and comprises interventions that target the joint function and the associated pain and swelling and other mobility-related functions, such as muscle strength. To maintain optimal mobility, compensatory approaches, such as the use of assistive products, can be critical. Furthermore, to support people to live well with osteoarthritis and to continue participation in meaningful activities, such as work and social life, rehabilitation promotes self-management skills and also psychological health.

Target population for the Package of interventions for rehabilitation for osteoarthritis

This *Package of interventions for rehabilitation for osteoarthritis* is intended to be used for adults with osteoarthritis at any level of severity and at any location (International Classification of Diseases, 11th revision (ICD-11): FA03 Osteoarthritis of other specified joint, but with a specific focus on osteoarthritis of the hip (ICD-11: FA00 Osteoarthritis of hip), the knee (ICD-11: FA01 Osteoarthritis of knee;), and the wrist or hand (ICD-11: FA02 Osteoarthritis of wrist or hand).

Important links to other WHO products relevant for the care of people with osteoarthritis:

- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (5).*
- *mhGAP Intervention guide for mental, neurological and substance use disorders in non-specialized health settings: mental health GAP Action Programme (mhGAP) – version 2.0 (6).*
- *WHO Model List of Essential Medicines (7).*

2.2 Content of the Package of interventions for rehabilitation for osteoarthritis

Overview of the interventions for rehabilitation in osteoarthritis

Functioning interventions

	Assessments[a]	Interventions[a]
Cognitive functions	Assessment of content of thought (catastrophizing, fear avoidance behaviour, kinesiophobia)[b]	Cognitive behavioural therapy[b]
Pain management	Assessment of pain[b]	Analgesics: Paracetamol[b,d] Oral NSAIDs[b,d] or topical NSAIDs[c,e] Intra-articular corticosteroid injections[b,e]
		Cognitive behavioural therapy[b]
		Physical exercise training[b]
		Provision and training in the use of orthosis[f]
Motor functions and mobility	Assessment of joint mobility[b]	Manual therapy[b]
	Assessment of muscle functions[b]	Muscle-strengthening exercises[b]
	Assessment of balance[g]	Balance training[g]
	Assessment of gait pattern and walking[g]	Provision and training in the use of assistive products for mobility[g]
Exercise and fitness	Assessment of exercise capacity[b]	Fitness training[b]
Activities of daily living	Assessment of activities of daily living (ADL)[b]	ADL training[b]
		Provision and training in the use of assistive products for self-care[b]
		Modification of the home environment[b]
Education and vocation	Vocational assessment[b]	Vocational counselling, training, and support[b]

[cont.]

	Assessments[a]	Interventions[a]
Lifestyle modification	Assessment of lifestyle risk factors factors[b]	Education, advice and support for healthy lifestyle[b]
Self-management		Education, advice and support self-management of the health condition[b]

[a] See Annex 1 for definitions of assessments and interventions.
[b] Adults with osteoarthritic at any location.
[c] Adults with hip and knee osteoarthritis.
[d] Medicines are included in WHO Model List of Essential Medicines *(7)*.
[e] Medicine has not yet been evaluated for inclusion in WHO Model List of Essential Medicines *(7)*.
[f] Adults with hand and knee osteoarthritis.
[g] Adults with lower limb osteoarthritis.

Interventions for the prevention and treatment of secondary conditions related to osteoarthritis

	Assessments[a]	Interventions[a]
Mental health (depression, anxiety, emotional distress)	Assessment of mental health[b]	Antidepressants[c,d] Psychological therapies[b] Physical exercise training[b] Stress management training[b]

[a] See Annex 1 for definitions of assessments and interventions.
[b] Adults with osteoarthritis at any location.
[c] Adults with orthoarthritis and moderate to severe depression or anxiety.
[d] Medicines are included in WHO Model List of Essential Medicines *(7)*.

Overview of the resources required for rehabilitation in osteoarthritis

Functioning interventions

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental/cognitive functions	**Target: Energy and drive (fatigue)**					
	Assessment of fatigue	15	–	–	–	• Psychologist • Specialist medical practitioner/ PRM physician
	Target: Content of thought (catastrophizing, fear avoidance beliefs, kinesiophobia, outcome expectations)					
	Assessment of content of thought	20	–	–	–	• Psychologist • Specialist medical practitioner/ PRM physician
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
Pain management	**Target: Sensation of pain**					
	Assessment of pain	30	–	–	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Analgesics	5	–	–	• Paracetamol • NSAIDs (oral or topical)	• Specialist medical practitioner/ PRM physician
	Intra-articular corticosteroid injections	20	–	• Treatment table	• Corticosteroids • Alcohol wipes • Gauze • Gloves • Needles and syringe	• Specialist medical practitioner/ PRM physician
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
	Manual therapy	30	–	• Treatment table • Pillows • Foam rollers/wedges	• Massage lotion	• Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Pain management	**Physical exercise training**	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Provision and training in the use of orthoses	60	• Knee orthoses • Hand orthoses	• Orthoses kit • Splinting kit (static/dynamic)	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
Motor functions and mobility	**Target: Mobility of joint functions**					
	Assessment of joint mobility	10	–	• Treatment table • Goniometer • Measuring tape	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Manual therapy	30	–	• Treatment table • Pillows • Foam rollers/wedges	• Massage lotion	• Physiotherapist
	Target: Muscle power functions					
	Assessment of muscle functions	20	–	• Treatment table • Handheld dynamometer	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Muscle-strengthening exercises	20	–	• Treatment table • Weights • Resistance bands • Exercise mat • Resistive exercise putty	–	• Occupational therapist • Physiotherapist
	Target: Involuntary movement reaction functions (balance)					
	Assessment of balance	20	–	• Timer • Measuring tape	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Balance training	20	–	• Balance board/cushion • Exercise mat • Timer	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	**Target: Gait pattern functions and walking**					
	Assessment of gait pattern and walking	30	–	• Timer • Measuring tape • Parallel bar	–	• Physiotherapist
	Target: Mobility					
	Physical exercise training	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Provision and training in the use of assistive products for mobility	30	• Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Knee orthoses	–	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
Exercise and fitness	**Target: Exercise tolerance functions**					
	Assessment of exercise capacity	30	–	• Timer • Cycle ergometer (arm or leg) • Heart rate monitor	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Fitness training	30	–	• Cycle ergometer (arm or leg) • Exercise mat • Resistance Bands • Weights • Exercise Ball • Timer	–	• Physiotherapist
Activities of daily living	**Target: Activities of daily living (ADL)**					
	Assessment of ADL	30	–	• Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
	ADL training	30	–	• Utensils for activities of daily living • Assistive products for toileting • Adapted eating and drinking products • Assistive products for dressing	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Activities of daily living	**Provision and training in the use of assistive products for self-care**	30	• Assistive products for toileting • Adapted eating and drinking products • Assistive products for dressing	–	–	• Occupational therapist • Physiotherapist
	Modification of the home environment	60	• Handrail/grab bars • Ramps, portable	• Measuring tape	–	• Occupational therapist • Physiotherapist
Work and employment	**Target: Work and employment**					
	Vocational assessment	90	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Vocational counselling, training, and support	60	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
Lifestyle modification	**Target: Healthy lifestyle**					
	Assessment of lifestyle risk factors (incl. nutritional status)	20	–	• Measuring tape • Scale weight	–	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education, advice and support for healthy lifestyle (incl. dietary advice)	45	–	–	• Information materials (e.g. flyers, brochures)	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Self-management	**Target: Self-management**					
	Education, advice and support for self-management of the health condition (incl. knowledge on osteoarthritis, weight management, ergonomic principles, pacing of activity and use of assistive devices, self-management strategies)	45	–	–	• Information materials (e.g. flyers, brochures)	• Nursing professional • Occupational therapist • Peer counsellor • Physiotherapist • Specialist medical practitioner/ PRM physician

ADL: activity of daily living; NSAID: non-steroidal anti-inflammatory drug; PRM: physical and rehabilitation medicine.

Interventions for the prevention and treatment of secondary conditions related to osteoarthritis

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental health	**Target: Mental health (in particular depression, anxiety, emotional distress)**					
	Assessment of mental health	60	–	–	–	• Psychologist • Specialist medical practitioner/ PRM physician
	Antidepressants	5	–	–	• Oral antidepressants	• Specialist medical practitioner/ PRM physician
	Psychological therapies (incl. cognitive behavioural therapy)	60	–	–	–	• Psychologist
	Physical exercise training	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Stress management training	30	–	–	–	• Psychologist

PRM: physical and rehabilitation medicine.

Summary of the required material resources and workforce

Material resources

Assistive products (for prescription)	Equipment (for service facilities)	Consumables (for service facilities)
Products for self-care • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting **Products for mobility** • Hand orthotics • Knee orthotics • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Handrail/grab bars • Ramps, portable	**Specific for assessments** • Goniometer • Handheld dynamometer • Measuring tape • Scale weight **For interventions** • Utensils for activities of daily living • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting • Orthoses kit • Splinting kit (static/dynamic) • Foam rollers/wedges • Pillows • Treatment table • Resistance bands • Resistive exercise putty • Weights • Exercise balls • Exercise mat • Balance board/cushion • Cycle ergometer (arm or leg) • Parallel bar • Timer • Work-related tools and equipment	• Alcohol wipes • Gauze • Gloves • Information materials (e.g. flyers, brochures) • Massage lotion • Needles and syringe **Medicines** • Corticosteroids • NSAIDs (oral or topical) • Oral antidepressants • Paracetamol

NSAID: non-steroidal anti-inflammatory drug.

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation for osteoarthritis (in alphabetical order)
• Dietitians and nutritionists • Nursing professionals • Occupational therapists • Physiotherapists • Psychologists • Social work and counselling professionals • Specialist medical practitioners/PRM physicians

PRM: physical and rehabilitation medicine.

2.3 Members of the working groups

The following experts have contributed to the development of the *Package of interventions for rehabilitation for osteoarthritis* along the different development steps and using the listed clinical practice guidelines and Cochrane systematic reviews. See Annex 2 for a summary of declarations of interest.

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3 Package of interventions for rehabilitation for rheumatoid arthritis

3.1 About rheumatoid arthritis

Rheumatoid arthritis is an autoimmune inflammatory disease that primarily affects synovial joints, particularly the small joints of the hands, wrists, and feet, but may affect any synovial joint. Systemic inflammation leads to joint swelling and the potential for degradation of articular and periarticular tissues. Typical signs and symptoms of rheumatoid arthritis include pain, stiffness, tenderness and swelling in one or more joints, along with general malaise and fatigue, which often lead to physical deconditioning. Since rheumatoid arthritis is a systemic disease, there are multiple extra-articular conditions, such as cardiovascular disease, that may affect well-being and functioning *(1)*. The specific causes for the disease are unknown but several risk factors have been identified, such as age, gender (female), smoking, and obesity *(2)*. Several key prevention strategies have also been proposed *(3)*.

The chronic and progressive nature of rheumatoid arthritis may result in destruction of joints and an increase in related symptoms if disease activity is not controlled early. This again can lead to deterioration in the capacity to perform physical activities and also to reduced mental health *(4)*. In the more severe cases, rheumatoid arthritis can cause significant restrictions in work and social life, overall loss of independence, and quality of life *(5)*.

Role of rehabilitation in rheumatoid arthritis

It is estimated that in 2019, 13 million people worldwide were living with rheumatoid arthritis and associated problems in functioning that could benefit from rehabilitation *(6)*. Rehabilitation is an essential service that aims to achieve and maintain optimal levels of functioning in people with rheumatoid arthritis, and thereby has the potential to improve independence and quality of life *(4)*. Interventions for rehabilitation address both the symptoms related to the disease, such as pain, stiffness, or fatigue, as well the factors that impact the disease activity and comorbidities, such as nutrition or lack of physical activity. In addition, rehabilitation helps people to develop strategies to self-manage and cope with the physical and mental consequences of the disease, and to achieve optimal levels of independence in activities of daily living and meaningful activities such as work.

Target population for the Package of interventions for rehabilitation for rheumatoid arthritis

This *Package of interventions of rehabilitation for rheumatoid arthritis* is intended to be used for adults with rheumatoid arthritis at any level of severity, and independent of the location of the affected joints (International Classification of Diseases, 11th revision (ICD-11): FA20 Rheumatoid arthritis).

Important links to other WHO products relevant for the care of people with rheumatoid arthritis:

- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (7).*
- *mhGAP Intervention guide for mental, neurological and substance use disorders in non-specialized health settings: mental health GAP Action Programme (mhGAP) – version 2.0 (8).*
- *WHO Model List of Essential Medicines (9).*

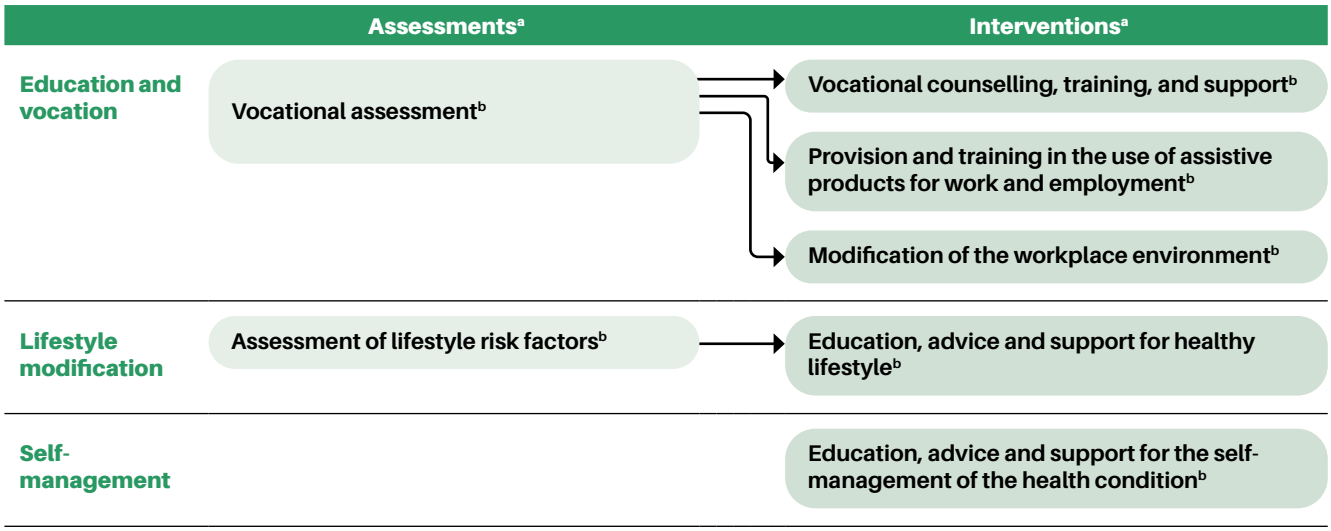
3.2 Content of the Package of interventions for rehabilitation for rheumatoid arthritis

Overview of the interventions for rehabilitation in rheumatoid arthritis

Functioning interventions

	Assessments[a]	Interventions[a]
Cognitive functions	Assessment of fatigue[b]	Physical exercise training[b] Cognitive behavioural therapy[b]
Pain management	Assessment of pain[b]	Analgesics: Oral NSAIDs[b,c] Intra-articular corticosteroid injections[b,d] Cognitive behavioural therapy[b] Physical exercise training[b] Provision and training in the use of orthosis[b]
Motor functions and mobility	Assessment of joint mobility (and integrity)[b]	Range of motion exercises[b] Provision and training in the use of orthosis[b]
	Assessment of muscle functions[b]	Muscle-strengthening exercises[b]
	Assessment of mobility[e]	Provision and training in the use of assistive products for mobility[e]
Exercise and fitness	Assessment of exercise capacity[b]	Fitness training[b]
Activities of daily living	Assessment of activities of daily living (ADL)[b]	ADL training[b] Provision and training in the use of assistive products for self-care[b] Modification of the home environment[b]

[cont.]



