

Package of interventions for
Rehabilitation
Module 4
Cardiopulmonary conditions

Package of interventions for rehabilitation

Module 4 Cardiopulmonary conditions

Package of interventions for rehabilitation. Module 4. Cardiopulmonary 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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1 Package of interventions for rehabilitation for ischaemic heart disease

1.1 About ischaemic heart disease

Ischaemic heart disease is the single most common cause of death globally (1). In 2019, ischaemic heart disease and stroke were the top-ranked causes of disability-adjusted life years (DALYs) in both the 50–74-year, and 75-years and older age groups (2). Ischaemic heart disease is caused by reduced blood supply to the heart due to a build-up of fatty substances in the coronary arteries, referred to as arteriosclerosis. The lack of sufficient blood supply often causes symptoms such as chest pain (angina pectoris), shortness of breath, general pain, feeling faint or nauseous (3). Ischaemic heart disease can result in a heart attack if not diagnosed and treated. A heart attack occurs when the blood flow to the heart is severely reduced or cut off completely, such that some muscle dies and the heart is unable to pump as normal (4). Risk factors for ischaemic heart disease include high blood pressure, high cholesterol, high lipoprotein, diabetes, lack of regular exercise, tobacco use, overweight and obesity, as well as a family history (3). Many of these risk factors can be prevented.

Ischaemic heart disease and the related consequences of heart attack can lead to severe limitations in performing physical activities, as well as to high levels of anxiety and depression and overall reduced quality of life. Coping with such limitations, adjustment to new treatments, and the adjustment of lifestyle is often challenging for people living with ischaemic heart disease. Furthermore, they are vulnerable to (additional) cardiac events (5).

Role of rehabilitation in ischaemic heart disease

Cardiac rehabilitation supports people with ischaemic heart disease to improve cardiovascular health and adjust to the consequences of the disease (6). It aims to help them achieve, restore and maintain optimal levels of functioning, and also to prevent additional cardiac events, particularly following myocardial infarction. The interventions for rehabilitation are tailored to the individual's needs, but most often address the following main components: physical exercise to improve exercise capacity; education on healthy lifestyle (including regular exercise, healthy diet, tobacco cessation) to improve self-management skills; and stress management and mental health to improve coping with the condition and related symptoms (4). Furthermore, interventions supporting a return to work may also be beneficial to many people living with ischaemic heart disease.

Target population for the Package of interventions for rehabilitation for ischaemic heart disease

This *Package of interventions of rehabilitation for ischaemic heart disease* is intended to be used for adults with acute (International Classification of Diseases, 11th revision (ICD-11): BA40 Angina pectoris; BA41 Acute myocardial infarction; BA42 Subsequent myocardial infarction; BA43 Coronary thrombosis not resulting in myocardial infarction) and chronic (ICD-11: BA50 Old myocardial infarction; BA51 Ischaemic cardiomyopathy; BA52 Coronary atherosclerosis) ischaemic heart disease, including those with complications following myocardial infarction (ICD-11: BA60 Certain current complications following acute myocardial infarction).

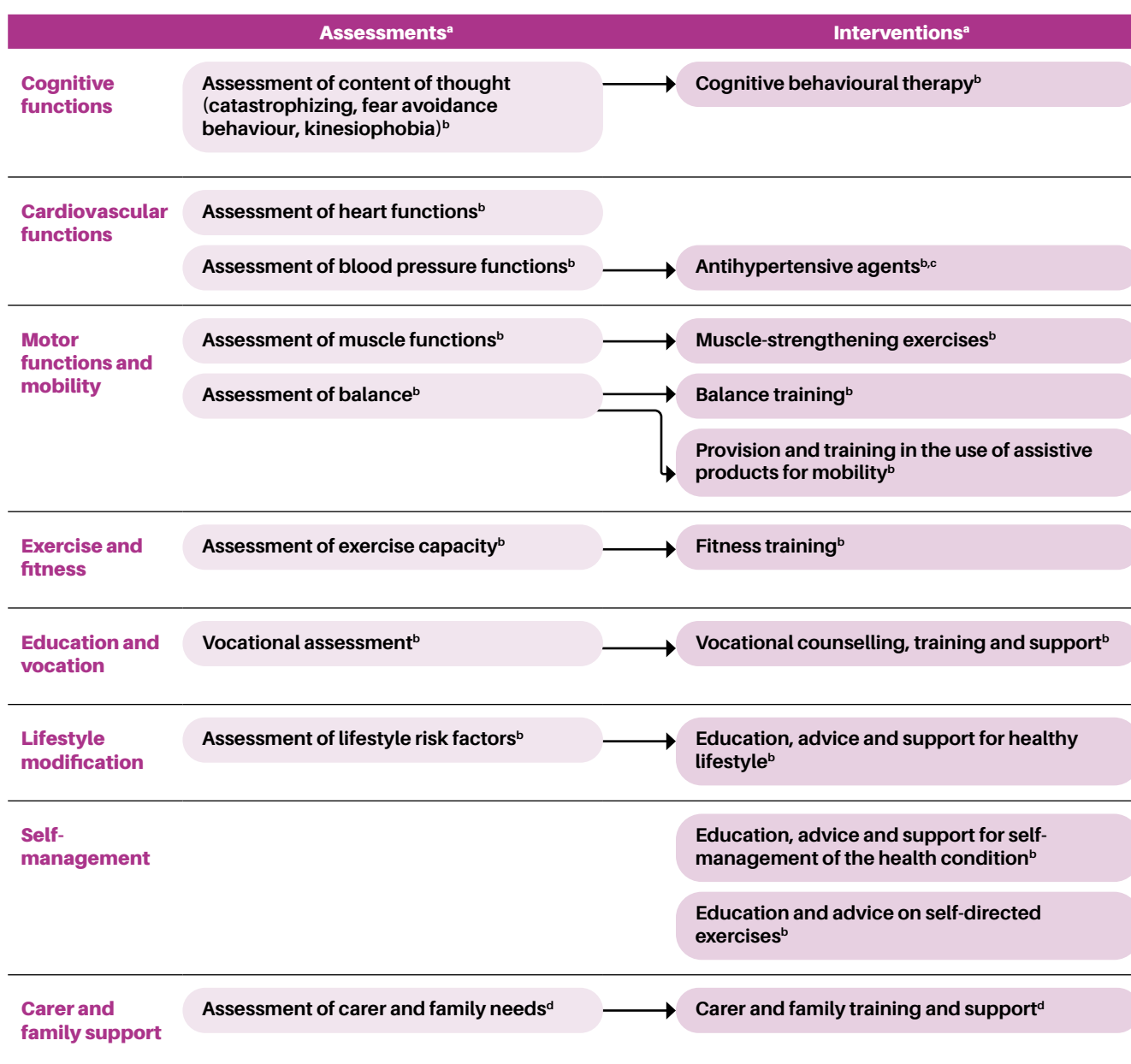
Important links to other WHO products relevant for the care of people with ischaemic heart disease

