

Package of interventions for
Rehabilitation
Module 5
Neurodevelopmental disorders



World Health
Organization

Package of interventions for rehabilitation

Module 5 Neurodevelopmental disorders

Package of interventions for rehabilitation. Module 5. Neurodevelopmental disorders

(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 autism spectrum disorders

1.1 About autism spectrum disorders

Autism spectrum disorders constitute a diverse group of conditions related to development of the brain. They belong to developmental disorders which usually have a childhood onset, impairment, or delay in aspects of functioning related to central nervous system maturation. Autism spectrum disorders generally follow a steady course rather than present with remissions and relapses that tend to characterize many other mental disorders. Available scientific evidence suggests that there are probably many factors, including environmental and genetic, that make a child more likely to have autism (1).

Autism spectrum disorders are characterized by some degree of difficulty with social interaction and communication. Other characteristics are atypical patterns of activities and behaviours, such as difficulty transitioning from one activity to another, a focus on details, and unusual reactions to sensations. While some people with autism can live independently, others have severe limitations in functioning and require life-long care and support. Autism often impacts opportunities for education and employment. In addition, the demands on families providing care and support can be significant (1).

Role of rehabilitation in autism spectrum disorders

It is estimated that in 2019, 28.3 million people worldwide were living with autism spectrum disorders and associated problems in functioning that could benefit from rehabilitation (2). A broad range of interventions delivered in rehabilitation can optimize the development, functioning, health, well-being, and quality of life of people living with the conditions, from early childhood and across the life span. Timely access to early evidence-based interventions can improve the ability of children with autism spectrum disorders to communicate effectively and interact socially, among other skills (1). Comprehensive rehabilitation comprises sets of interventions to support children, adolescents and adults with the disorders to achieve and maintain optimal levels of functioning in everyday life, which specifically target, for example, behaviours, speech, language and communication, as well as movement functions and activities related to self-care, social interactions, education, work and participation in community life.

Target population for the Package of interventions for rehabilitation for autism spectrum disorders

This *Package of interventions of rehabilitation for autism spectrum disorders* is intended to be used for children, adolescents, and adults with autism spectrum disorders (International Classification of Diseases, 11th revision (ICD-11): 6A02 Autism spectrum disorder) with or without disorders of intellectual development.

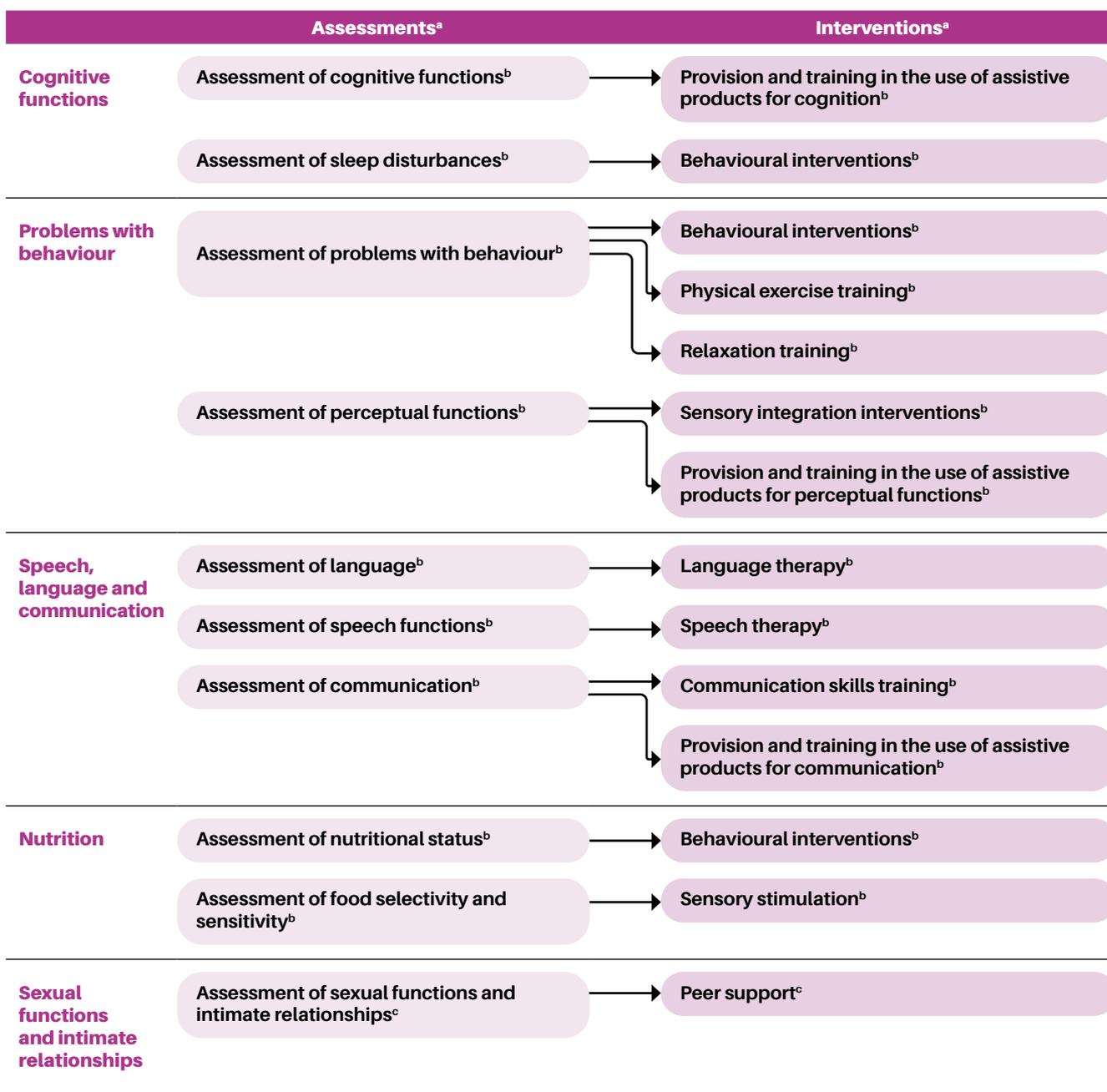
Important links to other WHO products relevant for the care of people with autism spectrum disorders:

- *mhGAP Intervention guide for mental, neurological and substance use disorders - version 2.0 (3).*
- *WHO eLearning caregiver skills training for families of children with developmental delays or disabilities (4).*

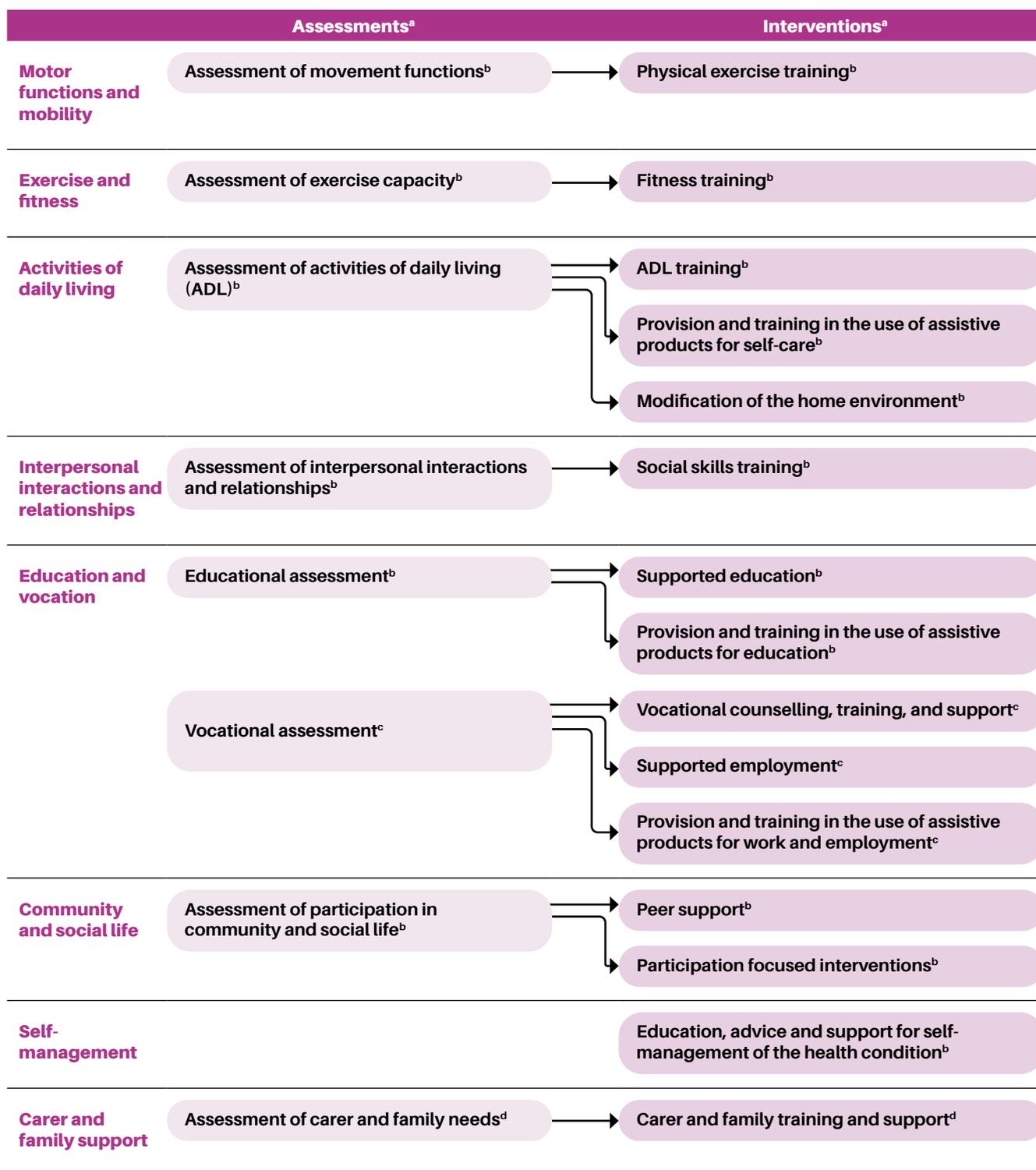
1.2 Content of the Package of interventions for rehabilitation for autism spectrum disorders

Overview of the interventions for rehabilitation in autism spectrum disorders

Functioning interventions



[cont.]