[a] See Annex 1 for definitions of assessments and interventions.

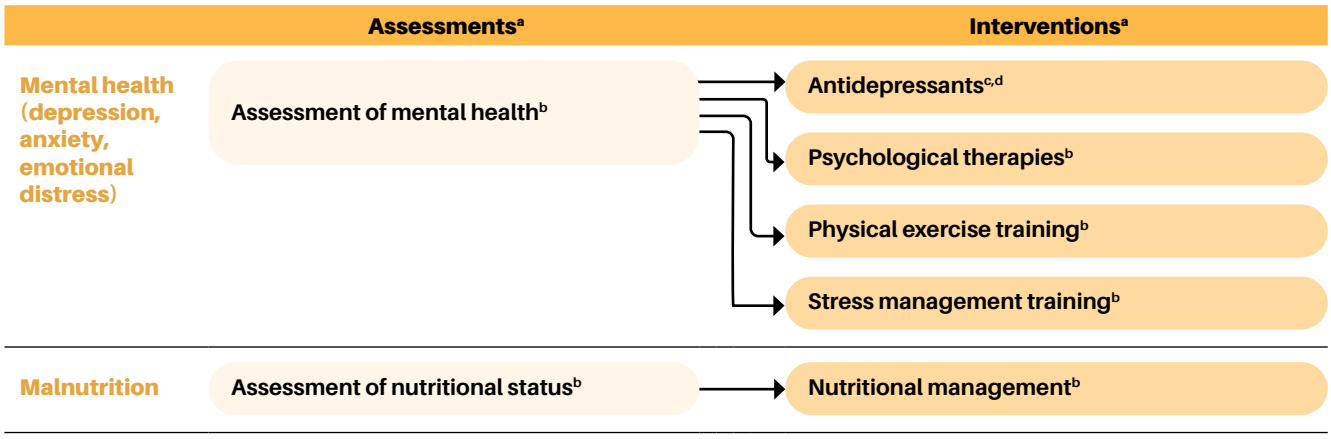
[b] Adults with rheumatoid arthritis (all types and locations).

[c] Medicines are included in WHO Model List of Essential Medicines *(9)*.

[d] Medicine has not yet been evaluated for inclusion in WHO Model List of Essential Medicines *(9)*.

[e] Adults with rheumatoid arthritis with lower limb involvement.

Interventions for the prevention and treatment of secondary conditions related to rheumatoid arthritis



[a] See Annex 1 for definitions of assessments and interventions.

[b] Adults with rheumatoid arthritis (all types and locations).

[c] Adults with rheumatoid arthritis (all types and locations) and moderate to severe depression or anxiety.

[d] Medicines are included in WHO Model List of Essential Medicines *(9)*.

Overview of the resources required for rehabilitation in rheumatoid arthritis

Functioning interventions

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental/cognitive functions	**Target: Energy and drive (fatigue)**					
	Assessment of fatigue	15	–	–	–	• Psychologist • Specialist medical practitioner/PRM physician
	Physical exercise training	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
Pain management	**Target: Sensation of pain**					
	Assessment of pain	30	–	–	–	• Physiotherapist • Specialist medical practitioner/PRM physician
	Analgesics	5	–	–	• Non-steroidal anti-inflammatory drugs (NSAIDs)	• Specialist medical practitioner/PRM physician
	Intra-articular corticosteroid injections	20	–	• Treatment table	• Corticosteroids • Alcohol wipes • Gloves • Needles and syringe • Antiseptic wipes	• Specialist medical practitioner/PRM physician
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
	Physical exercise training	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Pain management	**Provision and training in the use of orthosis** (static; incl. splints)	60	• Orthoses, lower limb • Orthoses, upper limb • Orthoses, spinal/cervical	• Orthoses kit • Splinting kit (static/dynamic)	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
Motor function and mobility	**Assessment of joint mobility (and integrity)**	10	–	• Treatment table • Goniometer • Measuring tape	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/PRM physician
	Range of motion exercises	15	–	• Treatment table	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of orthosis (static)	60	• Orthoses, lower limb • Orthoses, upper limb • Orthoses, spinal/cervical	• Orthoses kit • Splinting kit (static/dynamic)	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
	Target: Muscle power functions					
	Assessment of muscle functions	20	–	• Treatment table • Handheld dynamometer	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/PRM physician
	Muscle-strengthening exercises	20	–	• Treatment table • Weights • Resistance bands • Exercise mat • Resistive exercise putty	–	• Occupational therapist • Physiotherapist
	Target: Mobility					
	Assessment of mobility	30	–	–	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
	Provision and training in the use of assistive products for mobility	30	• Cane/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Therapeutic footwear • Wheelchairs, manual • Pressure cushion	• Orthoses kit	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
Exercise and fitness	**Target: Exercise tolerance functions**					
	Assessment of exercise capacity	30	–	• Timer Cycle ergometer (arm or leg) • Heart rate monitor	–	• Physiotherapist • Specialist medical practitioner/PRM physician
	Fitness training	30	–	• Cycle ergometer (arm or leg) • Exercise mat • Resistance bands • Weights • Exercise ball • Timer	–	• Physiotherapist
Activities of daily living	**Target: Activities of daily living (ADL)**					
	Assessment of ADL	30	–	• Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
	ADL training	30	–	• Utensils for activities of daily living • Assistive products for toileting • Adapted eating and drinking products • Assistive products for dressing	–	• Occupational therapist • Physiotherapist
	Provision of assistive products for self-care	30	• Assistive products for toileting • Adapted eating and drinking products • Assistive products for dressing	–	–	• Occupational therapist • Physiotherapist
	Modification of the home environment	60	• Handrail/grab bars • Ramps, portable	• Measuring tape	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Education and vocation	**Target: Work and employment**					
	Vocational assessment	90	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Vocational counselling, training and support	60	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Provision of assistive products for work and employment	30	• Assistive products to adapt workstation	–	–	• Occupational therapist • Physiotherapist
	Modification of the workplace environment	60	• Ramps, portable	• Measuring tape	–	• Occupational therapist • Physiotherapist
Lifestyle modification	**Target: Healthy lifestyle**					
	Assessment of lifestyle risk factors	20	–	• Measuring tape • Scale weight	–	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/PRM physician
	Education, advice and support for healthy lifestyle	45	–	–	• Information materials (e.g. flyers, brochures)	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/PRM physician
Self-management	**Target: Self-management**					
	Education, advice and support for self-management of the health condition (incl. joint protection principles, energy conservation strategies, depression and anxiety, activities of daily living, parenting)	45	–	–	• Information materials (e.g. flyers, brochures)	• Nursing professional • Occupational therapist • Peer counsellor • Physiotherapist • Specialist medical practitioner/PRM physician

ADL: activity of daily living; NSAID: non-steroidal anti-inflammatory drug; PRM: physical and rehabilitation medicine.

Interventions for the prevention and treatment of secondary conditions related to rheumatoid arthritis

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental health	**Target: Mental health (in particular depression, anxiety, emotional distress)**					
	Assessment of mental health	60	–	–	–	• Specialist medical practitioner/ PRM physician • Psychologist
	Antidepressants	5	–	–	• Oral antidepressants	• Specialist medical practitioner/ PRM physician
	Psychological therapies (incl. cognitive behavioural therapy)	60	–	–	–	• Psychologist
	Physical exercise training	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Stress management training	30	–	–	–	• Psychologist
Malnutrition	**Target: Malnutrition**					
	Assessment of nutritional status	20	–	• Measuring tape • Scale weight	–	• Dietitian and nutritionist • Nursing professional • Specialist medical practitioner/ PRM physician
	Nutritional management	30	–	–	• Nutritional diary	• Dietitians and nutritionist • Nursing professional • Specialist medical practitioner/ PRM physician

PRM: physical and rehabilitation medicine.

Summary of the required material resources and workforce

Material resources

Assistive products (for prescription)	Equipment (for service facilities)	Consumables (for service facilities)
Products for self-care • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting **Products for mobility** • Orthoses, lower limb • Orthoses, spinal/cervical • Orthoses, upper limb • Therapeutic footwear • Cane/sticks/tetrapod • Crutches, axillary/elbow • Handrail/grab bars • Pressure cushion • Ramps, portable • Rollators • Walking frames/walkers • Wheelchairs, manual **Others** • Assistive products to adapt workstation	**Specific for assessment** • Goniometer • Handheld dynamometer • Heart rate monitor • Measuring tape • Scale weight **For interventions** • Utensils for activities of daily living • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting • Orthoses kit • Splinting kit (static/dynamic) • Treatment table • Exercise ball • Exercise mats • Resistance bands • Resistive exercise putty • Weights • Cycle ergometer (arm or leg) • Timer • Work-related tools and equipment	• Alcohol wipes • Antiseptic wipes • Gloves • Information materials (e.g. flyers, brochures) • Needles and syringe • Nutritional diary **Medicines** • Corticosteroids • Non-steroidal anti-inflammatory drugs (NSAIDs) • Oral antidepressants

NSAID: non-steroidal anti-inflammatory drug.

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation for rheumatoid arthritis (in alphabetical order)
• Dietitians and nutritionists • Nursing professionals • Occupational therapists • Physiotherapists • Prosthetists and orthotists • Psychologists • Social work and counselling professionals • Specialist medical practitioners/PRM physicians

PRM: physical and rehabilitation medicine.

3.3 Members of the working groups

The following experts have contributed to the development of the *Package of interventions for rehabilitation for rheumatoid arthritis* along the different development steps and using the listed clinical practice guidelines and Cochrane systematic reviews. See Annex 2 for a summary of declarations of interest.

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7. Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE). Geneva: World Health Organization; 2017 (https://apps.who.int/iris/handle/10665/258981, accessed December 2022).
8. mhGAP Intervention guide for mental, neurological and substance use disorders in non-specialized health settings: mental health GAP Action Programme (mhGAP) – version 2.0. Geneva; World Health Organization, 2016 (https://apps.who.int/iris/handle/10665/250239, accessed December 2022).
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4 Package of interventions for rehabilitation for sarcopenia

4.1 About sarcopenia

Sarcopenia is a progressive and generalized skeletal muscle condition involving the accelerated loss of muscle mass and function. It occurs commonly as an age-related process in older people, influenced not only by contemporaneous risk factors, but also by genetic and lifestyle factors operating across the life course. It can also occur in mid-life in association with a range of conditions *(1)*. Sarcopenia is considered "primary" (or age-related) when no other specific cause is evident. Sarcopenia is considered "secondary" when causal factors other than (or in addition to) ageing are evident, for example due to inflammatory processes, such as malignancy or organ failure *(2)*. There is an important correlation between inactivity and/or inadequate nutrition intake and losses of muscle mass and strength. Thus, physical activity and nutrition should be protective factors for both prevention and management of sarcopenia *(3)*.

As a consequence of the loss of muscle function, sarcopenia is associated with increased adverse outcomes including a loss of intrinsic capacity, frailty, falls, and mortality *(1)*. This reduced physical capacity may lead to reduced levels of functional ability, including reduced physical activity, limitations in performing activities of daily living and associated loss of independence, and restrictions in participating in meaningful life activities, such as community and social life. The reduced activity level may again contribute to the worsening of sarcopenia.

Reliable global estimates for the prevalence of sarcopenia are currently not available due to the lack of a single classification system used in epidemiological studies *(4)*. However, the overall prevalence of sarcopenia is estimated to be approximately 6–22% in adults aged 65 years and over, with a variation in prevalence across health-care settings and prevalence increasing with age *(5)*. The number of older adults with sarcopenia will continue to grow with the increase in ageing populations.

Role of rehabilitation in sarcopenia

Rehabilitation in sarcopenia is an essential service to prevent the deterioration of muscle functions, and consequently, to prevent the development of secondary conditions related to sarcopenia (e.g. fractures due to falls) but, as importantly, to achieve and maintain the optimal levels of functioning. Rehabilitation for sarcopenia is essential to people with the disease who have already suffered a secondary condition related to sarcopenia, such as a fall-related injury. Interventions for rehabilitation in sarcopenia address both the symptom (loss of muscle functioning itself), the consequences of (e.g. reduced physical activity, increased fall risk) and the risks (falls and injuries) related to the condition. In addition to interventions targeting the physical aspects, nutrition is an essential component in rehabilitation for people with sarcopenia.

Target population for the Package of interventions for rehabilitation for sarcopenia

This *Package of interventions of rehabilitation for sarcopenia* is intended to be used for adults with age-related sarcopenia at any level of severity (International Classification of Diseases, 11th revision (ICD-11): FB32.Y Other specified disorders of muscles).

Important links to other WHO products relevant for the care of people with sarcopenia:

- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (6).*

4.2 Content of the Package of interventions for rehabilitation for sarcopenia

Overview of the interventions for rehabilitation in sarcopenia

Functioning interventions

	Assessments[a]	Interventions[a]
Nutrition	Assessment of nutritional status[b]	Nutritional management (ensuring adequate protein intake)[b] (Protein supplementation)[c]
Motor functions and mobility	Assessment of muscle functions[b]	Muscle-strengthening exercises[b]
	Assessment of balance[b]	Balance training[b]
	Assessment of (gait pattern and) walking[b]	Provision and training in the use of assistive products for mobility[c]
Exercise and fitness	Assessment of exercise capacity[b]	Aerobic exercises[b]
Activities of daily living	Assessment of activities of daily living (ADL)[b]	ADL training[c]
		Provision and training in the use of assistive products for self-care[c]
		Modification of the home environment[c]
Lifestyle modification	Assessment of lifestyle risk factors[b]	Education, advice and support for healthy lifestyle[b]
Self-management		Education, advice, and support for self-management of the health condition[b]

[a] See Annex 1 for definitions of assessments and interventions.