- *WHO Package of Essential Noncommunicable (PEN) disease interventions for primary health care (7).*
- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (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 (9).*
- *WHO Model List of Essential Medicines (10).*

1.2 Content of the Package of interventions for rehabilitation for ischaemic heart disease

Overview of the interventions for rehabilitation in ischaemic heart disease

Functioning interventions



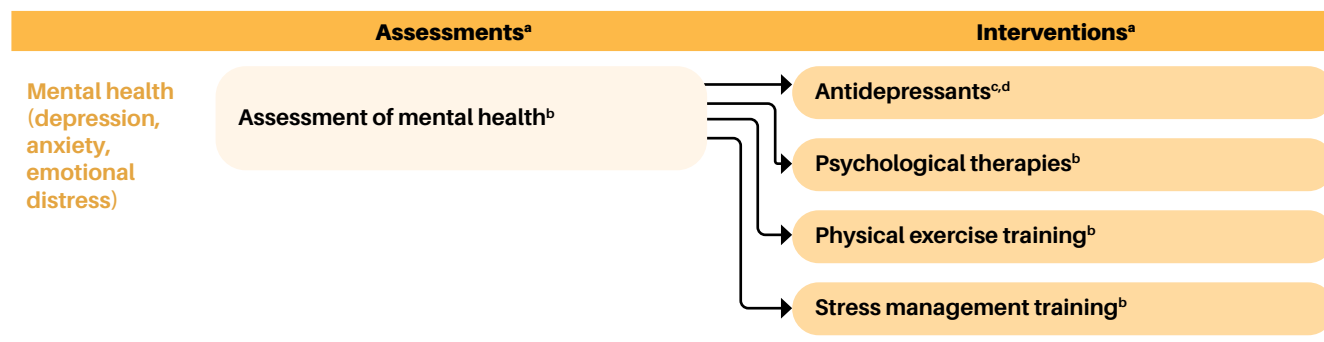
^a See Annex 1 for definitions of assessments and interventions.

^b Adults with ischaemic heart disease.

^c Medicines are included in WHO's Model List of Essential Medicines (10).

^d Family and carers of adults with ischaemic heart disease.

Interventions for the prevention and treatment of secondary conditions related to ischaemic heart disease



^a See Annex 1 for definitions of assessments and interventions.

^b Adults with ischaemic heart disease.

^c Adults with ischaemic heart disease and moderate to severe depression.

^d Medicines are included in WHO's Model List of Essential Medicines (for specification of the medicines (10)).

Overview of the resources required for rehabilitation in ischaemic heart disease

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, kinesiophobia)					
	Assessment of content of thought (catastrophizing, fear avoidance beliefs, kinesiophobia)	20	-	-	-	<ul style="list-style-type: none"> • Psychologist • Specialist medical practitioner/ PRM physician
	Cognitive behavioural therapy	60	-	-	-	<ul style="list-style-type: none"> • Psychologist
Cardiovascular functions	Target: Heart functions					
	Assessment of heart functions	60	-	<ul style="list-style-type: none"> • Electrocardiographic system 	<ul style="list-style-type: none"> • Electrodes (replaceable sticky) 	<ul style="list-style-type: none"> • Specialist medical practitioner/ PRM physician
	Target: Blood pressure functions					
	Assessment of blood pressure functions	5	-	<ul style="list-style-type: none"> • Blood pressure measurement device 	-	<ul style="list-style-type: none"> • Nursing professional • Specialist medical practitioner/ PRM physician
	Antihypertensive agents	5	-	-	<ul style="list-style-type: none"> • Antihypertensive agents 	<ul style="list-style-type: none"> • Specialist medical practitioner/ PRM physician
Motor functions and mobility	Target: Muscle power functions					
	Assessment of muscle functions	20	-	<ul style="list-style-type: none"> • Hand-held dynamometer • Treatment table 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Muscle-strengthening exercises	20	-	<ul style="list-style-type: none"> • Treatment table • Weights • Resistance bands • Exercise mats 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	Target: Balance					
	Assessment of balance	20	-	<ul style="list-style-type: none"> • Timer • Measuring tape 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Balance training	20	-	<ul style="list-style-type: none"> • Balance board/cushion • Exercise mats • Timer • Steps 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
	Provision and training in the use of assistive products for mobility	30	<ul style="list-style-type: none"> • Canes/sticks/tetrapod • Rollators • Walking frames/walkers 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
Exercise and fitness	Target: Exercise tolerance functions					
	Assessment of exercise capacity	30	-	<ul style="list-style-type: none"> • Automated external defibrillator • Blood pressure measurement device • Cycle ergometer (arm or leg) • Electrocardiographic system • Heart rate monitor • Pulse oximeter • Stethoscope • Stress exercise monitoring system • Timer 	• Electrodes, electrolytic gel	<ul style="list-style-type: none"> • Physiotherapist • Specialist medical practitioner/ PRM physician
	Fitness training	30	-	<ul style="list-style-type: none"> • Automated external defibrillator • Blood pressure measurement device • Stethoscope • Pulse oximeter • Cycle ergometer (arm or leg) • Electrocardiographic system • Exercise ball • Exercise mats • Resistance bands • Timer • Weights 	• Electrodes, electrolytic gel	• 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	• Information materials (e.g. flyers, brochures)	• 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. smoking cessation, diet management, regular physical activity)	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)	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education and advice on self-directed exercise	45	-	-	• Information materials (e.g. flyers, brochures)	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Carer and family support	Target: Family and carer support					
	Assessment of carer and family needs	30	-	-	-	<ul style="list-style-type: none"> • Nursing professional • Occupational therapist • Psychologist • Social work and counselling professional
	Carer and family training and support	45	-	-	<ul style="list-style-type: none"> • Information materials (e.g. flyers, brochures) 	<ul style="list-style-type: none"> • Nursing professional • Occupational therapist • Psychologist • Social work and counselling professional

PRM: physical and rehabilitation medicine.