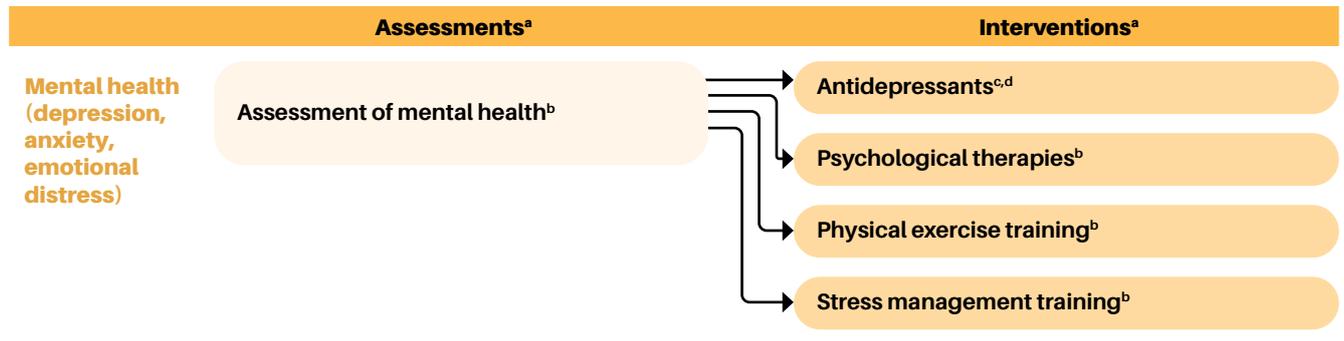
^a See Annex 1 for definitions of assessments and interventions.

^b Children, adolescents, and adults with autism spectrum disorders.

^c Adolescents and adults with autism spectrum disorders.

^d Families and carers of individuals with autism spectrum disorders.

Interventions for the prevention and treatment of secondary conditions related to autism spectrum disorder



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

^b Children, adolescents, and adults with autism spectrum disorders.

^c Adolescents and adults with autism spectrum disorders and moderate to severe depression.

^d Medicines are included in WHO Model List of Essential Medicines (5).

Overview of the resources required for rehabilitation in autism spectrum disorders

Functioning interventions

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Mental/cognitive functions	Target: Cognitive functions					
	Assessment of cognitive functions	60	-	<ul style="list-style-type: none"> • Computer/tablets with software • Cognitive test equipment • Timer 	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist • Specialist medical practitioner/ PRM physician
	Provision and training in the use of assistive products for cognition	30	<ul style="list-style-type: none"> • Pill organizers • Time management products • Global positioning system (GPS) locators • Simplified mobile phones • Personal emergency alarm system 	-	-	<ul style="list-style-type: none"> • Nursing professional • Occupational therapist
	Target: Sleep functions					
	Assessment of sleep disturbances	15	-	-	-	<ul style="list-style-type: none"> • Psychologist • Specialist medical practitioner/ PRM physician
	Behavioural interventions	45	<ul style="list-style-type: none"> • Time management products 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist
Behaviour	Target: Problems with behaviour					
	Assessment of problems with behaviour	60	-	<ul style="list-style-type: none"> • Timer • Toys • Visual cues or supports 	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist • Specialist medical practitioner/ PRM physician
	Behavioural interventions	45	-	<ul style="list-style-type: none"> • Toys • Timer • Visual cues or supports 	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Physical exercise training	30	-	<ul style="list-style-type: none"> • Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg) 	-	<ul style="list-style-type: none"> • Physiotherapist
Relaxation training	30	-	<ul style="list-style-type: none"> • Exercise mats • Pillow • Foam rollers/wedges 	<ul style="list-style-type: none"> • Information materials (e.g. flyers, brochures) 	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist • Psychologist
Target: Perceptual functions					
Assessment of perceptual functions	20	-	<ul style="list-style-type: none"> • Sensory processing test equipment • Exercise ball • Exercise mats • Toys • Swing • Balance board • Utensils for activities of daily living 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
Sensory integration interventions	30	-	<ul style="list-style-type: none"> • Exercise ball • Exercise mats • Toys • Swing • Balance board • Mirror 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
Provision and training in the use of assistive products for perceptual functions	30	<ul style="list-style-type: none"> • Spectacles; filters and protection 		-	<ul style="list-style-type: none"> • Occupational therapist

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Target: Cognitive functions of language					
Assessment of language	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/ books/ cards • Timer • Reading materials and pictures • Everyday objects/toys 	-	<ul style="list-style-type: none"> • Specialist medical practitioner/ PRM physician • Speech and language therapist/pathologist
Language therapy	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/ books/ cards • Timer • Reading materials and pictures • Everyday objects/(sound-making) toys 	-	<ul style="list-style-type: none"> • Speech and language therapist/pathologist
Target: Speech functions					
Assessment of speech functions	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Recorders (video and audio) • Timer • Mirror • Reading materials and pictures • Everyday objects/toys 	<ul style="list-style-type: none"> • Gloves • Straws • Tongue depressor • Tissues • Face masks 	<ul style="list-style-type: none"> • Specialist medical practitioner/ PRM physician • Speech and language therapist/pathologist
Speech therapy	45	-	<ul style="list-style-type: none"> • Communication boards/books/ cards • Simplified mobile phones • Communication software • Recorders • Reading materials and pictures • Toys • Timer • Mirror • Metronome 	<ul style="list-style-type: none"> • Gloves • Straws • Tongue depressor • Tissues • Face masks 	<ul style="list-style-type: none"> • Speech and language therapist/pathologist