[b] Adults with age-related sarcopenia with all severity levels.

[c] Adults with severe age-related sarcopenia.

Overview of the required resources for rehabilitation in sarcopenia

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Nutrition	**Target: Nutrition**					
	Assessment of nutritional status	20	–	• Scale weight (wheelchair accessible) • Measuring tape	–	• Dietitian and nutritionist • Specialist medical practitioner/ PRM physician
	Nutritional management (ensuring adequate protein intake)	30	–	–	• Protein supplements • Protein rich diet • Nutritional diary	• Dietitian and nutritionist • Specialist medical practitioner/ PRM physician
Motor functions and mobility	**Target: Muscles power functions**					
	Assessment of muscle functions	20	–	• Treatment table • Handheld dynamometer	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Muscle-strengthening exercises	20	–	• Treatment table • Weights • Resistance bands • Exercise mat • Resistive exercise putty	–	• Occupational therapist • Physiotherapist
	Target: Involuntary movement reaction functions (balance)					
	Assessment of balance	20	–	• Timer • Measuring tape	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Balance training	20	–	• Balance board/cushion • Exercise mat • Timer	–	• Occupational therapist • Physiotherapist
	Target: Walking					
	Assessment of (gait pattern) and walking	30	–	• Timer • Measuring tape	–	• Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
	Provision and training in the use of assistive products for mobility	30	• Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Wheelchairs, manual or electrical • Pressure cushion	–	–	• Occupational therapist • Physiotherapist
Exercise and fitness	**Target: Exercise tolerance functions**					
	Assessment of exercise capacity	30	–	• Timer • Cycle ergometer (arm or leg) • Heart rate monitor	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Aerobic exercises	30	–	• Timer • Cycle ergometer (arm or leg) • Heart rate monitor	–	• Physiotherapist
Activities of daily living	**Target: Activities of daily living (ADL)**					
	Assessment of ADL	30	–	• Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
	ADL training	30	–	• Utensils for activities of daily living • Assistive products for toileting • Assistive products for dressing	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of assistive products for self-care	30	• Assistive products for toileting • Assistive products for dressing	–	–	• Occupational therapist • Physiotherapist
	Modification of the home environment	60	• Handrail/grab bars • Ramps, portable	–	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Lifestyle modification	**Target: Healthy lifestyle**					
	Assessment of lifestyle risk factors	20	–	• Measuring tape • Scale weight	–	• Dietitian and nutritionist • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education, advice and support for healthy lifestyle	45	–	–	• Information materials (e.g. flyers, brochures)	• Dietitian and nutritionist • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
Self-management	**Target: Self-management**					
	Education, advice and support for self-management (incl. Education on nutrition, activities of daily living)	45	–	–	• Information materials (e.g. flyers, brochures)	• Occupational therapist • Peer counsellor • Physiotherapist • Specialist medical practitioner/ PRM physician

ADL: activity of daily living; PRM: physical and rehabilitation medicine.

Summary of the required material resources and workforce

Material resources

Assistive products (for prescription)	Equipment (for service facilities)	Consumables (for service facilities)
Products for self-care • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting **Products for mobility** • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Wheelchairs, manual or electrical • Pressure cushion • Handrail/grab bars • Ramps, portable	**Specific for assessment** • Hand grip dynamometer • Heart rate monitor • Measuring tape • Scale weight (wheelchair accessible) **For intervention** • Assistive products for toileting • Assistive products for dressing • Utensils for activities of daily living • Treatment table • Resistance bands • Resistive exercise putty • Weights • Exercise mats • Balance board/cushion • Cycle ergometer (arm or leg) • Timer	• Protein supplements • Protein rich diet • Nutritional diary • Information materials (e.g. flyers, brochures)

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation in sarcopenia (in alphabetical order)
• Dietitians and nutritionists • Occupational therapists • Physiotherapists • Psychologists • Specialist medical practitioners/PRM physicians

PRM: physical and rehabilitation medicine.

4.3 Members of the working groups

The following experts have contributed to the development of the *Package of interventions for rehabilitation for sarcopenia* along the different development steps and using the listed clinical practice guidelines and Cochrane systematic reviews. See Annex 2 for a summary of declarations of interest.

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5 Package of interventions for rehabilitation for fractures

5.1 About fractures

A bone fracture is described as the break in the continuity of a bone that can occur in any body part and at any age. The top three anatomical sites of fracture in terms of number of years lived with disability (YLDs) and age-standardized YLD rates are fracture of the lower limb (patella, tibia or fibula, or ankle); pelvis; and hip. The leading cause of disability due to fracture is falls *(1)*. In many cases, fractures are the result of a physical trauma (usually high force impact) or permanent stress (overuse); however fractures can also result from health conditions associated with a loss of bone strength (e.g. osteoporosis or cancer). With older age, bones weaken and the risk of fracture due to minimal trauma, such as falls, increases. A loss of bone strength, leading to increased fracture risk, may also occur in younger people with specific health conditions (e.g. juvenile osteoporosis). Bone healing depends on the severity of the fracture (e.g. closed or compound factures that have an increased risk for infection), the appropriate treatment of the fracture, and age and health condition of the person with the fracture. Typical symptoms of fractures are pain, swelling, bruising or bleeding (in open fractures) and the inability to move the affected area or put weight on it.

Given adequate treatment (alignment followed by immobilization with casts or braces, or surgical procedures), fractures can heal completely in most cases, although the healing may take weeks to months and requires restriction of the movement of the affected body part or the whole body. Depending on the severity of the fracture, appropriate treatment, potential complications (e.g. infections, delayed or non-union of the fracture), and the length of immobilization, muscle strength, joint and general mobility may decrease and the risk of developing secondary conditions (e.g. deep venous thromboembolism, pneumonia) and deterioration of general health increases.

Role of rehabilitation in fractures

It is estimated that in 2019, 436 million people worldwide were living with fractures and associated problems in functioning that could benefit from rehabilitation *(2)*. Rehabilitation is an essential health service to restore full or optimal functioning following fractures in people at all ages with any type of fracture. Rehabilitation should start immediately following acute treatment and continue until optimal functioning has been achieved. Interventions for rehabilitation support bone healing, prevent the deterioration of functioning, and help to prevent the development of secondary conditions. Rehabilitation helps to achieve and maintain optimal levels of functioning, and also to reduce the total time until full or optimal recovery.

Thus, rehabilitation is essential to support people with fractures to return to their daily life and meaningful activities, such as work and participation in community and social life, as quickly as possible.

Target population for the Package of interventions for rehabilitation for fractures

This *Package of interventions of rehabilitation for fractures* is intended to be used for people at any age with fractures in the upper or lower extremity (International Classification of Diseases, 11th revision (ICD-11): NC12 Fracture of shoulder or upper arm; NC32 Fracture of forearm; NC53 Fracture at wrist or hand level; NC72 Fracture of femur; NC92 Fracture of lower leg, including ankle; ND13 Fracture of foot, except ankle).

Important links to other WHO products relevant for the care of people with fractures:

- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (3).*
- *WHO Model List of Essential Medicines (4).*

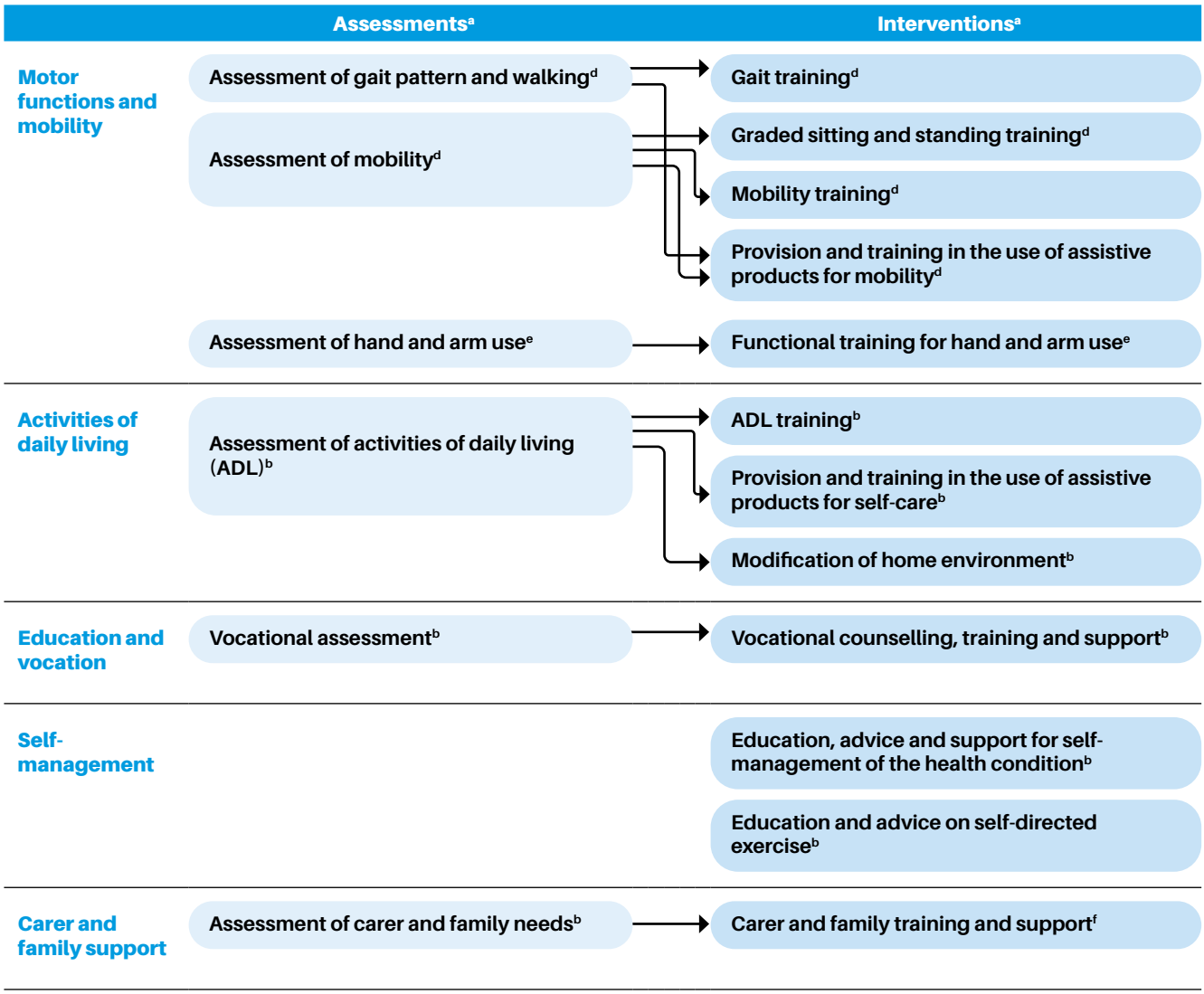
5.2 Content of the Package of interventions for rehabilitation for fractures

Overview of the interventions for rehabilitation in fractures

Functioning interventions

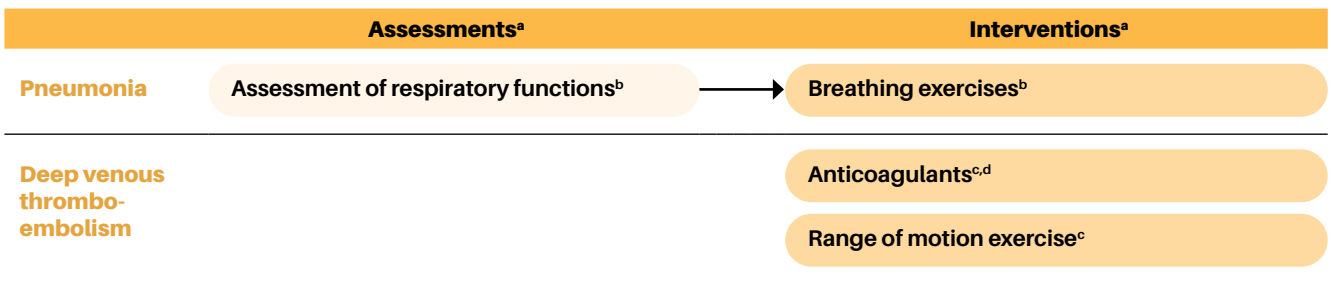
	Assessments[a]	Interventions[a]
Pain management	Assessment of pain[b]	Analgesics: Paracetamol[b,c] Thermotherapy[b] Provision and training in the use of orthoses[b]
Skin care	Assessment of skin[b]	Skin/wound care[b]
Cardiovascular functions	Assessment of oedema[b]	Range of motion exercises[b] Positioning for oedema control[b] Provision and training in the use of assistive products for compression therapy[b]
Motor functions and mobility	Assessment of structure of bones[b]	Weight-bearing exercises[b] Provision and training in the use of orthoses[b]
	Assessment of joint mobility[b]	Range of motion exercises[b] Stretching[b] Soft tissue techniques[b] Joint mobilization[b]
	Assessment of muscle functions[b]	Muscle-strengthening exercises[b]
	Assessment of balance[d]	Balance training[d]

[cont.]



[a] See Annex 1 for definitions of assessments and interventions.
[b] People with fractures in the upper and lower extremity.
[c] Medicines are included in WHO Model List of Essential Medicines *(4)*.
[d] People with fractures in the lower extremity.
[e] People with fractures in the upper extremity.
[f] Carers and family members of people with fractures.

Interventions for the prevention and treatment of secondary conditions related to fractures



[a] See Annex 1 for definitions of assessments and interventions.
[b] People with fractures who are bedridden.
[c] People with fractures in the lower extremity.
[d] Medicines are included in WHO Model List of Essential Medicines *(4)*.