Interventions for the prevention and treatment of secondary conditions related to ischaemic heart disease

	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	-	-	-	<ul style="list-style-type: none"> • 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	-	<ul style="list-style-type: none"> • Cycle ergometer (arm or leg) • Resistance bands • Weights • Exercise mat 	-	• 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 mobility <ul style="list-style-type: none">• Canes/sticks/tetrapod• Rollators• Walking frames/walkers	Specific for assessment <ul style="list-style-type: none">• Blood pressure measurement device• Electrocardiographic system• Hand-held dynamometer• Heart rate monitor• Pulse oximeter• Stress exercise monitoring system• Stethoscope• Measuring tape• Scale weight For intervention <ul style="list-style-type: none">• Automated external defibrillator• Treatment table• Resistance bands• Weights• Exercise mat• Exercise ball• Balance board/cushion• Steps• Cycle ergometer (arm or leg)• Timer• Work-related tools and equipment	<ul style="list-style-type: none">• Replaceable sticky electrode pads• Electrolytic gel• Information materials (e.g. flyers, brochures) Medicines <ul style="list-style-type: none">• Antihypertensive agents• Antidepressants

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation for ischaemic heart disease (in alphabetical order)

- Dietitians and nutritionists
- Nursing professionals
- Occupational therapists
- Peer counsellors
- Physiotherapists
- Psychologists
- 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 ischaemic heart disease* 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.

Members of the technical working group

Diann GAALEMA (Health behaviour change scientist, United States of America (USA)); Sherry L GRACE (Psychology and Health service scientist, Canada); Vрати MEHRA (Researcher, Canada).

Members of the development group

Wael ALMAHED (Cardiologist, United Arab Emirates); Abraham BABU (Physiotherapist, India); John BUCKLEY (Clinical exercise physiologist, United Kingdom of Great Britain and Northern Ireland); Jonathan GALLAGHER (Psychologist, Ireland); Sherry GRACE (Psychology and Health service scientist, Canada); Martin HEINE (Occupational therapist, Movement scientist, Netherlands (Kingdom of the)); Hellen NAMASENBE (Physiotherapist, Uganda); Shashi OBERAI (Occupational therapist, India); Ronel ROOS (Physiotherapist, South Africa); Masoumeh SADEGI (Cardiologist, Islamic Republic of Iran); Pamela SERÓN (Physiotherapist, Chile); Marta SUPERVIA (PRM physician, Spain); Karam TURK-ADAWI (Health/Social scientist, Canada); Jamal UDDIN (Physiotherapist, Bangladesh); Tee Joo YEO (Cardiologist, Singapore).

Members of the peer review group

Myat Bhone AUNG (PRM physician, Myanmar); Aashish CONTRACTOR (PRM physician, India); Frank DOYLE (Psychologist, Ireland); Sumaira FAROOQUI (Physiotherapist, Pakistan); Robyn GALLAGHER (Nurse, Australia); Abderrazak HAJJIOUI (PRM physician, Morocco); Mariya JIANDANI (Physiotherapist, India); Kushal MADAN (Physiotherapist, India); Carla MALAGUTI (Physiotherapist, Brazil); María José OLIVEROS (Physiotherapist, Chile); Mara PANERONI (Physiotherapist, Italy); Dawn SCANTLEBURY (Cardiologist, Barbados); Anwar SUHAIMI (PRM physician, Malaysia).

Prebo BARANGO (WHO medical officer, WHO Management - Screening, Diagnosis and Treatment of Noncommunicable Disease Unit) provided valuable feedback to the draft version of the Package of interventions for rehabilitation for ischaemic heart disease.

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8. 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).
9. 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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2 Package of interventions for rehabilitation for chronic obstructive pulmonary disease

2.1 About chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease is a common, preventable and treatable chronic lung disease which affects men and women worldwide. The disease develops gradually over time, often resulting from a combination of risk factors (tobacco exposure, occupational exposure, indoor air pollution, early life events, and genetic factors) (1). Nearly 90% of deaths due to chronic obstructive pulmonary disease in people aged under 70 years occur in low- and middle-income countries (1).

Abnormalities in the small airways of the lungs lead to limitation of airflow in and out of the lungs. Several processes cause the airways to become narrow. There may be destruction of parts of the lung, mucus blocking the airways, and inflammation and swelling of the airway lining (1). Exacerbations and comorbidities contribute to the overall severity in individual patients.

Common symptoms of chronic obstructive pulmonary disease develop from mid-life onwards and include breathlessness or difficulty breathing, chronic cough, often with phlegm, and tiredness. As the condition progresses, people often encounter breathlessness and find it more difficult to carry out their normal daily activities; as a consequence, they may experience limitations in productivity in their home and workplace.

During flare-ups, people with chronic obstructive pulmonary disease find their symptoms worsen and they may need to receive additional treatment at home or be admitted to hospital for emergency care. Severe flare-ups can be life-threatening. Furthermore, people with the disease often have other medical conditions such as heart disease, osteoporosis, musculoskeletal disorders, lung cancer, depression and anxiety.