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Target: Communication					
Assessment of communication	30	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/books/cards • Recorders (video and audio) • Reading materials and pictures • (Sound-making) toys • Pointers 	-	<ul style="list-style-type: none"> • Speech and language therapist/pathologist • Occupational therapist • Psychologist
Communication skills training	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/books/cards • Recorders (video and audio) • Simplified mobile phones • Reading materials and pictures, toys • Whiteboard • Pointers 	-	<ul style="list-style-type: none"> • Occupational therapist • Speech and language therapist/pathologist
Provision and training in the use of assistive products for communication	45	<ul style="list-style-type: none"> • Communication boards/books/cards • Communication software 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Speech and language therapist/pathologist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Nutrition	Target: Nutrition					
	Assessment of nutritional status	20	-	<ul style="list-style-type: none"> Scale weight (wheelchair accessible) Measuring tape 	-	<ul style="list-style-type: none"> Dietitian and nutritionist Nursing professional Specialist medical practitioner/ PRM physician
	Assessment of food selectivity and sensitivity	30	-	<ul style="list-style-type: none"> (Adapted) eating and drinking products 	<ul style="list-style-type: none"> Food/drink with different consistencies and taste 	<ul style="list-style-type: none"> Dietitian and nutritionist Occupational therapist Specialist medical practitioner/ PRM physician
	Behavioural interventions	45	-	-	-	<ul style="list-style-type: none"> Occupational therapist Psychologist
	Sensory stimulation	20	-	<ul style="list-style-type: none"> (Adapted) eating and drinking products 	<ul style="list-style-type: none"> Food/drink with different consistencies and taste 	<ul style="list-style-type: none"> Dietitian and nutritionist Occupational therapist
Sexual functions and intimate relationships	Target: Sexual functions and intimate relationships					
	Assessment of sexual functions and intimate relationships	45	-	-	-	<ul style="list-style-type: none"> Psychologist Specialist medical practitioner/ PRM physician
	Peer support	45	-	-	<ul style="list-style-type: none"> Information materials (e.g. flyers, brochures) 	<ul style="list-style-type: none"> Peer counsellor

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Motor functions and mobility	Target: Movement functions (incl. voluntary and involuntary movement functions, gait)					
	Assessment of movement functions	30	-	<ul style="list-style-type: none"> • Timer • Measuring tape 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
	Physical exercise training	30	-	<ul style="list-style-type: none"> • Timer • Exercise mats • 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 	-	<ul style="list-style-type: none"> • Physiotherapist • Specialist medical practitioner/ PRM physician
	Fitness training	30	-	<ul style="list-style-type: none"> • Cycle ergometer (arm or leg) • Exercise mat • Resistance bands • Weights • Exercise ball • Timer 	-	<ul style="list-style-type: none"> • Physiotherapist
Activities of daily living	Target: Activities of daily living (ADL)					
	Assessment of ADL	30	-	<ul style="list-style-type: none"> • Timer • Cycle ergometer (arm or leg) • Heart rate monitor 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
	ADL training	30	-	<ul style="list-style-type: none"> • Utensils for activities of daily living • Assistive products for toileting • Adapted eating and drinking products • Assistive products for washing and dressing 	-	<ul style="list-style-type: none"> • 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 self-care	30	<ul style="list-style-type: none"> Assistive products for toileting Adapted eating and drinking products Assistive products for washing and dressing 	-	-	<ul style="list-style-type: none"> Occupational therapist Physiotherapist
	Modification of the home environment	60	-	<ul style="list-style-type: none"> Measuring tape 	-	<ul style="list-style-type: none"> Occupational therapist Physiotherapist
Interpersonal interactions and relationships	Target: Interpersonal interactions and relationships					
	Assessment of interpersonal interactions and relationships	30	-	-	-	<ul style="list-style-type: none"> Occupational therapist Psychologist Specialist medical practitioner/ PRM physician
	Social skills training	30	-	-	-	<ul style="list-style-type: none"> Occupational therapist Psychologist
Education and vocation	Target: Education					
	Educational assessment	60	-	<ul style="list-style-type: none"> School-related tools and equipment 	-	<ul style="list-style-type: none"> Occupational therapist Social work and counselling professional Special educator Speech and language therapist/pathologist
	Supported education	60	-	<ul style="list-style-type: none"> Visual cues or supports Computer/tablets with software Educational materials 	-	<ul style="list-style-type: none"> Occupational therapist Social work and counselling professional Special educator Speech and language therapist/pathologist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Education and vocation	Provision and training in the use of assistive products for education	30	• Assistive products for educational activities	-	-	• Occupational therapist • Special educator • Speech and language therapist/pathologist
	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
	Supported employment	60	-	• Visual cues or supports	• Information materials (e.g. flyers, brochures)	• Occupational therapist • Psychologist • Social work and counselling professional
Community and social life	Provision and training in the use of assistive products for work and employment	30	• Assistive products to adapt workstation	-	-	• Occupational therapist • Physiotherapist
	Target: Participation in community and social life					
	Assessment of participation in community and social life	20	-	-	-	• Occupational therapist • Social work and counselling professional
	Peer support	45	-	-	-	• Peer counsellor
	Participation focused interventions	60	-	• Equipment for sport, recreational and leisure activities	-	• Occupational therapist • Physiotherapist • 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 the self-management of the health condition (incl. education on sexuality and intimate relationships;	45	-	-	• Information materials (e.g. flyers, brochures)	• Dietitian and nutritionist • Nursing professional • Occupational therapist • Peer counsellor • 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 autism spectrum disorders