Overview of the resources required for rehabilitation in fractures

Interventions for pain management

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Pain management	**Target: Sensation of pain**					
	Assessment of pain	30	–	–	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Analgesics	5	–	–	• Paracetamol • Oral NSAIDs	• Specialist medical practitioner/ PRM physician
	Thermotherapy	10	–	• Hot and cold packs • Towels	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of orthoses	60	• Orthoses, lower limb • Orthoses, upper limb	• Orthoses kit • Casting kit • Splinting kit (static/dynamic)	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
Skin care	**Target: Repair functions of the skin**					
	Assessment of skin	15	–	–	–	• Nursing professional • Occupational therapist • Physiotherapist
	Skin/wound care	15	–	–	• Moisturizing product • Barrier product • Cleansing product • Cleansing solutions with antimicrobials • Topical antiseptics • Wound dressings • Gloves	• Nursing professional • Specialist medical practitioner/ PRM physician

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Cardiovascular and immunological functions	**Target: Oedema control**					
	Assessment of oedema	10	–	• Measuring tape	–	• Nursing professional • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Range of motion exercises	15	–	• Treatment table	–	• Occupational therapist • Physiotherapist
	Positioning for oedema control	10	–	• Pillows • Foam rollers/wedges	–	• Nursing professional • Occupational therapist • Physiotherapist
	Provision and training in the use of products for compression therapy	15	• Products for compression therapy (garments, sockets, bandages)	–	–	• Nursing professional • Occupational therapist • Physiotherapist
Motor functions and mobility	**Target: Bone healing**					
	Assessment of structure of the bones	20	–	• General-purpose X-ray system, digital	–	• Specialist medical practitioner/ PRM physician
	Weight-bearing exercises	20	–	• Scale weight • Parallel bars • Crutches, axillary/elbow • Rollators • Walking frames/walkers	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of orthosis	60	• Orthoses, lower limb • Orthoses, upper limb • Tubular sock	• Orthoses kit • Casting kit • Splinting kit (static/dynamic)	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
	Target: Mobility of joint functions					
	Assessment of joint mobility	10	–	• Treatment table • Goniometer • Measuring tape	–	• Occupational therapist • Physiotherapist
	Range of motion exercises	15	–	• Treatment table	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	**Stretching**	15	–	• Treatment table • Exercise mat	–	• Occupational therapist • Physiotherapist
	Soft tissue techniques	15	–	• Treatment table • Pillow • Foam rollers /wedges	• Massage lotion	• Occupational therapist • Physiotherapist
	Joint mobilization	15	–	• Treatment table • Stabilization/mobilization belts • Pillows • Towels	–	• Occupational therapist • Physiotherapist
	Target: Muscle power functions					
	Assessment of muscle functions	20	–	• Treatment table • Handheld dynamometer	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Muscle-strengthening exercises	20	–	• Treatment table • Weights • Resistance bands • Exercise mat • Resistive exercise putty	–	• Occupational therapist • Physiotherapist
	Target: Involuntary movement reaction functions (balance)					
	Assessment of balance	20	–	• Timer • Measuring tape	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Balance training	20	–	• Scale weight • Parallel bars • Balance board/cushion • Exercise mats • Timer	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	**Target: Gait pattern functions and walking**					
	Assessment of gait and walking	30	–	• Timer • Measuring tape • Parallel bars	–	• Physiotherapist
	Gait training	30	–	• Scale weight • Parallel bars • Training stairs • Mobile mirror • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers	–	• Physiotherapist
	Target: Mobility					
	Assessment of mobility	30	–	• Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers	–	• Occupational therapist • Physiotherapist
	Graded sitting and standing training	15	–	• Blood pressure measurement device • Crutches, axillary/elbow • Rollators • Walking frames/walkers	–	• Nursing professional • Occupational therapist • Physiotherapist
	Mobility training	30	–	• Exercise mat • Ramps (temporary/mobile) • Steps (stackable) • Stools/small benches of varying height • Training stairs • Transfer boards/slide sheet	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of assistive products for mobility	30	• Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Wheelchairs, manual • Pressure cushion	• Measuring tape	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
	Target: Hand and arm use					
	Assessment of hand and arm use	20	–	• Upper limb workstation • Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
	Functional training for hand and arm use	20	–	• Upper limb workstation • Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
Activities of daily living	**Target: Activities of daily living (ADL)**					
	Assessment of ADL	30	–	• Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
	ADL training	30	–	• Utensils for activities of daily living • Assistive products for dressing • Assistive products for toileting • Adapted eating and drinking products	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of assistive products for self-care	30	• Assistive products for dressing • Assistive products for toileting • Adapted eating and drinking products	–	–	• Occupational therapist • Physiotherapist
	Modification of the home environment	60	• Handrail/grab bars • Ramps, portable	• Measuring tape	–	• Occupational therapist • Physiotherapist
Education and vocation	**Target: Work and employment**					
	Vocational assessment	90	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Vocational counselling, training, and support	60	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Self-management	**Target: Self-management**					
	Education, advice and support for self-management of the health condition	45	–	–	• Information materials (e.g. flyers, brochures)	• Nursing professional • Occupational therapist • Peer counsellor • Physiotherapist • Specialist medical practitioner/ PRM physician
	Education and advice on self-directed exercises	45	–	–	• Information materials (e.g. flyers, brochures)	• Occupational therapist • Physiotherapist
Carer and family support	**Target: Carer and family support**					
	Assessment of carer and family needs	30	–	–	–	• Nursing professional • Occupational therapist • Psychologist • Social work and counselling professional
	Carer and family training and support	45	–	–	• Information materials (e.g. flyers, brochures)	• Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Social work and counselling professional

ADL: activity of daily living; NSAID: non-steroidal anti-inflammatory drug; PRM: physical and rehabilitation medicine.

Interventions for the prevention and treatment of secondary conditions related to fractures

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Pneumonia	**Target: Pneumonia**					
	Assessment of respiratory functions	30	–	• Pulse oximeter • Stethoscope	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Breathing exercises	15	–	• Inspiratory and expiratory training devices	• Straws	• Nursing professional • Physiotherapist
Deep venous thromboembolism	**Target: Deep venous thromboembolism**					
	Anticoagulants	5	–	–	• Anticoagulants • Needles and syringe • Alcohol wipes • Gloves	• Specialist medical practitioner/ PRM physician
	Range of motion exercises	15	–	• Treatment table	–	• Occupational therapist • Physiotherapist

PRM: physical and rehabilitation medicine.

Summary of the required material resources and workforce

Material resources

Assistive products (for prescription)	Equipment (for service facilities)	Consumables (for service facilities)
Products for self-care • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting • Products for compression therapy (garments, sockets, bandages) **Products for mobility** • Orthoses, lower limb • Orthoses, upper limb • Tubular sock • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Wheelchairs, manual • Pressure cushion • Handrail/grab bars • Ramps, portable	**Specific for assessment** • Blood pressure measurement device • General-purpose X-ray system, digital • Goniometer • Handheld dynamometer • Measuring tape • Pulse oximeter • Scale weight • Stethoscope **For intervention** • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting • Utensils for activities of daily living • Foam rollers/wedges • Pillows • Inspiratory and expiratory training devices • Hot and cold packs • Towels • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Casting kit • Orthoses kit • Splinting kit (static/dynamic) • Treatment table • Stabilization/mobilization belts • Resistance bands • Resistive exercise putty • Weights • Exercise mat • Balance board/cushion • Training stairs • Ramps (temporary/mobile) • Steps (stackable) • Stools/small benches of varying height • Transfer boards/slide sheet • Parallel bars • Mobile mirror • Timer • Upper limb workstation • Work-related tools and equipment	• Alcohol wipes • Cleansing product • Cleansing solutions • Barrier product • Moisturizing product with antimicrobials • Gloves • Information materials (e.g. flyers, brochures) • Massage lotion • Needles and syringe • Straws • Topical antiseptics • Wound dressings **Medicines** • Anticoagulants • Oral NSAIDs • Paracetamol

NSAID: non-steroidal anti-inflammatory drug.

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation for fractures (in alphabetical order)

- Nursing professionals
- Occupational therapists
- Physiotherapists
- Psychologists
- Social work and counselling professionals
- Specialist medical practitioners/PRM physicians

PRM: physical and rehabilitation medicine.

5.3 Members of the working groups

The following experts have contributed to the development of the *Package of interventions for rehabilitation for fractures* along the different development steps and using the listed clinical practice guidelines and Cochrane systematic reviews. See Annex 2 for a summary of declarations of interest.

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3. Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE). Geneva: World Health Organization; 2017 (https://apps.who.int/iris/handle/10665/258981, accessed December 2022).
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6 Package of interventions for rehabilitation for amputation

6.1 About amputation

An amputation is described as the removal of a limb or any other body part because of a trauma (injury or accident), or a surgery due to causes, such as cancer, diabetes, infection or pain. Any type of amputation requires surgical approaches either to care for the wounds related to a traumatic amputation or to perform the surgical amputation itself. The symptoms following an amputation are diverse and range from physical impairments, phantom limb sensations and phantom limb pain to specific symptoms related to the amputation that can cause severe distress.

Location (lower limb or upper limb), size of the removed body part (partial or complete), and quality of the surgery, all significantly impact the extent of limitations in functioning related to the amputation. In addition, continuing pain, phantom limb phenomena and psychological issues can impact the extent of the limitations and cause complications and delay during the recovery process. The lack of a (part of) limb, in particular the lower limb, also often contributes to increased fall risk. Thus, the loss of a limb causes a permanent disability that can impact a person's self-image, their capacity to perform self-care, and to move around. The ability to become or remain independent and to participate in meaningful activities such as education and vocation or social life is often limited. Furthermore, people with amputation often experience stigmatization and social exclusion.

Role of rehabilitation in amputation

It is estimated that in 2019, 176 million people worldwide were living with an amputation and associated problems in functioning that could benefit from rehabilitation *(1)*. Rehabilitation is an essential health service in people following an amputation at all ages to achieve and maintain optimal functioning, independent from the location of the amputation. To achieve optimal outcomes, rehabilitation should start in the acute phase and continue until optimal functioning has been achieved. The preparation for, selection, fitting and training in the use of prosthesis is a core component in rehabilitation for people with amputation, more commonly for those with lower limb amputation. Thus, interventions for rehabilitation target improving the motor functions as well as helping to prevent the development of secondary conditions related to an amputation. Importantly, rehabilitation includes psychosocial care and comprises a wide range of interventions that support people following amputation to return to their daily life and meaningful activities, such as school, work and participation in community and social life, as quickly as possible.

Target population for the Package of interventions for rehabilitation for amputation

This *Package of interventions of rehabilitation for amputation* is intended to be used for people at any age with traumatic or surgical upper or lower limb amputation (International Classification of Diseases, 11th revision (ICD-11): NC18 Traumatic amputation of shoulder or upper arm; NC38 Traumatic amputation of forearm; NC59 Traumatic amputation of wrist or hand; NC78 Traumatic amputation of hip or thigh; NC98 Traumatic amputation of lower leg; NC19 Traumatic amputation of ankle or foot; QF00 Acquired absence of limb).

Important links to other WHO products relevant for the care of people with amputation:

- *WHO standards for prosthetics and orthotics (2).*
- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (3).*
- *mhGAP Intervention guide for mental, neurological and substance use disorders in non-specialized health settings: mental health GAP Action Programme (mhGAP) – version 2.0 (4).*
- *WHO Model List of Essential Medicines (5).*

6.2 Content of the Package of interventions for rehabilitation for amputation

Overview of the interventions for rehabilitation in amputation

Functioning interventions

	Assessments[a]	Interventions[a]
Cognitive functions	Assessment of body image[b]	Cognitive behavioural therapy[b]
Pain management	Assessment of pain[b]	Amitriptyline[b,c] Cognitive behavioural therapy[b]
Skin care	Assessment of the skin[b]	Skin/wound care[b] Rigid dressing[d]
Cardiovascular functions	Assessment of vascular functions[b]	
	Assessment of oedema[b]	Range of motion exercises[d] Positioning for oedema control[b] Rigid dressing[d] Provision and training in the use of products for compression therapy[b]

[cont.]

	Assessments[a]	Interventions[a]
Motor functions and mobility	Assessment of joint mobility[b]	Range of motion exercises[b]
		Stretching[b]
	Assessment of muscle functions[b]	Muscle-strengthening exercises[b]
	Assessment of balance[b]	Balance training[b]
	Assessment of gait pattern and walking[d]	Gait training[d]
		Provision and training in the use of lower limb prosthesis[d]
	Assessment of mobility[b]	Mobility training[b]
		Provision and training in the use of assistive products for mobility[d]
		Provision and training in the use of upper limb prosthesis[e]
Exercise and fitness	Assessment of exercise capacity[b]	Fitness training[b]
Activities of daily living	Assessment of activities of daily living (ADL)[b]	ADL training[b]
		Provision and training in the use of assistive products for self-care[b]
		Modification of the home environment[b]
Interpersonal interactions and relationships	Assessment of interpersonal interactions and relationships[b]	Peer support[b]
Education and vocation	Educational assessment[f]	Educational counselling, training and support[f]
		Modification of the school environment[f]
	Vocational assessment[g]	Vocational counselling, training, and support[g]
		Modification of the workplace environment[g]

[cont.]

	Assessments[a]	Interventions[a]
Community and social life	Assessment of participation in community and social life[b]	Participation focused interventions[b] Provision and training in the use of assistive products for sports and recreation[b]
Lifestyle modification	Assessment of lifestyle risk factors[b]	Education, advice and support for healthy lifestyle[b]
Self-management		Education, advice and support for self-management of the health condition[b]
Carer and family support	Assessment of carer and family needs[h]	Carer and family training and support[h]

[a] See Annex 1 for definitions of assessments and interventions.
[b] People (any age) with upper or lower limb amputation.
[c] Medicine is included in WHO Model List of Essential Medicines *(5)* for another indication.
[d] People (any age) with lower limb amputation.
[e] People (any age) with upper limb amputation.
[f] Children/adolescents with upper or lower limb amputation.
[g] Adolescents/adults with upper or lower limb amputation.
[h] Carers and family members of people with upper or lower limb amputation.

Interventions for the prevention and treatment of secondary conditions related to amputation

	Assessments[a]	Interventions[a]
Mental health (depression, anxiety, emotional distress)	Assessment of mental health[b]	Antidepressants[c,d] Psychological therapies[b] Physical exercise training[b] Stress management training[b]

[a] See Annex 1 for definitions of assessments and interventions.
[b] People (any age) with upper or lower limb amputation.
[c] Adults with upper or lower limb amputation, with moderate to severe depression.
[d] Medicines are included in WHO Model List of Essential Medicines *(5)*.