Role of rehabilitation in chronic obstructive pulmonary disease

It is estimated that in 2019, 118 million people worldwide were living with chronic obstructive pulmonary disease and associated problems in functioning that could benefit from rehabilitation (2). Pulmonary rehabilitation is a key component in the management of people with the condition to achieve and maintain optimal levels of functioning. Interventions for rehabilitation are effective in reducing symptoms of breathlessness and fatigue and contribute to improving health-related quality of life (3) and to reduce hospital readmission related to acute exacerbation (4). Specific interventions for rehabilitation empower people to cope with the related symptoms related (e.g. breathlessness or cough) and to develop strategies to perform activities despite these symptoms and to regain and maintain their exercise capacity. Furthermore, rehabilitation supports people with chronic obstructive pulmonary disease to keep engaged in meaningful activities, such as work and social life.

Target population for the Package of interventions for rehabilitation for chronic obstructive pulmonary disease

This *Package of interventions of rehabilitation for chronic obstructive pulmonary disease* is intended to be used for adults with chronic obstructive pulmonary disease including those with acute exacerbation (ICD-11: CA22.0 Chronic obstructive pulmonary disease with acute exacerbation, unspecified) and with certain specified chronic obstructive pulmonary disease (ICD-11: CA22.1 Certain specified chronic obstructive pulmonary disease).

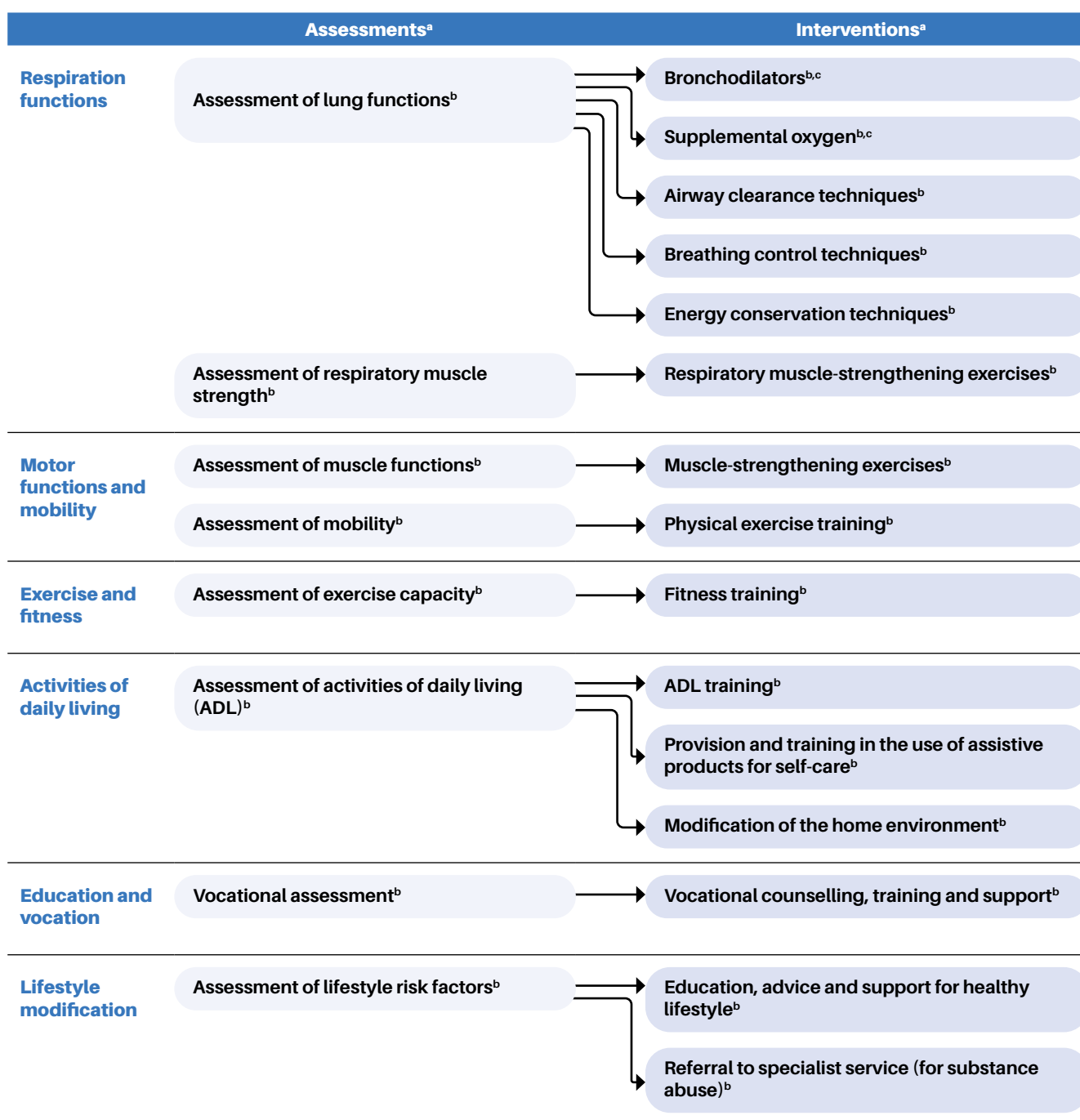
Important links to other WHO products relevant for the care of people with COPD

- *WHO Package of Essential Noncommunicable (PEN) disease interventions for primary health care (5).*
- *Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity (ICOPE) (6).*
- *mhGAP intervention guide for mental, neurological and substance use disorders in non-specialized health settings: mental health GAP Action Programme (mhGAP) – version 2.0 (7).*
- *WHO Model List of Essential Medicines (8).*