	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	• Specialist medical practitioner/ PRM physician
	Psychological therapies (incl. cognitive behavioural therapy)	60	-	-	-	• Psychologist
	Physical exercise training	30	-	<ul style="list-style-type: none"> • 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)
<p>Products for cognition</p> <ul style="list-style-type: none"> • Global positioning system (GPS) locators • Personal emergency alarm systems (PDA) • Pill organizer • Simplified mobile phones • Time management products <p>Products for communication</p> <ul style="list-style-type: none"> • Communication boards/books/cards • Electronic device and communication software <p>Products for self-care</p> <ul style="list-style-type: none"> • Adapted eating and drinking products • Assistive products for toileting • Assistive products for washing and dressing <p>Products for vision</p> <ul style="list-style-type: none"> • Spectacles; filters and protection <p>Others</p> <ul style="list-style-type: none"> • Assistive products for educational activities • Assistive products to adapt workstation 	<p>Specific for assessment</p> <ul style="list-style-type: none"> • Cognitive test equipment • Heart rate monitor • Measuring tape • Sensory processing test equipment • Scale weight (wheelchair accessible) <p>For intervention</p> <ul style="list-style-type: none"> • Communication boards/books/cards • Communication software • Computer/tablets with software • Metronome • Reading materials and pictures • Recorders • Pointers • Simplified mobile phones • White board • Visual cues or supports • (Adapted) eating and drinking products • Assistive products for washing and dressing • Assistive products for toileting • Utensils for activities of daily living • Everyday objects • Toys • Foam rollers/wedges • Pillow • Exercise mat • Resistance bands • Weights • Exercise ball • Swing • Balance board • Mirror • Cycle ergometer (arm or leg) • Timer • Educational materials • School-related tools and equipment • Work-related tools and equipment 	<ul style="list-style-type: none"> • Face masks • Food/drink with different consistencies and taste • Gloves • Information materials (e.g. flyers, brochures) • Straws • Tissues • Tongue depressor <p>Medicines</p> <ul style="list-style-type: none"> • Antidepressants

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation in disorders of intellectual development (in alphabetical order)

- Dietitians and nutritionists
- Nursing professionals
- Occupational therapists
- Physiotherapists
- Psychologists
- Social work and counselling professionals
- Special educators
- Specialist medical practitioners/PRM physicians
- Speech and language therapists/pathologists

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 autism spectrum disorders* 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

Abigail DELEHANTY (Speech and language pathologist, United States of America (USA)); Jessica HOOKER (Speech and language pathologist, USA); Audrey THURM (Psychologist, USA); Amy WETHERBY (Speech and language pathologist, USA); Jordan WICKSTROM (Biomechanist, USA).

Members of the development group

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Members of the peer review group

Peter CARPENTER (Psychiatrist, United Kingdom of Great Britain and Northern Ireland); Maria del Carmen D'ASTOLFO (Consumer representative, Argentina); Nelisiwe Elizabeth DUNGE (Educational specialist, Educational psychologist, South Africa); Pragashnie GOVENDER (Occupational therapist, South Africa); Deana HERRMAN (Physiotherapist, USA); Rosa HOEKSTRA (Researcher, Netherlands (Kingdom of the)); Angelique KESTER (Occupational therapist, Netherlands (Kingdom of the)); Giwon KIM (Physiotherapist, Republic of Korea); Rafael MARTINEZ LEAL (Psychologist, Spain); Meg McQUEEN (Occupational therapist, Canada); Carlos PENA SALAZAR (Psychiatrist, Neurologist, Spain); Marina SALVARA (Physiotherapist and Physical educator, Greece); Maria Luisa SCATTONI (Researcher, Italy); Antti TEITTINEN (Sociologist/Researcher, Finland); Susan WAMITHI (Developmental paediatrician, Kenya).

Chiara SERVILI and Vanessa CAVALLERA (WHO technical officers, Brain Health Unit, WHO Mental Health and Substance Use Department) provided valuable support and feedback along the development of the *Package of interventions for rehabilitation for autism spectrum disorders*.

1.4 References

1. Autism. Geneva: World Health Organization; 2023 (<https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders>, accessed June 2023).
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3. mhGAP Intervention guide for mental, neurological and substance use disorders – version 2.0. Geneva: World health Organization; 2016 (<https://apps.who.int/iris/handle/10665/250239>, accessed December 2022).
4. WHO eLearning caregiver skills training for families of children with developmental delays or disabilities. Geneva: World Health Organization; 2022 (<https://openwho.org/courses/caregiver-skills-training>, accessed December 2022).
5. WHO Model List of Essential Medicines. Geneva: World Health Organization; 2021 (<https://apps.who.int/iris/handle/10665/345533>, accessed December 2022).

2 Package of interventions for rehabilitation for disorders of intellectual development

2.1 About disorders of intellectual development

Disorders of intellectual development belong to developmental disorders that usually have a childhood onset, impairment, or delay in aspects of functioning related to central nervous system maturation. Disorders of intellectual development follow a steady course rather than present with the remissions and relapses that tend to characterize many other mental disorders. The disorders are characterized by significant limitations in intellectual functioning and adaptive behaviour, which refer to difficulties with everyday conceptual, social, and practical skills that are performed in daily life (1).