Overview of the resources required for rehabilitation in amputation

Functioning interventions

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental/cognitive functions	**Target: Experience of self and time (body image)**					
	Assessment of body image	20	–	–	–	• Psychologist • Specialist medical practitioner/ PRM physician
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
Pain management	**Target: Sensation of pain**					
	Assessment of pain	30	–	–	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Analgesics	5	–	–	• Amitriptyline	• Specialist medical practitioner/ PRM physician
	Cognitive behavioural therapy	60	–	–	–	• Psychologist
Skin care	**Target: Structure of the skin**					
	Assessment of the skin	10	–	–	–	• Nursing professional • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Skin care	**Target: Repair functions of the skin**					
	Skin/wound care	15	–	–	• Moisturizing product • Barrier product • Cleansing product • Cleansing solutions with antimicrobials • Topical antiseptics • Wound dressings • Gloves	• Nursing professional • Specialist medical practitioner/ PRM physician
	Rigid dressing	30	–	• Castings kit	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
Cardiovascular functions	**Target: Blood vessel functions**					
	Assessment of vascular functions	30	–	• Ultrasound scanner	• Gel	• Specialist medical practitioner/ PRM physician
	Target: Oedema control					
	Assessment of oedema	10	–	• Measuring tape	–	• Nursing professional • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Range of motion exercises	15	–	• Treatment table	–	• Occupational therapist • Physiotherapist
	Positioning for oedema control	10	–	• Pillows • Foam rollers/wedges	–	• Occupational therapist • Physiotherapist
	Rigid dressing	30	–	• Castings kit	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
	Provision and training in the use of assistive products for compression therapy	15	• Products for compression • therapy (garments, stockings, • bandages)	–	–	• Nursing professional • Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	**Target: Mobility of joint functions**					
	Assessment of joint mobility	10	–	• Treatment table • Goniometer • Measuring tape	–	• Occupational therapist • Physiotherapist
	Range of motion exercises	15	–	• Treatment table	–	• Occupational therapist • Physiotherapist
	Stretching	15	–	• Treatment table • Exercise mats	–	• Occupational therapist • Physiotherapist
	Target: Muscle power functions					
	Assessment of muscle functions	20	–	• Treatment table • Handheld dynamometer	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Muscle-strengthening exercises	20	–	• Treatment table • Weights • Resistance bands • Exercise mats	–	• Occupational therapist • Physiotherapist
	Target: Involuntary movement reaction functions (balance)					
	Assessment of balance	20	–	• Timer • Measuring tape	–	• Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Balance training	20	–	• Parallel bars • Balance board/cushion • Exercise mat • Timer • Standing frames, adjustable	–	• Occupational therapist • Physiotherapist
	Target: Gait pattern functions and walking					
	Assessment of gait pattern and walking	30	–	• Timer • Measuring tape • Parallel bars	–	• Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	**Gait training**	30	–	• Parallel bars • Training stairs • Mobile mirror • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers	–	• Physiotherapist
	Provision and training in the use of lower limb prosthesis	60	• Prostheses, lower limb • Early walking aids (EWAs)	• Prosthetic kit	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist
	Target: Mobility					
	Assessment of mobility	30	–	• Transfer boards/slide sheet • Ramps (temporary/mobile) • Timer	–	• Occupational therapist • Physiotherapist
	Mobility training (incl. falls training)	30	–	• Exercise mat • Cones • Ramps (temporary/mobile) • Steps (stackable) • Stools/small benches of varying height • Training stairs • Transfer boards/slide sheet	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of assistive products for mobility	30	• Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Wheelchairs, manual • Pressure cushion • Stump board	• Measuring tape	–	• Occupational therapist • Physiotherapist
	Target: Hand and arm use					
	Provision and training in the use of upper limb prosthesis	60	• Prostheses, upper limb	• Prosthetic kit	–	• Occupational therapist • Physiotherapist • Prosthetist and orthotist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Exercise and fitness	**Target: Exercise tolerance functions**					
	Assessment of exercise capacity	30	–	• Timer • Cycle ergometer (arm or leg) • Heart rate monitor	–	• Physiotherapist • Specialist medical practitioner/ PRM physician
	Fitness training	30	–	• Cycle ergometer (arm or leg) • Exercise mat • Resistance bands • Weights • Exercise ball • Timer	–	• Physiotherapist
Activities of daily living	**Target: Activities of daily living (ADL)**					
	Assessment of ADL	30	–	• Utensils for activities of daily living	–	• Occupational therapist • Physiotherapist
	ADL training	30	–	• Utensils for activities of daily living • Assistive products for toileting • Adapted eating and drinking products • Assistive products for dressing	–	• Occupational therapist • Physiotherapist
	Provision and training in the use of assistive products for self-care	30	• Assistive products for toileting • Adapted eating and drinking products • Assistive products for dressing	–	–	• Occupational therapist • Physiotherapist
	Modification of the home environment	60	• Hand rail/grab bars • Ramps, portable	• Measuring tape	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Interpersonal interactions and relationships	**Target: Interpersonal interactions and relationships**					
	Assessment of interpersonal interactions and relationships	30	–	–	–	• Occupational therapist • Psychologist
	Peer support	45	–	–	–	• Peer counsellor
Education and vocation	**Target: Education**					
	Educational assessment	60	–	• School-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Educational counselling, training and support	60	–	• School-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Modification of the school environment	60	• Ramps, portable	• Measuring tape	–	• Occupational therapist • Physiotherapist
	Target: Work and employment					
	Vocational assessment	90	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Vocational counselling, training and support	60	–	• Work-related tools and equipment	–	• Occupational therapist • Social work and counselling professional
	Modification of the workplace environment	60	• Ramps, portable	• Measuring tape	–	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Community and social life	**Target: Community and social life**					
	Assessment of participation in community and social life	20	–	–	–	• Occupational therapist • Social work and counselling professional
	Participation focused Interventions	60	–	• Equipment for sport and recreational and leisure activities	–	• Occupational therapist • Physiotherapist • Social work and counselling professional
	Provision and training in the use of assistive products for recreation and leisure	30	• Assistive products for sport and leisure activities	–	–	• Occupational therapist • Physiotherapist
Self-management	**Target: Self-management**					
	Education, advice and support for self-management	45	–	–	–	• Nursing professional • Occupational therapist • Peer counsellor • Physiotherapist • Specialist medical practitioner/ PRM physician

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Lifestyle modification	**Target: Healthy lifestyle**					
	Assessment of lifestyle risk factors	20	–	• Measuring tape • Scale weight	–	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education, advice and support for healthy lifestyle	45	–	–	• Information materials (e.g. flyers, brochures)	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
Carer and family support	**Target: Carer and family support**					
	Assessment of carer and family needs	30	–	–	–	• Nursing professional • Occupational therapist • Psychologist • Social work and counselling professional
	Carer and family training and support	45	–	–	• Information materials (e.g. flyers, brochures)	• Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Social work and counselling professional

ADL: activity of daily living; PRM: physical and rehabilitation medicine.

Interventions for the prevention and treatment of secondary conditions related to amputation

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental health	Target: Mental health (in particular depression, anxiety, emotional distress)					
	Assessment of mental health	60	–	–	–	• Psychologist • Specialist medical practitioner/ PRM physician
	Antidepressants	5	–	–	• Oral antidepressants	• Specialist medical practitioner/ PRM physician
	Psychological therapies (incl. cognitive behavioural therapy)	60	–	–	–	• Psychologist
	Physical exercise training	30	–	• Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg)	–	• Physiotherapist
	Stress management training	30	–	–	–	• Psychologist

PRM: physical and rehabilitation medicine.

Summary of the required material resources and workforce

Material resources

Assistive products (for prescription)	Equipment (for service facilities)	Consumables (for service facilities)
Products for self-care • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting • Products for compression • therapy (garments, stockings, • bandages) • **Products for mobility** • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Walking frames/walkers • Wheelchairs, manual • Stump board • Pressure cushion • Early walking aids (EWAs) • Prostheses, lower limb • Prostheses, upper limb • Handrail/grab bars • Ramps, portable **Others** • Assistive products for sport and leisure activities	**Specific for assessment** • Goniometer • Handheld dynamometer • Heart rate monitor • Measuring tape • Ultrasound scanner **For interventions** • Adapted eating and drinking products • Assistive products for dressing • Assistive products for toileting • Utensils for activities of daily living • Canes/sticks/tetrapod • Crutches, axillary/elbow • Rollators • Standing frames, adjustable • Walking frames/walkers • Castings kit • Prosthetic kit • Treatment table • Foam rollers/wedges • Pillows • Stools/small benches of varying height • Transfer boards/slide sheet • Balance board/cushion • Resistance bands • Weights • Exercise mats • Exercise ball • Steps (stackable) • Training stairs • Parallel bars • Ramps (temporary/mobile) • (Mobile) mirror • Cycle ergometer (arm or leg) • Timer • Scale weight • School-related tools and equipment • Work-related tools and equipment • Equipment for sport and recreational and leisure activities	• Alcohol wipes • Barrier product • Cleansing product • Cleansing solutions with antimicrobials • Dressings • Gel • Gloves • Information materials (e.g. flyers, brochures) • Medical tape • Moisturizing product • Wound dressings **Medicines** • Amitriptyline • Topical antiseptics • Oral antidepressants

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation for amputation (in alphabetical order)

- Dietitians and nutritionists
- Nursing professionals
- Occupational therapists
- Physiotherapists
- Prosthetists and orthotists
- Psychologists
- Social work and counselling professionals
- Specialist medical practitioners/PRM physicians

PRM: physical and rehabilitation medicine.

6.3 Members of the working groups

The following experts have contributed to the development of the *Package of interventions for rehabilitation for amputation* along the different development steps. See Annex 2 for a summary of declarations of interest.

Members of the technical working group

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Members of the development group

Jonathan BATZDORFF (Prosthetist and orthotist, USA); Ana P CHAIVIRA-MENDOZA (Consumer representative, Mexico); Sabine CICCONE (Physiotherapist, Germany); Mariette DEIST (Prosthetist and orthotist, South Africa); Deirdre DESMOND (Psychologist, Ireland); Charne FERIS (Occupational therapist, Namibia); Kerstin HAGBERG (Physiotherapist, Sweden); Rajiv HANSPAL (PRM physician, United Kingdom); Carlotte KIEKENS (PRM physician, Belgium); Tsitsi MUROVE (Occupational therapist, Zimbabwe); Man Sang WONG (Prosthetist and orthotist, Hong Kong SAR, China); Jay Narayan YADAV (Physiotherapist, Nepal).

Members of the peer review group

Yusuph ABIODUN ODEYOYIN (Occupational therapist, Nigeria); Noor Jahan AKHTAR (Physiotherapist, Bangladesh); Firoz ALIZADA (Consumer representative, Afghanistan); Raed ALKHATTAB (Biomedical engineer and CPO, Jordan); Ajediran BELLO (Physiotherapist, Ghana); Laura BLAKE (Physiotherapist, Switzerland/Australia); Helena BURGER (PRM physician, Slovenia); Yatma FALL (Consumer representative, Senegal); Ritu GHOSH (Prosthetist and orthotist, India); Claudine HUMURE (Amputee, Rwanda); Cody McDONALD (Prosthetist and orthotist, USA); Saffran MÖLLER (Physiotherapist, Sweden); Pooja MUKUL (PRM physician; India); Peter NDAA (Occupational therapist, Ghana); Nehad NEGATU (Physiotherapist, Sudan); Md Mahfuzur RAHMAN (Occupational therapist, Bangladesh); Reynaldo REY-MATIAS (PRM physician, Philippines); Tahmineh REZAEIAN (Prosthetist and orthotist, Islamic Republic of Iran); Carolina SCHIAPPACASSE (PRM physician, Argentina); Lea STUDER (Physiotherapist, Switzerland); John Paul SULLIVAN (Prosthetist and orthotist, United Kingdom); Nils-Odd TØNNEVOLD (Consumer representative; Norway); Stephen WEGENER (Rehabilitation psychologist, USA).

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Annex 1. Glossary of assessments and interventions

For each assessment and intervention included in the *Package of interventions for rehabilitation*, short descriptions are provided to help understand each specific action.

A1.1 Assessments

Assessment	Description of the assessment
Assessment of gait pattern functions and walking	Walking is the ability to move along different surfaces for short or long distances and at different speeds. Unrestricted and safe walking requires, among other factors, an intact gait pattern, which describes the specific sequences of limb and joint movements during walking. The assessment of gait pattern and walking (including initial screening to determine the need for comprehensive assessment) uses observational gait analysis and the measurement of walking speed and walking distance to determine the presence and/or severity of limitations in gait and walking, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of activities of daily living	Activities of daily living (ADL) are tasks regularly performed as part of self-care activities (e.g. washing, caring for body parts, toileting, dressing, eating and drinking and looking after one's health), or instrumental activities (e.g. household tasks, acquisition of goods and services, and managing communication, relationships and finances). The assessment of ADL (including initial screening to determine the need for comprehensive assessment) uses interviewing, observation and standardized self-reported questionnaires to determine the presence and/or severity of the limitations in ADL, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of balance	For balance or postural control, sensory (vestibular, somatosensory and visual) information is processed to inform a muscular response that allows maintenance of a body position. The assessment of balance (including initial screening to determine the need for comprehensive assessment) uses observation and standardized balance tests to determine the presence and/or severity of impairments in balance and related fall risk, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of body image	Body image refers to the mental function related to the representation and awareness of one's body. Impairments include phantom limb sensation or feeling too fat or too thin, for example. Assessment of body image (including initial screening to determine the need for comprehensive assessment) uses interviewing, observation and standardized self-reported questionnaires to determine the presence and/or severity of problems with body image perception, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of carer and family needs	The role of carer often presents a huge burden that may result in overstrain and health issues. The assessment of carer and family needs uses interviewing and standardized self-reported questionnaires to determine the physical, mental and emotional needs, and the person's knowledge and skills to provide care. It also assesses the need for a referral to comprehensive assessment and treatment if required.

Assessment	Description of the assessment
Assessment of content of thought	Content of thought refers to the ideas present in the thinking process and what is being conceptualized. Catastrophizing, fear-avoidance beliefs and kinesiophobia are examples related to the content of thought. This is described as inappropriate cognitive-affective response to an anticipated or actual event or perception (e.g. pain) and impacts an individual's behaviour (e.g. avoiding movement for risk of pain). Assessment of content of thought (including initial screening to determine the need for comprehensive assessment) uses interviewing and standardized self-reported questionnaires to determine the presence and/or severity of inappropriate content of thought, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of oedema	Oedema (e.g. peripheral or lymphoedema) describes an abnormal fluid volume in the circulatory system or in the interstitial space. The assessment of oedema (including initial screening to determine the need for comprehensive assessment) uses a physical examination (including inspection, palpation, circumference measurements) to determine the presence and/or severity of oedema, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of exercise capacity	Exercise capacity is the ability to increase oxygen uptake above that at rest. Exercise tolerance relates to an individual's exercise capacity to endure exercise or to achieve a maximum workload. The assessment of exercise capacity (including initial screening to determine the need for comprehensive assessment) uses self-reported questionnaires and rating scales and standardized maximal exercise tests (e.g. walking, ergometer or treadmill testing) to determine the presence and/or severity of reduced exercise capacity, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of fatigue	Fatigue describes extreme and prolonged feeling of tiredness, triggered by physical or mental activities, which extend beyond normal tiredness. Fatigue often relates to the experience of stress, sleep disturbances, use of medication, or physical or mental disorders. The assessment of fatigue (including initial screening to determine the need for comprehensive assessment) uses interviewing, standardized self-reported questionnaires and rating scales to determine the presence and/or severity of fatigue, ascertain its impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of hand and arm use	Hand and arm use comprises several specific activities, such as lifting, carrying, moving or manipulating objects, which require intact fine and gross motor functions. For the assessment of hand and arm use, activities most relevant for the individual are selected. The assessment of hand and arm use (including initial screening to determine the need for comprehensive assessment) uses interviewing, observation and standardized tests to determine the presence and/or severity of limitations in hand and arm use, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of interpersonal interactions and relationships	Maintaining basic and complex interpersonal interactions and relationships depends on the level of physical and mental functioning, social skills and specific situation of the individual and the people who relate to the individual. The assessment (including initial screening) can be conducted by observation, interviewing or using standardized self-reported questionnaires.
Assessment of joint mobility	Joint mobility is the range through which a joint can be moved actively or passively. Joint mobility is determined by motor functions, structures of the joint and flexibility of soft tissue. The assessment of joint mobility (including initial screening to determine the need for comprehensive assessment) uses observation and standardized measurements using equipment (e.g. goniometer, inclinometer, tape measures) to determine the presence and/or severity of impairments in joint mobility, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of lifestyle risk factors	Lifestyle risk factors relate to health behaviours that are associated with an increased risk of morbidity and mortality (tobacco use, excessive intake of alcohol, physical inactivity and unhealthy nutrition). The assessment of lifestyle risk factors (including initial screening to determine the need for comprehensive assessment) uses interviewing and standardized self-reported questionnaires to determine the health risks related to lifestyle, ascertain their impact on health and functioning, and inform care planning, including the need for referral or follow-up.