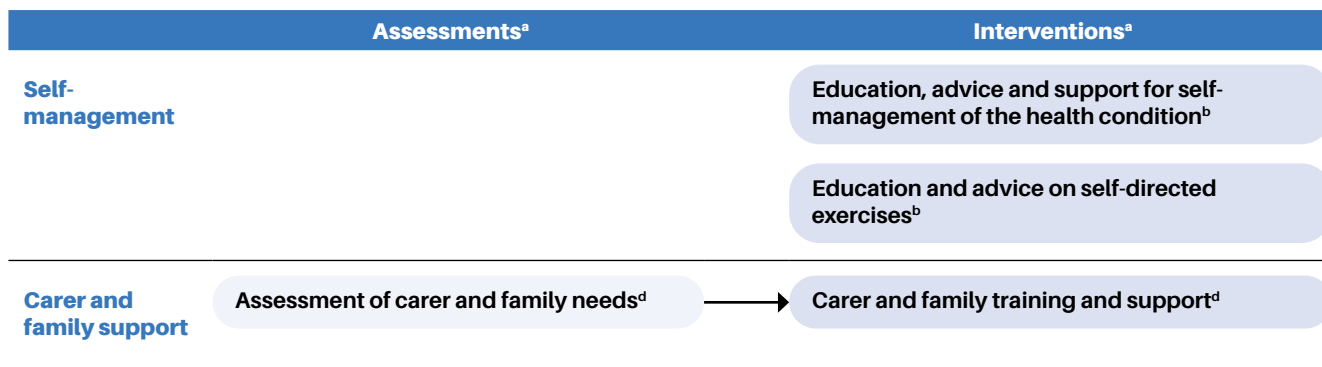
2.2 Content of the Package of interventions for rehabilitation for chronic obstructive pulmonary disease

Overview of the interventions for rehabilitation in chronic obstructive pulmonary disease

Functioning interventions



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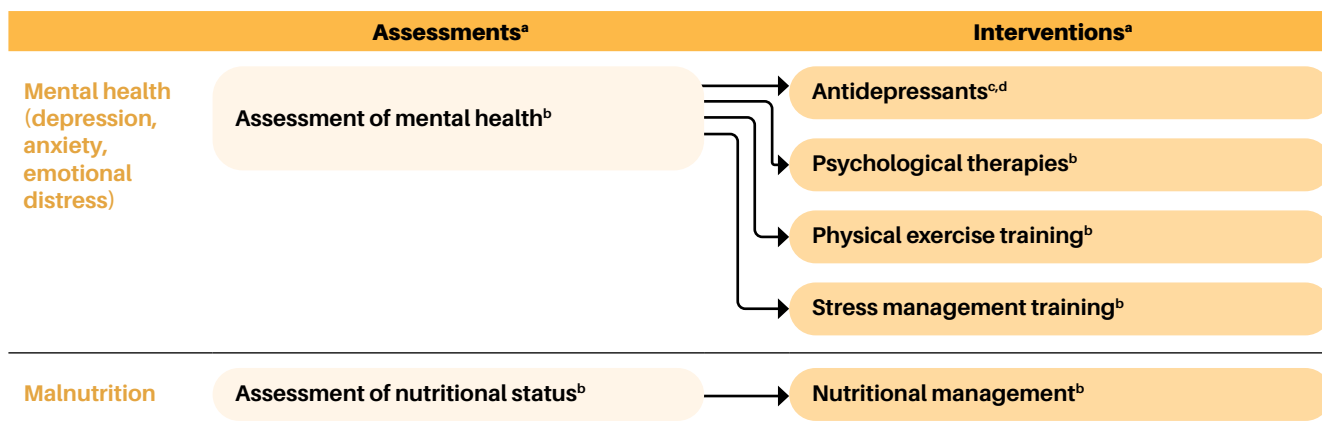
^a See Annex 1 for definitions of assessments and interventions.

^b Adults with chronic obstructive pulmonary disease.

^c Medicines are included in WHO Model List of Essential Medicines (8).

^d Family and carers of adults with chronic obstructive pulmonary disease.

Interventions for the prevention and treatment of secondary conditions related to chronic obstructive pulmonary disease



^a See Annex 1 for definitions of assessments and interventions.

^b Adults with chronic obstructive pulmonary disease.

^c Adults with chronic obstructive pulmonary disease and moderate to severe depression.

^d Medicines are included in WHO Model List of Essential Medicines (8).

Overview of the resources required for rehabilitation in chronic obstructive pulmonary disease

Functioning interventions

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Target: Respiratory functions					
Assessment of lung function	30	-	• Spirometer	• Mouthpieces • Filter • Nose clips • Disinfection liquid	• Physiotherapist • Specialist medical practitioner/ PRM physician
Bronchodilators	5	-	-	• Bronchodilators • Metered dose inhaler • Spacer	• Specialist medical practitioner/ PRM physician
Supplemental oxygen	5	-	• Pulse oximeter • Oxygen concentrator	• Tube • Battery • Supplemental oxygen	• Specialist medical practitioner/ PRM physician
Airway clearance techniques	30	-	• Treatment table • Pillows • Foam rollers/wedges	• Tissues	• Physiotherapist
Target: Respiratory muscle functions					
Assessment of respiratory muscle strength	15	-	• Mouth pressure meter	• Mouthpieces • Nose clips • Disinfection liquid	• Physiotherapist • Specialist medical practitioner/ PRM physician
Respiratory muscle-strengthening exercises	20	-	• Respiratory resistance training devices • Resistance bands	• Mouthpieces • Nose clips • Disinfection liquid	• Physiotherapist
Target: Dyspnea					
Breathing control Techniques	15	-	-	-	• Nursing professional • Physiotherapist
Energy conservation techniques	15	-	-	• Activity diary	• Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	Target: Muscle power functions					
	Assessment of muscle functions	20	-	<ul style="list-style-type: none"> • Treatment table • Handheld dynamometer 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Muscle-strengthening exercises	20	-	<ul style="list-style-type: none"> • Treatment table • Weights • Resistance bands • Exercise mat 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
	Target: Mobility					
	Assessment of mobility	30	-	-	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
	Physical exercise training	30	-	<ul style="list-style-type: none"> • Exercise mat • Resistance bands • Weights • Cycle ergometer (arm or leg) 	-	<ul style="list-style-type: none"> • Physiotherapist
Exercise and fitness	Target: Exercise tolerance functions					
	Assessment of exercise capacity	30	-	<ul style="list-style-type: none"> • Timer • Cycle ergometer (arm or leg) • Heart rate monitor • Pulse oximeter • Stethoscope • Blood pressure measurement device 	-	<ul style="list-style-type: none"> • Physiotherapist • Specialist medical practitioner/ PRM physician
	Fitness training	30	-	<ul style="list-style-type: none"> • Pulse oximeter • Heart rate monitor • Blood pressure measurement device • Stethoscope • Cycle ergometer (arm or leg) • Exercise mats • Resistance bands • Weights • Exercise ball • Timer 	-	<ul style="list-style-type: none"> • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
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 bar • Ramps	• 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	• Information materials (e.g. flyers, brochures)	• Occupational therapist • Social work and counselling professional
Self-management	Target: Self-management					
	Education, advice and support for the self-management of health condition	45	-	-	• Information materials (e.g. flyers, brochures)	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Peer counsellor • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education and advice on self-directed exercises	45	-	-	• Information materials (e.g. flyers, brochures)	• 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	-	<ul style="list-style-type: none"> • Measuring tape • Scale weight 	-	<ul style="list-style-type: none"> • Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education, advice and support for healthy lifestyle (incl. smoking cessation, nutrition, physical activity)	45	-	-	<ul style="list-style-type: none"> • Information materials (e.g. flyers, brochures) 	<ul style="list-style-type: none"> • Dietitian and nutritionist • Nursing professional • Occupational therapist • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
	Target: Substance abuse					
	Referral for specialized services	5	-	-	-	<ul style="list-style-type: none"> • Specialist medical practitioner/ PRM physician