Disorders of intellectual development may affect a person's ability to learn new information, communicate, and solve problems effectively; thus the person with the disorder often experiences problems in coping and living independently. Furthermore, having an intellectual disability can create stress and vulnerability for both the person and their support network. People with an intellectual disability may also experience higher rates of abuse compared to the general population (2).

Role of rehabilitation in disorders of intellectual development

It is estimated that in 2019, 137 million people worldwide were living with disorders of intellectual development and associated problems in functioning that could benefit from rehabilitation (3). Rehabilitation is an important element of multidisciplinary care and support services, helping people with the disorders to acquire skills and confidence, to minimize impairments, to improve activities in daily living, and to be engaged in meaningful educational, work-related, and social activities, and thus to gain autonomy and independence (4). Specific interventions for rehabilitation in disorders of intellectual development target, among other skills, cognitive functions, speech, communication and social interaction, movement, activities of daily living, and education and vocation. Rehabilitation also provides support and training for the carers and families.

Target population for the Package of interventions for rehabilitation for disorders of intellectual development

This *Package of interventions of rehabilitation for disorders of intellectual development* is intended to be used for children, adolescents, and adults with disorders of intellectual development originating during the developmental period (ICD-11: 6A00 Disorders of intellectual development).

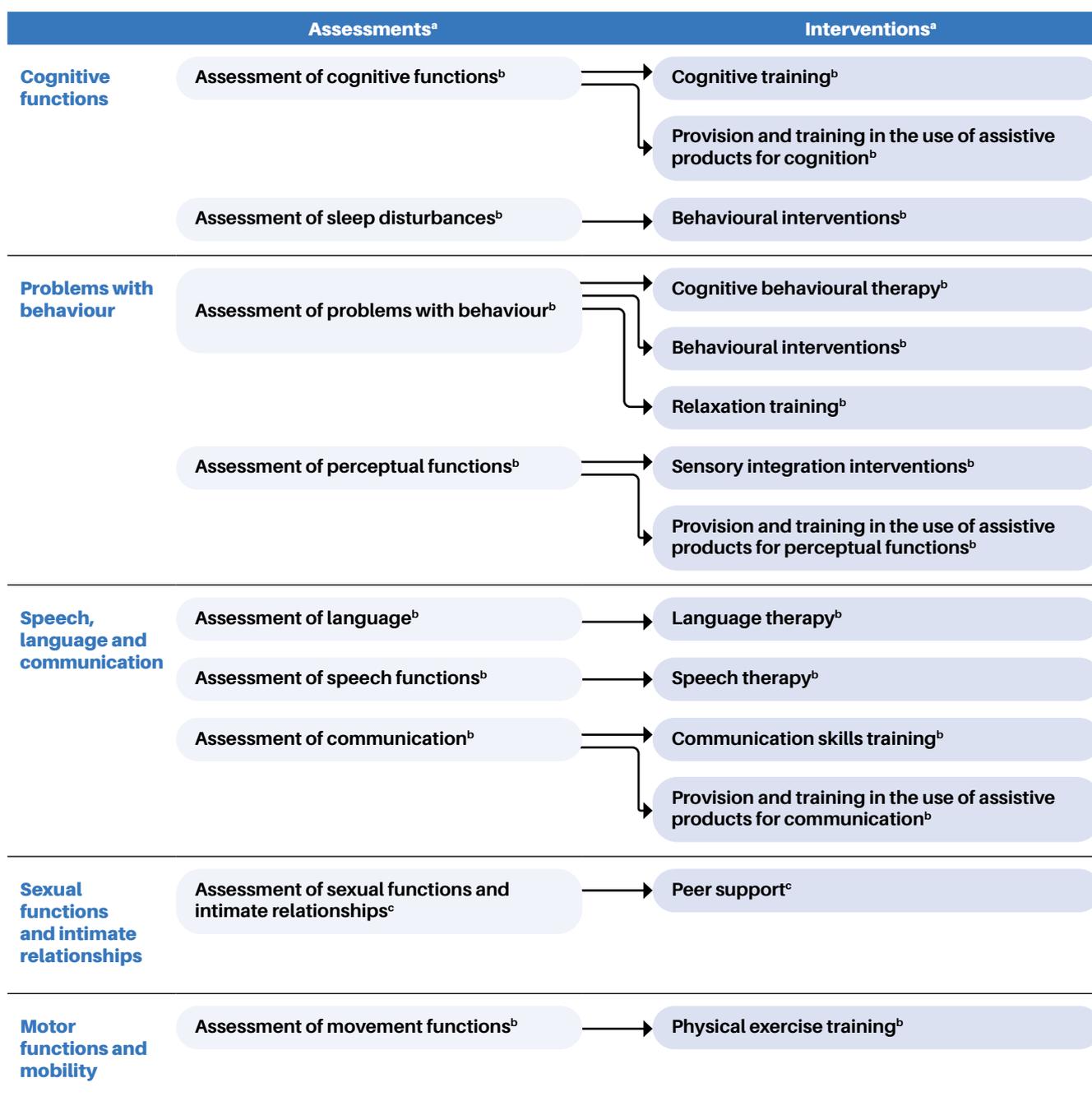
Important links to other WHO products relevant for the care of people with disorders of intellectual development:

- *mhGAP Intervention guide for mental, neurological and substance use disorders - version 2.0 (5).*
- *WHO eLearning caregiver skills training for families of children with developmental delays or disabilities (6).*

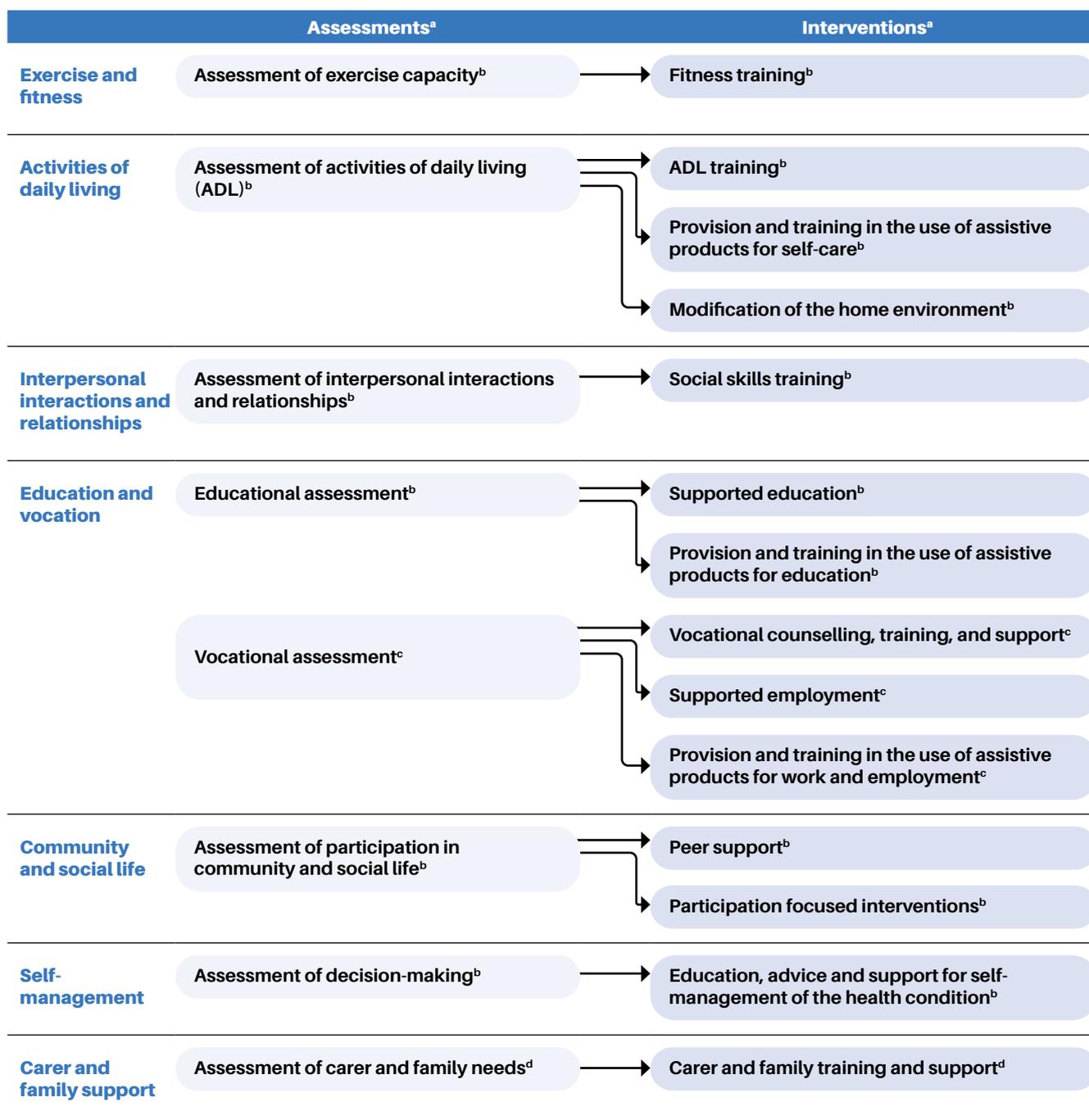
2.2 Content of the Package of interventions for rehabilitation for disorders of intellectual development

Overview of the interventions for rehabilitation in disorders of intellectual development

Functioning interventions



[cont.]



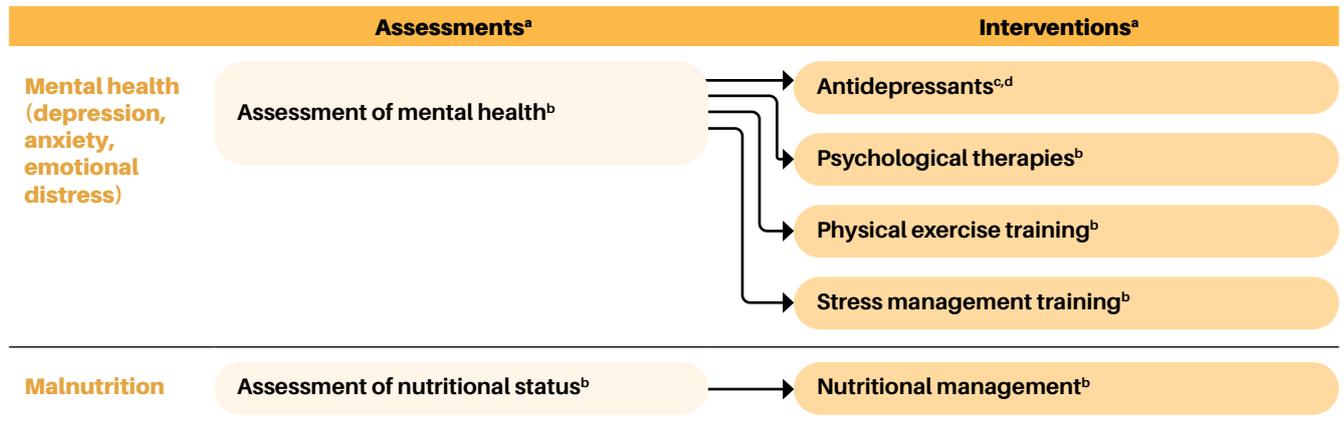
^a See Annex 1 for definitions of assessments and interventions.