Assessment	Description of the assessment
Assessment of mental health	Mental health has intrinsic and instrumental value, helping people to connect (e.g. having positive relationships, sense of belonging), function (e.g. applying cognitive skills, learn new skills), cope (e.g. deal with stress, understanding and managing emotions) and thrive (e.g. feeling good, finding purpose in life). The assessment of mental health (using initial screening to determine the need for comprehensive assessment) uses interviewing and standardized self-reported questionnaires to determine the presence and/or severity of psychosocial health issues, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of mobility	Mobility comprises several activities, such as transferring, or changing body position, and moving around indoors and outdoors either by walking, with the help of an assistive product (e.g. a wheelchair), or using different means of transportation. Thus, for the assessment (including initial screening) of mobility, the activities most relevant for the individual are selected. The assessment of mobility (including initial screening to determine the need for comprehensive assessment) uses interviewing, observation and standardized tests to determine the presence and/or severity of limitations in mobility and related fall risk, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of muscle functions	Muscle function refers to the force (maximal force = strength, force x velocity = power) generated by the contraction of a muscle or muscle groups. The assessment of the function of specific muscles or muscle groups (including initial screening to determine the need for comprehensive assessment) uses standardized tests either with the use of equipment (e.g. handheld dynamometry, isokinetic devices), or without (e.g. manual muscle testing), to determine the presence and/or severity of muscle weakness, ascertain its impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of nutritional status	Nutritional status describes the state of the body in relation to the consumption and utilization of nutrients and can be classified as well-nourished or malnourished (under- or over-nourished). The assessment of nutritional status uses anthropometric measures to assess body composition (measurement of weight, height, body mass index, body circumferences and skinfold thickness), laboratory tests to assess biochemical parameters, clinical assessment of comorbid conditions and interviewing to assess dietary practices. Assessment aims to ascertain the impact of the nutritional status on health and functioning, and inform care planning, including the need for referral or follow-up.
Assessment of pain	Pain is an unpleasant sensory or emotional experience associated with, or resembling that associated with, actual or potential tissue damage. Pain can be differentiated into nociceptive or neuropathic pain (including phantom limb pain) and into acute (short-term) or chronic (longer than 3 months) pain. The experience of pain often relates to specific physical activities as well as to psychological factors. The assessment of pain (including initial screening to determine the need for comprehensive assessment) needs to integrate a biopsychosocial perspective, including the assessment of the location, nature and intensity of pain, aggravating and easing factors, pain-related coping, and interference with activities and social determinants. The assessment of pain uses interviewing, standardized self-reported questionnaires, rating scales and physical examination (e.g. pain provoking tests) to determine the presence and/or severity of pain, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of participation in community and social life	Community and social life performance refers to the person's level of participation in various social and community life activities (e.g. sport, recreation and leisure, religion and spirituality, or political life). The assessment of participation in community and social life uses interviewing and standardized self-reported questionnaires to determine the presence and/or severity of restrictions in participation and inform care planning, including the need for referral or follow-up.

Assessment	Description of the assessment
Assessment of respiratory functions	Respiratory functions comprise inhaling air into the lungs, exchanging gases between air and blood, and exhaling air. Respiration rate, rhythm and depth determine oxygen uptake and output. The assessment of respiratory functions (including initial screening to determine the need for comprehensive assessment) uses physical examination (including observation, measurement of respiration rate and rhythm) and lung function tests (e.g. spirometry) to determine the presence and/or severity of impairments in respiratory functions, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of structure of the bones	The integrity of a bone is determined by its continuity, density and regular form. Bone healing takes place in successive steps with different stability of the bone along the process. Insufficient bone healing may result in pseudarthroses or bone deformity. Bone density relates to appropriate loading of the bone, nutrition and diseases. Assessment of the structure of bone uses imaging procedures to determine the presence and/or severity of impairments of the bone, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of the skin	The integrity of the skin is determined by its intact surface and the capacity to heal if wounds occur. Poor skin integrity increases the risk for pressure ulcers or infections and poor wound healing. The assessment of the skin (including initial screening to determine the need for comprehensive assessment) generally uses physical examination (including observation and palpation) to determine the presence and/or severity of impairments in the structure of the skin. Additionally, it includes the identification of risks for skin damage. The assessments of the skin and the risk for skin damage ascertain impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of vascular functions	Blood vessels have the function of transporting blood throughout the body to deliver and absorb oxygen, nutrients and other substances. Reduced blood flow may increase the risk for undersupply of organs and can result in symptoms such as pain during exertion or at rest, numbness or tingling, and pale or cool skin. Increased blood flow can cause symptoms such as swelling, redness and warmth. The assessment of vascular functions (including initial screening to determine the need for comprehensive assessment) uses interviewing and physical examination (including inspection, palpation, vascular tests) and imaging to determine the presence and/or severity of impairments in vascular functions, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Educational assessment	Educational assessment aims to describe a person's capacity to participate in educational activities (school readiness, skills and competencies related to learning and applying knowledge) and/or a person's performance at school or university. During the educational assessment, information is collected on the individual's capacity and/or performance to complete expected or assigned tasks, organize themselves, work cooperatively with classmates, and take directions from teachers. The educational assessment (including initial screening to determine the need for comprehensive assessment) uses interviewing, standardized self-reported questionnaires, observation or specific tests to determine the capacity to participate in educational activities and/or the presence and/or severity of difficulties at kindergarten/school/university, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Vocational assessment	Vocational assessment aims to describe a person's vocational goals, capacity to work (general work readiness, skills and competencies for specific occupations) and/or a person's occupational performance at the current workplace. During the vocational assessment, information is collected on the individual's capacity and/or performance to complete expected or assigned tasks, organize themselves, work cooperatively with colleagues, take directions from supervisors, or supervise others. The vocational assessment (including initial screening to determine the need for comprehensive assessment) uses interviewing, standardized self-reported questionnaires, observation or specific tests to determine the capacity to work and/or the presence and/or severity of difficulties at work, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.

A1.2 Interventions

Intervention	Description of the intervention
ADL training	Activities of daily living (ADL) are tasks regularly performed as part of self-care activities (e.g. washing, caring for body parts, toileting, dressing, eating and drinking and looking after one's health) or instrumental activities (e.g. household tasks, acquisition of goods and services, and managing communication, relationships and finances). The training is directed towards an individual's goal to improve independence in daily living and consists of education, advice and training techniques in the context of functional tasks. These techniques are practised repetitively under the guidance or assistance of a health worker and, if feasible, self-directed by the patient following education and advice on the appropriate exercises.
Aerobic exercises	Aerobic exercises (also called cardio or cardiorespiratory exercises) use oxygen from the blood to meet the energy needs of the exercise. The exercises (e.g. walking, jogging, cycling or swimming) aim to improve exercise capacity and therefore, need to be performed regularly (e.g. at least 3 x week) with a certain dosage (low to high intensity, for 30 minutes, for example) as tolerated. Aerobic exercises are guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Analgesics	Prescription and/or administration (if injection) of the medicine and providing education and advice on the safe intake or administration (if self-directed) and potential adverse effects of the medicine.
Anticoagulants	Prescription and/or administration (if injection) of the medicine and providing education and advice on the safe intake or administration (if self-directed) and potential adverse effects of the medicine.
Antidepressants	Prescription and/or administration (if injection) of the medicine and providing education and advice on the safe intake or administration (if self-directed) and potential adverse effects of the medicine.
Balance training	For balance or postural control, sensory (vestibular, somatosensory and visual) information is processed to inform muscular responses that allow maintenance of a body position. Balance training aims to improve balance, motor control and coordination in order to improve movement-related activities (e.g. sitting, walking) and to reduce risk of falling. Balance exercises utilize different strategies (e.g. dual tasking, cueing) and are performed repetitively, with a specific level of difficulty (e.g. one-leg standing), for a specific period of time (e.g. 60 seconds). Balance training is guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Breathing exercises	Breathing exercises (e.g. active cycle of breathing techniques) aim to enhance the efficiency of the respiratory system by improving gas exchange and ventilation through the improvement of breathing patterns and mobilization of secretions. They are also applied for the prevention of pneumonia in people at risk, or to achieve physical and mental relaxation. The exercises are guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Carer and family training and support	Carer and family training and support entail providing education and advice about the health condition, strategies and tasks relevant for the care and support of the person in the rehabilitation process. Training and support also aim to equip carers and families with the knowledge, skills and resources to cope with their role successfully without developing health issues themselves. Carer and family training and support during the rehabilitation of the person in need comprise provision of information, resources, individual counselling, or support groups also involving peer counsellors.

Intervention	Description of the intervention
Cognitive behavioural therapy	Cognitive behavioural therapy (CBT) is a psychological therapy that combines cognitive components (aimed at thinking differently, for example through identifying and challenging unrealistic negative thoughts) and behavioural components (aimed at doing things differently, for example by helping the person to do more rewarding activities). During CBT sessions, exercises help the person to develop appropriate coping skills. CBT includes exercises, education and advice to help the person to develop appropriate coping skills to be applied in challenging situations.
Education and advice on self-directed exercises	Education on self-directed exercises entails providing information on exercises relevant for the improvement or maintenance of functioning and the prevention of health conditions. The individual advice aims to identify and discuss those exercises that best address the existing impairments, limitations or risks, and to develop an exercise programme that is appropriate to facilitate adherence, and a regular schedule to be maintained.
Education, advice and support for healthy lifestyle	Education on healthy lifestyle entails providing information on behaviours that aim to promote health and prevent disease, such as regular physical activity, healthy nutrition and avoiding substance use (alcohol, tobacco, drugs). The individual advice aims to identify and discuss strategies that best address the existing needs to achieve and maintain a healthy lifestyle. Support is provided to help the person in the rehabilitation process to change behaviours (e.g. increase health behaviours, stop risk behaviours) to achieve and maintain a healthy lifestyle. The education, advice and support for a healthy lifestyle can be performed in one-to-one or group sessions.
Education, advice and support for the self-management of the health condition	Education on self-management entails providing information about tasks relevant for the self-management of medical, emotional and social aspects related to the prevention of, or coping with, a health condition. The individual advice aims to identify and discuss those strategies which help to enhance the self-management skills that best suit the needs and capabilities of an individual to maintain or achieve independence and optimal participation in daily life. Support is provided whenever a person is not able to self-manage the issues related to the health condition. Support may also be provided by peers through sharing the same experiences or challenges as the person in the rehabilitation process, and supporting the person in the rehabilitation process in the development of self-management skills and coping strategies to achieve and maintain optimal functioning and well-being. The education, advice and support for self-management can be performed in one-to-one or group sessions.
Educational counselling, training and support	Educational activities are those that are accomplished in the context of education (kindergarten, school, university). Educational counselling supports an individual during school enrolment or return to school or to identify new educational goals and opportunities. Educational training is directed to achieve school enrolment, the return to, or maintenance at, school or university through learning (compensatory) strategies to perform the required tasks, taking into consideration functioning limitations or potential health risks. The training consists of education, advice and practising functional tasks and is guided or assisted by a health or social worker or (special) educator. Educational support (also sometimes referred to as "supported education") provides individual support to an individual at kindergarten, school or university to sustain long-term participation at school or university, usually involving the school, (special) educators or social workers.
Fitness training	Fitness training includes aerobic (e.g. walking, cycling) and anaerobic exercises (e.g. muscle-strengthening exercises) with the sufficient amount of intensity, duration and frequency to improve exercise capacity and strength. Exercises to improve flexibility and coordination (e.g. stretching, balance exercises) complete a fitness programme. The fitness training is guided by a health worker and, if feasible, performed self-directed by the patient following education and advice.

Intervention	Description of the intervention
Functional training	Functional training for hand and arm use attempts to train muscles in coordinated, multiplanar movement patterns and incorporates multiple joints, dynamic tasks, and consistent alterations in the base of support with the goal of making it easier for patients to perform their everyday activities. The training is practised repetitively under guidance of or assisted by a health worker and, if feasible, self-directed by the person following education and advice.
Gait training	Gait patterns are characterized by the specific sequences of limb and joint movements during a gait cycle. Gait training aims to normalize gait patterns but also to improve safe walking, walking speed and distance. It is based on task repetition, includes different strategies (e.g. cueing, dual tasking, attentional strategies) and is performed on varying surfaces or treadmills. Gait training is guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Graded sitting and standing training	Graded sitting and standing training aims to improve the ability of getting into and out of sitting and standing positions, and also to train the orthostatic system. Training consists of education, advice and techniques required for correct and safe changing of body position. The techniques are practised repetitively under guidance of or assisted by a health worker and, if feasible, self-directed by the person following education and advice.
Intra-articular corticosteroid injections	Prescription and/or administration (if injection) of the medicine and providing education and advice on the safe intake or administration (if self-directed) and potential adverse effects of the medicine.
Joint mobilization	Joint mobilization is a manual therapy intervention that uses passive arthrokinematic motion (gliding) to improve joint mobility and to reduce pain.
Manual therapy	Manual therapy is an approach that uses "hands-on" techniques (e.g. joint mobilization and manipulation, soft tissue techniques, passive movements, stretching) to improve tissue extensibility, increase joint mobility, optimize muscle function, modulate pain and reduce soft tissue swelling and inflammation.
Mobility training	Mobility comprises several activities, such as transferring, or changing the body position, and moving around indoors and outdoors either walking, with the help of an assistive product (e.g. a wheelchair) or using different means of transportation. Mobility training involves teaching and practising repetitive tasks and goal-directed exercises, along with, when necessary, compensatory strategies and training in the use of assistive products for mobility (e.g. training in wheelchair skills) to achieve the best possible mobility that is independent and safe. Mobility training is usually guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Modification of the home environment	The structure, layout, furniture and lighting of a home can facilitate or hinder functioning. Modification of the home environment may involve varying degrees of intervention that address environmental barriers and maximize safety, independence and performance of activities of daily living. These may include: • providing general advice and guidance on home modifications (including without seeing the home); • assessment of the home environment (i.e. visiting the home); • documenting/reporting structural and non-structural changes that are recommended, which may include drafting construction plans when relevant; • making environmental changes in the home, such as removing fall hazards, inserting visual cues, or moving items to make them more readily accessible; and/or • referring to appropriate service providers to conduct work beyond the scope of the health worker.