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

Interventions for the prevention and treatment of secondary conditions related to chronic obstructive pulmonary disease

	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	-	-	-	<ul style="list-style-type: none"> • Psychologist • Specialist medical practitioner/ PRM physician
	Antidepressants	5	-	-	• Antidepressants	<ul style="list-style-type: none"> • Specialist medical practitioner/ PRM physician
	Psychological therapies (incl. cognitive behavioural therapy)	60	-	-	-	<ul style="list-style-type: none"> • Psychologist
	Physical exercise training	30	-	<ul style="list-style-type: none"> • Exercise mat • Resistance bands • Weights • Cycle ergometer (arm or leg) 	-	<ul style="list-style-type: none"> • Physiotherapist
	Stress management training	30	-	-	-	<ul style="list-style-type: none"> • Psychologist
Malnutrition	Target: Malnutrition					
	Assessment of nutritional status	20	-	<ul style="list-style-type: none"> • Measuring tape • Scale weight 	-	<ul style="list-style-type: none"> • Dietitian and nutritionist • Nursing professional • Specialist medical practitioner/ PRM physician
	Nutritional management	30	-	-	• Nutritional diary	<ul style="list-style-type: none"> • Dietitian 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)
<p>Products for self-care</p> <ul style="list-style-type: none"> • Assistive products for toileting • Assistive products for dressing <p>For mobility</p> <ul style="list-style-type: none"> • Handrail/grab bar • Ramps 	<p>Specific for assessment</p> <ul style="list-style-type: none"> • Blood pressure measurement device • Handheld dynamometer • Heart rate monitor • Measuring tape • Mouth pressure meter • Pulse oximeter • Spirometer • Stethoscope • Scale weight <p>For intervention</p> <ul style="list-style-type: none"> • Assistive products for dressing • Assistive products for toileting • Utensils for activities of daily living • Treatment table • Respiratory resistance training devices • Oxygen concentrator • Foam rollers/wedges • Pillows • Resistance bands • Weights • Exercise mat • Exercise ball • Cycle ergometer (arm or leg) • Timer • Work-related tools and equipment 	<ul style="list-style-type: none"> • Battery • Disinfection liquid • Filter • Information materials (e.g. flyers, brochures) • Metered dose inhaler • Mouthpieces • Nose clips • Nutritional diary • Spacer • Tissues • Tube <p>Medicines</p> <ul style="list-style-type: none"> • Bronchodilators • Oral antidepressants • Supplemental oxygen

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation for chronic obstructive pulmonary disease (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 chronic obstructive pulmonary disease* 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.

Members of the technical working group

Catherine HOUGHTON (Nurse, Ireland); William LEVACK (Physiotherapist, New Zealand); Bernard McCARTHY (Nurse, Ireland); Betty POOT (Nurse, New Zealand); Margo SKINNER (Physiotherapist, New Zealand).

Members of the development group

Matthew BARTELS (PRM physician, USA); Soo Chin CHAN (PRM physician, Malaysia); Antoine FREMAULT (PRM physician, Belgium); Ryo KOZU (Physiotherapist, Japan); Alison LUPTON-SMITH (Physiotherapist, South Africa); Shirley NGAI (Physiotherapist, China); Nicole Maria PINTO (Physiotherapist, India); Sally SINGH (Physiotherapist, United Kingdom); Thierry TROOSTERS (Physiotherapist, Belgium); Ioannis VOGIATZIS (Exercise physiologist, Greece); Beth Ann WALKER (Occupational therapist, USA); Neelum ZEHRA BUKHARI (Occupational therapist, Pakistan).

Members of the peer review group

William CHECKLEY (Medical doctor, USA); Abderrazak HAJJIOUI (PRM physician, Morocco); Mariya JIANDANI (Physiotherapist, India); Wincelous KATAGIRA (PRM physician, Uganda); Carla MALAGUTI (Physiotherapist, Brazil); Maria PANERONI (Physiotherapist, Italy); Pralhad PRABHUDESAI (PRM physician, India); Talant SOORONBAEV (Pulmonologist, Kyrgyzstan); Marta SUPERVIA POLA (PRM physician, Spain); Savithri Wasundara WIMALASEKERA (Medical doctor, Sri Lanka).

Sarah RYLANCE (Medical officer, WHO Management-Screening, Diagnosis and Treatment of Noncommunicable Disease Unit) provided valuable feedback to the draft version of the *Package of interventions for rehabilitation for chronic obstructive pulmonary disease*.