Intervention	Description of the intervention
Modification of the school environment	The structure, layout, furniture and lighting of a school environment can facilitate or hinder functioning. Modification of the school environment may involve varying degrees of intervention that address environmental barriers and maximize safety, independence and participation in learning and play. These may include: • providing advice and guidance on modifications to the school environment (including without seeing the school or classroom); • assessment of the school environment (i.e. visiting the school); • documenting/reporting structural and non-structural changes that are recommended, which may include drafting construction plans when relevant; and/or • referring to appropriate service providers to conduct work beyond the scope of the health worker.
Modification of the workplace environment	The structure, layout, furniture and lighting of a workplace can facilitate or hinder functioning. Modification of the workplace environment may involve varying degrees of intervention that address environmental barriers and maximize safety, independence and performance of work-related tasks. These may include: • providing advice and guidance on workplace modifications (including without seeing the workplace); • assessment of the workplace environment (i.e. visiting the workplace); documenting/reporting structural and non-structural changes that are recommended, which may include drafting construction plans when relevant; and/or • referring to appropriate service providers to conduct work beyond the scope of the health worker.
Muscle-strengthening exercises	Muscle-strengthening exercises aim to improve maximal muscle strength, muscle endurance and muscle mass. The exercises are performed regularly (e.g. 3 x week), at a certain dosage (e.g. with up to 80% of maximal power, 3 x 12 repetitions). The exercises (isometric or dynamic) are performed against gravity or resistance (e.g. body weight, weights, resistance bands) and guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Nutritional management	Nutritional (or dietary) management aims to achieve and maintain an appropriate nutritional status and supply of necessary nutrients in people with (or at risk for) malnutrition. Malnutrition refers to undernutrition, overweight or micronutrient-related malnutrition. Nutritional management includes diet modification, provision of adequate nutritional supplements (oral or enteral feeding) or modification of food and fluid consistency to ensure safe food intake. Nutritional management includes education and advice on the appropriate diet.
Participation focused interventions	A variety of activities (e.g. recreational or sports activities) present important opportunities to participate in communities and social life. Participation-focused interventions utilize such activities and integrate approaches that help to improve a person's skills to perform the activities with the overall goal to achieve optimal (re)integration and participation. Under guidance or assistance, different types of activities are offered and tried out (often as structured group activities), if feasible, with the participation of family members or friends.
Peer support	Peer support is an approach in which people, sharing the same experiences or challenges as the person in the rehabilitation process, support the person in the rehabilitation process in the development of self-management skills and coping strategies to achieve and maintain optimal functioning and well-being. Peer support in rehabilitation is organized by the rehabilitation team by bringing together peers, persons receiving rehabilitation and their families. It can be performed in one-to-one or group sessions.

Intervention	Description of the intervention
Physical exercise training	A variety of physical exercises (e.g. aerobic or strengthening exercises, balance or coordination exercises, mind–body exercises), with or without weight-bearing, are suitable to improve exercise capacity, muscle strength, joint mobility, voluntary movement, balance, gait and walking, as well as helping to reduce pain and fatigue. Regular physical exercise training (including education and advice on exercises) is planned according to an individual's need, guided or assisted and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Positioning for oedema control	Elevated positioning is one approach to oedema management. The swollen limb should be positioned above the level of the heart. Devices (pillows, rollers) may help to keep the limb in a stable position. Elevated positioning can be combined with other means, such as compression bandages or range of motion exercises. Education and advice are provided to the person to facilitate the self-directed positioning. Positioning is performed by a health worker and, if feasible, performed self-directed following education and advice on the appropriate positioning.
Provision and training in the use of assistive products for compression therapy	Assistive products for compression therapy comprise stockings (pieces of clothes that fit tightly around a body part), garments or bandages. Compression therapy supports blood vessel functions (e.g. to maintain blood pressure), and also helps to reduce oedema and scarring. Provision includes identification of the specific needs, selection, manufacture or modification, and adjustment of the compression garment. Following provision, the user will be trained in the garment's use and care.
Provision and training in the use of assistive products for mobility	The provision of assistive mobility devices (e.g. walking aids, transfer aids, manual or electrical wheelchairs with pressure cushions) support people to mobilize in different environments. Provision includes identification of the specific needs of the individual, as well as the selection, manufacture or modification, and adjustment of the appropriate device. Following provision, the patient will be trained in the use and care of the products.
Provision and training in the use of assistive products for recreation and leisure	The provision of assistive products (e.g. products for sports, handicrafts) that support people to improve and maintain their level of functioning and independence in recreational and leisure activities. Provision includes identification of the specific needs of the individual, as well as the selection, manufacture or modification, and adjustment of the appropriate product. Following provision, the patient will be trained in the use and care of the products.
Provision and training in the use of assistive products for self-care	The provision of assistive products for self-care (e.g. products for toileting, washing, grooming, dressing, eating) that support people to improve and maintain their level of functioning and independence in daily living. Provision includes the identification of the specific needs of the individual, as well as the selection, manufacture or modification, and adjustment of the appropriate product. Following provision, the patient will be trained in the use and care of the products.
Provision and training in the use of assistive products for work	The provision of assistive products (e.g. products to adapt the workstation) that support people to improve and maintain their level of functioning and independence in work and employment. Provision includes the identification of the specific needs of the individual, as well as the selection, manufacture or modification, and adjustment of the appropriate product. Following provision, the patient will be trained in the use and care of the products.
Provision and training in the use of lower limb prosthesis	The provision of a lower limb prosthesis contributes to the improvement of functioning related to walking or may also address cosmetic aspects. The provision includes identification of the specific needs of the individual, as well as the selection, manufacture or modification, and adjustment of the prosthesis. Following provision, the person will be taught and trained in the use and care of the prosthesis.

Intervention	Description of the intervention
Provision and training in the use of orthoses	Orthoses comprise assistive products such as orthotics, braces or splints. Orthoses support the stability of joints or bones by providing external stability to the body region. They may also help to reduce pain caused by movement of a body part and prevent contractures. The provision and training in the use of orthoses includes the identification of the specific needs of the individual, as well as the selection, manufacture or modification, and adjustment of the orthoses. Following provision, the person will be trained in the use and care of the orthoses.
Provision and training in the use of upper limb prosthesis	The provision of an upper limb prosthesis contributes to the improvement of functioning and may also address cosmetic aspects. The provision includes the identification of the specific needs of the individual, as well as the selection, manufacture or modification, and adjustment of the prosthesis. Following provision, the person will be taught and trained in the use and care of the prosthesis.
Psychological therapies	Psychological therapy uses different psychological approaches (e.g. psychoanalytical or psychodynamic therapies, behavioural or cognitive therapies, and integrative or holistic approaches) that help the client to eliminate or control symptoms and, thus, to improve psychosocial functioning in people with mental illnesses (e.g. depression, anxiety, stress disorders) or emotional difficulties (e.g. difficulties in coping with daily life). Psychological therapy is conducted in an individual, family, couple or group setting and is applied through conversation between health worker and client(s).
Range of motion exercises	Range of motion exercises are active, assisted or passive movements applied to a joint or limb, which can reduce muscle stiffness, pain, and swelling. Range of motion exercises also reduce the risk for deep venous thromboembolism through activating the muscle pump, and improve joint mobility by reducing the shortening of capsules and ligaments. The exercises are guided or assisted by a health worker and, if feasible, performed self-directed by the person following education and advice on the appropriate exercises.
Rigid dressing	Rigid dressings are removable or non-removable and aim to control swelling, protect the wound and prevent contractures during the postoperative phase following an amputation. They are individually manufactured and customized by a health worker.
Skin/wound care	Skin/wound care comprises a range of measures to prevent damage of the skin or to support wound healing, such as the cleaning of wounds and application of wound dressings, with regular monitoring of the progress of the wound healing along with education and advice. Skin/wound care is performed by a health worker and, if feasible, supported by the patient, caregiver, or family member after receiving training in the appropriate methods.
Soft tissue techniques	Soft tissue techniques comprise a variety of specific techniques (e.g. massage, muscle energy or trigger point technique, myofascial release) that aim to improve the tone and flexibility of muscles and soft tissue and can help to increase joint mobility or reduce pain.
Spinal manipulative therapy	Spinal manipulative therapy is a manual therapy intervention that uses controlled thrusts to a joint of the spine with the intention to restore the structural integrity of a joint and to reduce pain.
Stress management training	Stress management refers to the ability to cope with the physical, psychological and emotional effects of pressure, emergencies or other stressors. Stress management training uses different approaches (e.g. psychological, relaxation or mindfulness exercises) that aim to develop or improve skills to successfully cope with stressful situations. Stress management training commonly includes education, advice and training in specific exercises and the use of specific techniques.
Stretching	Stretching can help to improve the flexibility of muscles through reducing muscle stiffness or muscle tone. Consequently, it may help to reduce pain related to muscle stiffness and increase the range of motion in joints. Different types of stretching (static, dynamic) are guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.

Intervention	Description of the intervention
Thermotherapy	Thermotherapy (heat or cold) is applied to reduce pain, increase blood flow, or reduce inflammation or oedema. Heat or cold is administered, for example, by hot or cold packs, towels, cold air or sprays by a health worker or, if feasible, by the person themselves after education and advice on appropriate application and potential associated risks.
Vocational counselling, training and support	Vocational activities are activities that are accomplished in the context of the specific occupation of an individual. Vocational counselling supports an individual during return to work or to identify new vocational goals and opportunities. Vocational training is directed towards achieving a return to, or maintenance at, work through learning (compensatory) strategies to perform the required tasks, taking into consideration functioning limitations or potential health risks. The training consists of education, advice and practising functional tasks and is guided or assisted by a health or social worker. Vocational support provides individual support to an individual at the workplace to sustain long-term employment, usually involving the employer, supervisors or co-workers.
Weight-bearing exercises	Weight-bearing describes the amount of weight a person puts on a body part. Dosed weight load (partial, complete or with additional weights) stimulates bone growth and the proprioceptive system (including muscular response). Regular and prolonged weight-bearing can also contribute to the prevention of contractures and loss of bone density. Weight-bearing exercises are activities performed by putting weight on a body part and are guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.

Annex 2. Summary of declarations of interest and how these were managed

All members of the technical working groups, development groups and peer review groups completed and submitted a WHO Declaration of Interests form and signed confidentiality undertakings prior to starting the work related to the group. The WHO Department of Noncommunicable Diseases reviewed and assessed the submitted declarations of interest and performed an Internet search to identify any obvious public controversies or interests that may lead to compromising situations. If additional guidance on management of any declaration or conflicts of interest had been required, the department would have consulted with colleagues in the WHO Office of Compliance, Risk Management and Ethics. If deemed necessary, individuals found to have conflicts of interest, financial or non-financial, would have been excluded from participation on any topics where interests were conflicting. The management of conflicts of interest was reviewed throughout the process. No conflict of interest was identified.

A2.1 Technical working group members

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For low back pain			
Carolina CANCELLIERE	Clinical epidemiologist	None declared	N/A
Pierre CÔTE	Clinical epidemiologist	Research funds; consultancy; non-monetary support; public statements.	Not significant
Sabrina DONZELLI	PRM physician	Research funds	N/A
Francesca DI FELICE	PRM physician	None declared	N/A
Margareta NORDIN	Physiotherapist	None declared	N/A
Fabio ZAINA	PRM physician	None declared	N/A
For osteoarthritis			
Sina ARMAN	PRM physician	None declared	N/A
Aydan ORAL	PRM physician	Public statement; public position	Not significant
Ela TARAKCI	Physiotherapist	None declared	N/A
For rheumatoid arthritis			
Yeşim Kurtaiş AYTÜR	PRM physician	None declared	N/A
Yasaman ETEMADI	Physiotherapist	None declared	N/A
Ayşe KÜKÜKDEVECI	PRM physician	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For sarcopenia			
Nikolaos BAROTSIS	PRM physician	None declared	N/A
Chrysostomos PAZARIDIS	Physiotherapist	None declared	N/A
Ioanna TSIPRA	Occupational therapist	None declared	N/A
For fractures			
Francesca GIMIGLIANO	PRM physician	None declared	N/A
Giovanni IOLASCON	PRM physician	None declared	N/A
Antimo MORETTI	PRM physician	None declared	N/A
Giuseppe TORO	Orthopaedic surgeon	None declared	N/A
Sara LIGUORI	V-year resident in PRM	None declared	N/A
Claudio CURCI	IV-year resident in PRM	None declared	N/A
Maria SGARBANTI	I-year resident in PRM	None declared	N/A
Livia PESCHI	I-year resident in PRM	None declared	N/A
Sanaz POURNAJEF	Physiotherapist	None declared	N/A
For amputation			
Sofie JACOBS	Physiotherapist	Research funds	Not significant
Carlotte KIEKENS	PRM physician	Research funds	Not significant
Arne HEYNS	PRM physician	None declared	N/A
An DE GROEF	Physiotherapist	None declared	N/A

A2.2 Development group members

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For low back pain			
Chiara ARIENTI	Osteopath	None declared	N/A
Lily Ann D BAUTISTA	Physiotherapist	None declared	N/A
Martin CAMARA	Chiropractor	Employment; consultancy; non-monetary support; shares of stokes; public statements and positions	Not significant
Christine CEDRASCHI	Psychologist	None declared	N/A
Pierre CÔTE	Epidemiologist	Non-monetary support (paid travel)	Not significant
Vincent EMORE	Occupational therapist	None declared	Not significant
Andrew HAIG	PRM physician	Employment; consultancy; intellectual property	Not significant

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
Jan HARTVIGSEN	Chiropractor	None declared	N/A
Jaro KARPPINEN	PRM physician	Consultancy; non-monetary support.	Not significant
Dinesh KUMBHARE	PRM physician	None declared	N/A
Jae-Young LIM	PRM physician	None declared	N/A
Karen LIU	Occupational therapist	Employment	N/A
Margareta NORDIN	Physiotherapist	Consultancy; research funds; non-monetary support	Not significant
Rajani MULLERPATAN	Physiotherapist	None declared	N/A
Takashi NAKAYAMA	Physiotherapist	Consultancy	Not significant
Shadrak OKUMU	Physiotherapist	None declared	N/A
Geoffrey OUTERBRIDGE	Chiropractor	Consultancy	Not significant
Farooq Azam RATHORE	PRM physician	None declared	N/A
Elisabete ROLDAO	Occupational therapist	None declared	N/A
Jessica WONG	Chiropractor	None declared	N/A
Fabio ZAINA	PRM physician	Employment	Not significant
For osteoarthritis			
Andrew BRIGGS	Physiotherapist	Consulting; research funds	Not significant
Maria CROTTY	PRM physician	None declared	N/A
Wilfired DAHOUETO	Physiotherapist	None declared	N/A
Syed Atiqul HAQ	Rheumatologist	Commercial business interests	Not significant
David HUNTER	Rheumatologist	Research funds	N/A
Elena ILIEVA	PRM physician	None declared	N/A
Nitin JAIN	PRM physician	None declared	N/A
Win Min OO	PRM physician	None declared	N/A
Cliona O'SULLIVAN	Physiotherapist	None declared	N/A
Biatres MANESWA	Occupational therapist	None declared	N/A
Donald MANLAPAZ	Physiotherapist	None declared	N/A
Ewa ROOS	Physiotherapist	Editor of scientific journal; developer of outcome measure; co-founder of a non-profit organization	Not significant
Beatrice SANKAH	Physiotherapist	None	N/A
Saurab SHARMA	Physiotherapist	None declared	N/A
Matthew WILLIAMS	Physiotherapist	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For rheumatoid arthritis			
Catherine BACKMAN	Occupational therapist	Research funds	Not significant
Adjoa BANSON	Physiotherapist	None declared	N/A
Loreto CARMONA	Rheumatologist	None declared	N/A
Peter CHEUNG	Rheumatologist	Research funds	Not significant
Mireille DOMIGOU	Physiotherapist	None declared	N/A
Mehmet Tuncay DURUÖZ	Rheumatologist	None declared	N/A
Gregory HALFORD	Prosthetist and orthotist	None declared	N/A
Thearith HEANG	Prosthetist and orthotist	None declared	N/A
Ayşe KÜKÜKDEVECI	PRM physician	None declared	N/A
Mamta KUMARI	Prosthetist and orthotist	None declared	N/A
Luz Helena LUGO AGUDELO	PRM physician	None declared	N/A
Carol Mc CRUM	Physiotherapist	None declared	N/A
Longini Basil MTALO	Prosthetist and orthotist	None declared	N/A
Amy Lynn NAUDE	Occupational therapist	Research funds	Not significant
Karin NIEDERMANN	Physiotherapist	None declared	N/A
Jacqueline PAHUWA	Physiotherapist	None declared	N/A
Karma PHUENTSHO	Physiotherapist	None declared	N/A
Shirima REMLA	Physiotherapist	None declared	N/A
Erner SHERIDAN	Occupational therapist	None declared	N/A
Anwar SUHAIMI	PRM physician	None declared	N/A
Salima VAN WEELY	Physiotherapist	Consultancy	Not significant
Suzanne VERSTAPPEN	Epidemiologist	None declared	N/A
For sarcopenia			
Nikolaos BAROTISI	PRM physician	None declared	N/A
Antoniadou ELEFTHERIA	PRM physician	None declared	N/A
Hidenori ARAI	Geriatrician	None declared	N/A
Cara BROWN	Occupational therapist	Research funds	N/A
Conde MONTSERRAT	Physiotherapist	None declared	N/A
Walter FRONTERA	PRM physician	Research funds	N/A
Leon GEFFEN	Family physician	Employment; consultancy, research funds, non-monetary support	Not significant
Ricardo GUERRA	Physiotherapist	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
Jae Young LIM	PRM physician	None declared	N/A
Manuel MONRROY UARAC	Physiotherapist	None declared	N/A
Sarah RAZAQ	PRM physician	None declared	N/A
Priscila Yukari Sewo SAMPAIO	Occupational therapist	None declared	N/A
Kim STUART	Occupational therapist	None declared	N/A
For fractures			
Momen AHMAD	Physiotherapist	None declared	N/A
Maddalena Lucia BERNHARD	Physiotherapist	None declared	N/A
Anne BOIS D' ENGHIEN	Physiotherapist	None declared	N/A
Dorothy BOAKYE-ANSAH-ASAMOAH	Physiotherapist	None declared	N/A
Eduardo DE MELO CARVALHO ROCHA	PRM physician	None declared	N/A
Gerold EBENBICHLER	PRM physician	None declared	N/A
Amira FLEETY	Physiotherapist	None declared	N/A
Alom FOISAL	Physiotherapist	None declared	N/A
Francesca GIMIGLIANO	PRM physician	None declared	N/A
Bea HEMMEN	Rehabilitation consultant	None declared	N/A
Erlis ILJAZI	Prosthetist and orthotist	None declared	N/A
Angeth JERVAS MAJOK	Physiotherapist	Employment	Not significant
Ranjeet KUMAR	Prosthetist and orthotist	None declared	N/A
Stephen MANNION	Orthopaedic surgeon	None declared	N/A
Allison NABER	Occupational therapist	None declared	N/A
Tshering NORBU	Physiotherapist	None declared	N/A
Bara'a Ahmad Naji ODEH	Physiotherapist	None declared	N/A
Lawrence ROBINSON	PRM physician	Research funds	Not significant
Camila RODROGUEZ GUEVARA	Occupational therapist	None declared	N/A
Kazuhiro SAKAI	Prosthetist and orthotist	None declared	N/A
Imran SHOAIB	Prosthetist and orthotist	None declared	N/A
Stephney WEERASINGHE	Prosthetist and orthotist	Employment	Not significant

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For amputation			
Jonathan BATZDORFF	Prosthetist and orthotist	None declared	N/A
Ana P. CHAVIRA-MENDOZA	Consumer representative	None declared	N/A
Sabine CICCONE	Physiotherapist	Employment	Not significant
Mariette DEIST	Prosthetist and orthotist	None declared	N/A
Deirdre DESMOND	Psychologist	None declared	N/A
Charne FERIS	Occupational therapist	None declared	N/A
Kerstin HAGBERG	Physiotherapist	Consultancy; research funds; public position.	Not significant
Rajiv HANSPAL	PRM physician	Employment; consultancy; public statements; public position; paid travels	Not significant
Carlotte KIEKENS	PRM physician	Research funds	Not significant
Tsitsi MUROVE	Occupational therapist	None declared	N/A
Man Sang WONG	Prosthetist and orthotist	None declared	N/A
Jay Narayan YADAV	Physiotherapist	None declared	N/A

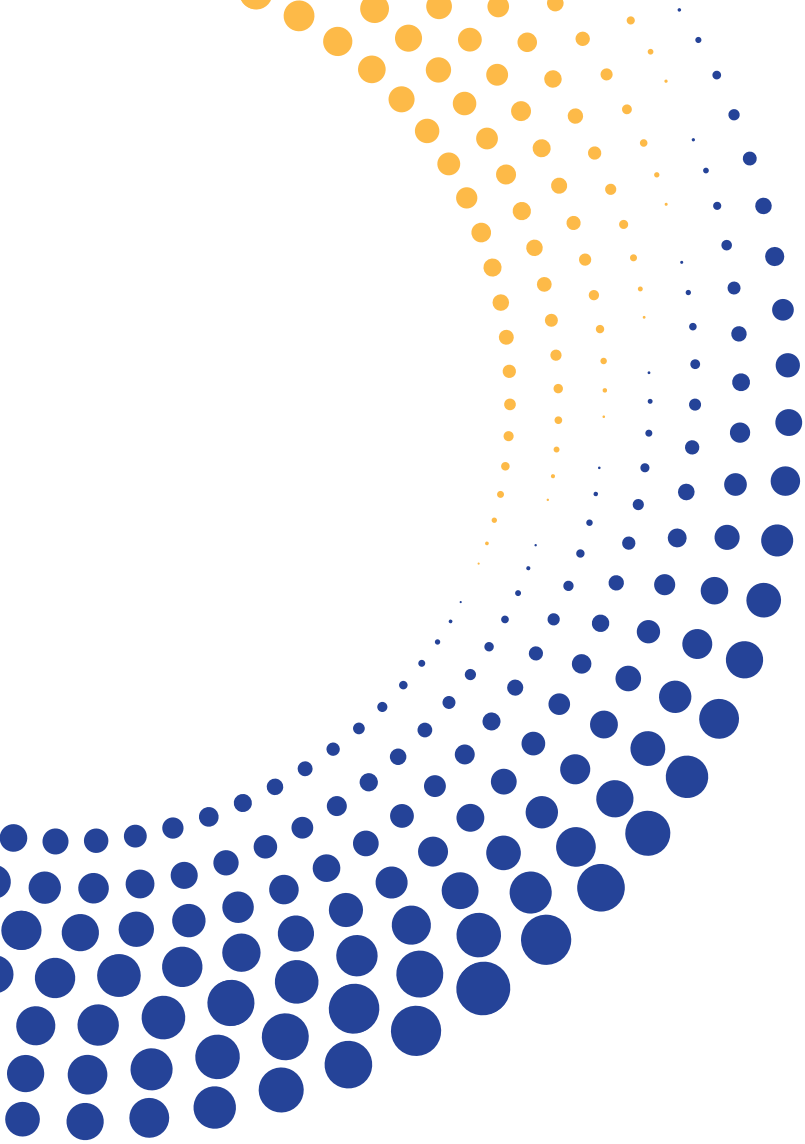
A2.3 Peer review group members

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For low back pain, osteoarthritis, rheumatoid arthritis, and fractures			
Hana ALSOBYAEL	Physiotherapist	Consultancy; research funds; non-monetary support; commercial business interests (physiotherapy practice); member of SPINE20 scientific committee	Not significant
Nicole ANDREWS	Occupational therapist	Consultancy; research funds	Not significant
Godfrey ASIIMWE	Prosthetist and orthotist	None declared	N/A
Joaquim CHALER	Medical doctor	Commercial business interest	Not significant
Yvonne CODD	Occupational therapist	None declared	N/A
Carlos CORDERO GARCIA	PRM physician	Non-monetary support	N/A
Amal DAAR	Prosthetist and orthotist	None declared	N/A
Parthajit DAS	Rheumatologist	None declared	N/A
Karsten DREINHÖFER	Orthopaedic surgeon	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
Stefan EBERSPAECHER	Chiropractor	Employment; consultancy	Not significant
Steven FAUX	PRM physician	Research funds; public statements	Not significant
Manuela FERREIRA	Physiotherapist	None declared	N/A
Roy FILM	Physiotherapist	Public position	N/A
Helen FOSTER	Rheumatologist	None declared	N/A
Giovanni GALEOTO	Physiotherapist	None declared	N/A
Mary GRANT	Physiotherapist	None declared	N/A
Monika I. HASENBRING	Psychologist	None declared	N/A
Ziad HAWAMDEH	Physician	None declared	N/A
Kiyoshi ISHII	Occupational therapist	None declared	N/A
Sisary KHENG	Prosthetist and orthotist	None declared	N/A
Katariina KORNILOFF	Physiotherapist	None declared	N/A
Nimrod LIRAM	Chiropractor	Public statements	Not significant
Angela LIS	Physiotherapist	None declared	N/A
Everard MUNTING	Orthopaedic surgeon	None declared	N/A
ANM Mashud RANA	Physiotherapist	None declared	N/A
Lisa ROBERTS	Physiotherapist	Consultancy; research funds; public position	Not significant
Chunara SAMEER	Physiotherapist	None declared	N/A
Berit SCHIOTZZ-CHRISTENSEN	Rheumatologist	Consultancy	Not significant
Vincent SETLHARE	Family physician	None declared	N/A
Patricia SIEGEL	Occupational therapist	None declared	N/A
Chun Lung SO	Physiotherapist	None declared	N/A
Pia POTTORNO RUBIO	PRM physician	None declared	N/A
Marco TOFANI	Occupational therapist	None declared	N/A
Shira WEINER	Physiotherapist	None declared	N/A
Sherri WEISER	Psychologist	Consultancy	Not significant
Jackie WHITTAKER	Physiotherapist	None declared	N/A
Adam WILKEY	Chiropractor	None declared	N/A
Ernest WISNIEWSKI	Physiotherapist	None declared	N/A
Zbigniew WRONSKI	Physiotherapist	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For sarcopenia			
Liang-Kung CHEN	Geriatritian	None declared	N/A
Henrietta FAWOLE	Physiotherapist	None declared	N/A
Der-Sheng HAN	PRM physician	Research funds	Not significant
Marco INZITARI	Geriatritian	None declared	N/A
Wee-Shiong LIM	Geriatritian	Research funds	Not significant
Sunita MATHUR	Physiotherapist	None declared	N/A
Louise McGREGOR	Physiotherapist	None declared	N/A
Jennifer MUHAIDAT	Physiotherapist	None declared	N/A
Gabriel MASRI MARZUCA-NASSR	Physiotherapist	Research funds	Not significant
Ricardo Aurelio Carvalho SAMPAIO	Physical educator	None declared	N/A
Eva-Maria STRASSER	PRM physician	None declared	N/A
Janet THOMAS	Physiotherapist	None declared	N/A
Margaretha VAN DIJK	Physiotherapist	None declared	N/A
Hidetaka WAKABAYASHI	PRM physician	Research funds; public statement; public position	Not significant
For amputation			
Yusuph Abiodun ODEYOYIN	Occupational therapist	None declared	N/A
Noor Jahan AKHTAR	Physiotherapist	None declared	N/A
Firoz ALIZADA	Consumer representative	None declared	N/A
Raed Alkhattab	Biomedical engineer and CPO	None declared	N/A
Ajediran BELLO	Physiotherapist	None declared	N/A
Laura BLAKE	Physiotherapist	Employment; public position	Not significant
Helena BURGER	PRM physician	None declared	N/A
Yatma FALL	Consumer representative	None declared	N/A
Ritu GHOSH	Prosthetist and orthotist	None declared	N/A
Claudine HUMURE	Consumer representative	Research funds	N/A
Cody McDONALD	Prosthetist and orthotist	None declared	N/A
Saffran MÖLLER	Physiotherapist	Research funds	N/A
Pooja MUKUL	PRM physician	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
Peter NDAA	Occupational therapist	Research funds; non-monetary support.	Not significant
Nehad NEGATU	Physiotherapist	None declared	N/A
Md Mahfuzur RAHMAN	Occupational therapist	None declared	N/A
Reynaldo REY-MATIAS	PRM physician	None declared	N/A
Tahmineh REZAEIAN	Prosthetist and orthotist	None declared	N/A
Carolina SCHIAPPACASSE	PRM physician	None declared	N/A
Lea STUDER	Physiotherapist	None declared	N/A
John Paul SULLIVAN	Prosthetist and orthotist	None declared	N/A
Nils-Odd TØNNEVOLD	Consumer representative	None declared	N/A
Stephen WEGENER	Rehabilitation psychologist	None declared	N/A



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