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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 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 risk of falls, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of blood pressure functions	Blood pressure describes the pressure of the blood within the arteries, determined by the contraction of the left ventricle, the resistance of the arterioles and capillaries, the elasticity of the arterial walls, and the viscosity and volume of the blood. The assessment of blood pressure functions uses interviewing for symptoms related to impairments in blood pressure functions (e.g. dizziness) and measurement (e.g. use of analogue or digital blood pressure monitor) to determine the presence and/or severity of impairment in blood pressure functions, ascertain their impact on functioning, and inform care planning, including the need for a 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 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, and are described as inappropriate cognitive-affective responses to an anticipated or actual event or perception (e.g. pain) and impact 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 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 heart functions	Heart functions are determined by heart rate, rhythm, contraction force of ventricular muscles, and the blood supply to the heart. The assessment of heart functions (including initial screening and monitoring) uses interviewing on symptoms related to impairments in heart functions (e.g. tightness of chest, dyspnoea, dizziness), physical examination (including inspection, palpation and auscultation) and diagnostic tests (e.g. electrocardiogram, imaging, specialized cardiovascular test) to determine the presence and/or severity of impairments in heart functions, 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 of lung functions	The main function of the lungs is gas exchange. During gas exchange, oxygen from inhaled air moves from the lungs to the blood, while at the same time, carbon dioxide passes from the blood to the lungs. The assessment of lung function (including initial screening) uses interviewing for symptoms related to impairments in lung function (e.g. dyspnoea) and pulmonary function tests (e.g. spirometry) to determine the presence and/or severity of impairments of lung function, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
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	Description of the assessment
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 functions refer 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 their 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 respiratory muscle strength	Respiratory (inspiratory and expiratory) muscles comprise the thoracic respiratory muscles, the diaphragm and the accessory respiratory muscles. The strength of respiratory muscles determines the amount of thoracic movement related to inspiration and expiration, and also the force during coughing, and thus impacts the amount of gas exchange in the lungs. Assessment of respiratory muscle strength (including initial screening) uses interviewing, observation (respiratory movement), and measurement of maximal inspiratory and expiratory pressure to determine the presence and/or severity of impairments in respiratory muscle strength, 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.

3.2 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.
Airway clearance techniques	Airway clearance techniques aim to loosen mucus from airway walls through, for example, applying percussion, vibration, or other techniques, and to improve the clearance of the mucus out of the lungs through, for example, deep or huff coughing, postural or self-drainage, or using specific breathing devices. Airway clearance techniques can be combined with inhaling medications during the exercises. The clearance of the airways can help to prevent inflammation and infection of the respiratory system. The exercises are guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate techniques.
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.
Antihypertensive agents	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 control techniques	Breathing control techniques aim to control the respiratory rate (e.g. through pursed lip breathing, paced or diaphragmatic breathing) and to facilitate inhalation and exhalation (e.g. through breath-relieving positioning). The techniques can help to reduce dyspnoea in rest or during physical exertion, and also to improve the ability to relax. The exercises are guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate techniques.
Bronchodilators	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.
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 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 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.
Energy conservation techniques	Energy conservation techniques aim to reduce energy consumption during physical exertion in order to prevent dyspnoea and physical exhaustion. Energy conservation techniques comprise the planning and prioritization of day-to-day activities, adjusting the activities according to physical capacity or using equipment when necessary, and applying techniques (e.g. breathing control) during performance of activities. The energy conservation techniques are taught and guided in order to be performed self-directed following education and advice on the appropriate techniques.
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
Modification of the home environment	<p>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:</p> <ul style="list-style-type: none"> • 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.
Muscle-strengthening exercises	<p>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.</p>
Nutritional management	<p>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 appropriate diet.</p>
Physical exercise training	<p>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 needs, guided or assisted and, if feasible, performed self-directed following education and advice on the appropriate exercises.</p>
Provision and training in the use of assistive products for mobility	<p>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.</p>
Provision and training in the use of assistive products for self-care	<p>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.</p>
Psychological therapies	<p>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).</p>

Intervention	Description of the intervention
Referral for specialized services	Selecting the appropriate service, preparing relevant information and organizing the referral of the person to and requesting feedback from the required specialist services.
Respiratory muscle-strengthening exercises	Respiratory muscles play an essential role in breathing and are essential for the overall respiratory functions. Training in respiratory muscle-strengthening consists of exercises with or without equipment for inspiratory and/or expiratory muscles. Strengthening can help to reduce dyspnoea on exertion through improving, among other symptoms, breathing patterns and effort, respiratory muscle fatigue, and also the removal of secretions through effective cough. The exercises are guided or assisted by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
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.
Supplementary oxygen	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.
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 their 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. 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.

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 ischaemic heart disease			
Diann GAALEMA	Health behaviour change scientist	Research funds	Not significant
Sherry L GRACE	Psychologist; Health service scientist	Employment; research funds; non-monetary support; public position	Not significant
Vrati MEHRA	Researcher	None declared	N/A
For chronic obstructive pulmonary disease			
Catherine HOUGHTON	Nurse	None declared	N/A
William LEVACK	Physiotherapist	None declared	N/A
Bernard McCARTHY	Nurse	None declared	N/A
Betty POOT	Nurse	None declared	N/A
Margo SKINNER	Physiotherapist	Public statements and position	Not significant

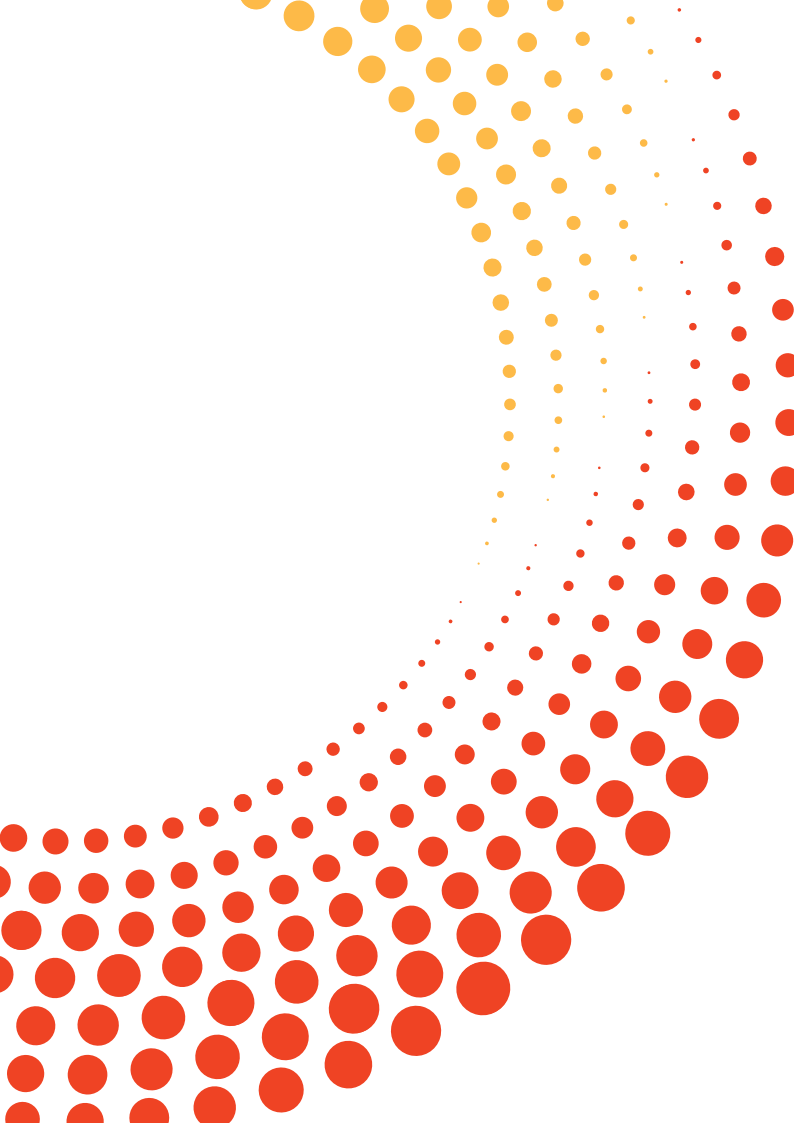
A2.2 Development group members

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For ischaemic heart disease			
Wael ALMAHED	Cardiologist	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
Abraham BABU	Physiotherapist	None declared	N/A
John BUCKLEY	Clinical exercise physiologist	Consultancy, research funds, non-monetary support, public offices, travel paid by other organization to attend this WHO meeting, intellectual property	Not significant
Ssu-Yuan CHEN	PRM physician	None declared	N/A
Jonathan GALLAGHER	Psychologist	None declared	N/A
Sherry GRACE	Psychologist; Health service scientist	Employment; research funds; non-monetary support; public position	Not significant
Martin HEINE	Occupational therapist; Movement scientist	Research funds	N/A
Hellen NAMASEMBE	Physiotherapist	None declared	N/A
Shashi OBERAI	Occupational therapist	None declared	N/A
Ronel ROOS	Physiotherapist	None declared	N/A
Masoumeh SADEGI	Cardiologist	None declared	N/A
Pamela SERÓN	Physiotherapist	None declared	N/A
Marta SUPERVIA	PRM physician	None declared	N/A
Karam TURK-ADAWI	Health/social scientist	None declared	N/A
Jamal UDDIN	Physiotherapist	Consultancy; research funds; non-monetary support,	Not significant
Tee Joo YEO	Cardiologist	None declared	N/A
For chronic obstructive pulmonary disease			
Matthew BARTELS	PRM physician	Consultancy; non-monetary support	Not significant
Soo Chin CHAN	PRM physician	None declared	N/A
Antoine FREMAULT	Medical doctor & specialist in pulmonary rehabilitation	None declared	N/A
Ryo KOZU	Physiotherapist	Non-monetary support	Not significant
Alison LUPTON-SMITH	Physiotherapist	None declared	N/A
Shirley NGAI	Physiotherapist	None declared	N/A
Nicole Maria PINTO	Physiotherapist	None declared	N/A
Sally SINGH	Physiotherapist	None declared	N/A
Thierry TROOSTERS	Physiotherapist	Research funds; public position	Not significant
Ioannis VOGIATZIS	Exercise physiologist	Research funds; public position	Not significant
Beth Ann WALKER	Occupational therapist	None declared	N/A
Neelum ZEHRA BUKHARI	Occupational therapist	Employment; consultancy	Not significant

A2.3 Peer review group members

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For ischaemic heart disease			
Aung Myat BHONE	PRM physician	None declared	N/A
Contractor AASHISH	PRM physician	None declared	N/A
Frank DOYLE	Psychologist	Research funds; intellectual property	Not significant
Sumaira FAROOQUI	Physiotherapist	Employment; consultancy	Not significant
Robyn GALLAGHER	Nurse	Consultancy	Not significant
Abderrazak HAJJIOUI	PRM physician	None declared	N/A
Mariya JIANDANI	Physiotherapist	None declared	N/A
Kushal MADAN	Physiotherapist	None declared	N/A
Carla MALAGUTI	Physiotherapist	None declared	N/A
María José OLIVEROS	Physiotherapist	None declared	N/A
Marla PANERONI	Physiotherapist	Non-monetary support	Not significant
Dawn SCANTLEBURY	Cardiologist	Public statements	Not significant
Anwar SUHAIMI	PRM physician	None declared	N/A
Neelum ZEHRA BUKHARI	Occupational therapist	Employment; consultancy	Not significant
For chronic obstructive pulmonary disease			
William CHECKLEY	Medical doctor	None declared	N/A
Abderrazak HAJJIOUI	PRM physician	None declared	N/A
Mariya JIANDANI	Physiotherapist	None declared	N/A
Winceslaus KATAGIRA	PRM physician	None declared	N/A
Carla MALAGUTI	Physiotherapist	None declared	N/A
Maria PANERONI	Physiotherapist	Non-monetary support	Not significant
Pralhad PRABHUDESAI	PRM physician	None declared	N/A
Talant SOORONBAEV	Pulmonologist	None declared	N/A
Marta SUPERVIA POLA	PRM physician	None declared	N/A
Savithri Wasundara WIMALASEKERA	Medical doctor	Research funds	Not significant



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