^b Children, adolescents, and adults with disorders of intellectual development.

^c Adolescents and adults with disorders of intellectual development.

^d Families and carers of individuals with disorders of intellectual development.

Interventions for the prevention and treatment of secondary conditions related to disorders of intellectual development



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

^b Children, adolescents, and adults with disorders of intellectual development.

^c Adolescents and adults with disorders of intellectual development and moderate to severe depression.

^d Medicines are included in WHO Model List of Essential Medicines (7).

Overview of the resources required for rehabilitation in disorders of intellectual development

Functioning interventions

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Target: Cognitive functions					
Assessment of cognitive functions	60	-	<ul style="list-style-type: none"> • Computer/tablets with software • Cognitive test equipment • Timer 	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist • Specialist medical practitioner/ PRM physician
Cognitive training	30	-	<ul style="list-style-type: none"> • Computer/tablets with software • Workbooks • Everyday objects • Timer 	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist
Provision and training in the use of assistive products for cognition	30	<ul style="list-style-type: none"> • Recorders • Simplified mobile phones • Personal emergency alarm systems (PDA) • Memory aids • Pill organizers • Time management products 	-	-	<ul style="list-style-type: none"> • Nursing professional • Occupational therapist
Target: Sleep functions					
Assessment of sleep disturbances	15	-	-	-	<ul style="list-style-type: none"> • Psychologist • Specialist medical practitioner/ PRM physician
Behavioural interventions	45	<ul style="list-style-type: none"> • Time management products 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Target: Problems with behaviour					
Assessment of problems with behaviour	60	-	<ul style="list-style-type: none"> • Timer • Toys • Visual cues or supports 	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist • Specialist medical practitioner/ PRM physician
Cognitive behavioural therapy	60	-	-	-	<ul style="list-style-type: none"> • Psychologist
Behavioural interventions	45	-	<ul style="list-style-type: none"> • Visual cues or supports • Educational materials • Toys 	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist
Relaxation training	30	-	<ul style="list-style-type: none"> • Exercise mat • Pillow • Foam rollers/wedges 	-	<ul style="list-style-type: none"> • Psychologist • Occupational therapist • Physiotherapist
Target: Perceptual functions					
Assessment of perceptual functions	20	-	<ul style="list-style-type: none"> • Sensory processing test equipment • Exercise ball • Exercise mat • Toys • Swing • Balance board • Utensils for activities of daily living 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist • Specialist medical practitioner/ PRM physician
Sensory integration interventions	30	-	<ul style="list-style-type: none"> • Exercise ball • Exercise mat • Toys • Swing • Balance board • Mirror 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
Provision and training in the use of assistive products for perceptual functions	30	<ul style="list-style-type: none"> • Spectacles; filters and protection 	-	-	<ul style="list-style-type: none"> • Occupational therapist

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Target: Cognitive functions of language					
Assessment of language	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/ books/ cards • Timer • Reading materials and pictures • Everyday objects/toys 	-	<ul style="list-style-type: none"> • Speech and language therapist/pathologist • Specialist medical practitioner/ PRM physician
Language therapy	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/books/ cards • Timer • Reading materials and pictures • Everyday objects/(sound-making) toys 	-	<ul style="list-style-type: none"> • Speech and language therapist/pathologist
Target: Speech functions					
Assessment of speech functions	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Recorders (video and audio) • Timer • Mirror • Reading materials and pictures • Everyday objects/toys 	<ul style="list-style-type: none"> • Gloves • Straws • Tongue depressor • Tissues • Face masks 	<ul style="list-style-type: none"> • Speech and language therapist/pathologist • Specialist medical practitioner/ PRM physician
Speech therapy	45	-	<ul style="list-style-type: none"> • Communication boards/books/ cards • Simplified mobile phones • Communication software • Recorders • Reading materials and pictures • Toys • Timer • Mirror • Metronome 	<ul style="list-style-type: none"> • Gloves • Straws • Tongue depressor • Tissues • Face masks 	<ul style="list-style-type: none"> • Speech and language therapist/pathologist

Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
		Assistive products	Equipment	Consumables	
Target: Communication					
Assessment of communication	30	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/books/cards • Recorders (video and audio) • Reading materials and pictures • (Sound-making) toys • Pointers 	-	<ul style="list-style-type: none"> • Occupational therapist • Speech and language therapist/pathologist
Communication skills training	45	-	<ul style="list-style-type: none"> • Computer/tablets with (communication) software • Communication boards/books/cards • Recorders (video and audio) • Simplified mobile phones • Reading materials and pictures, toys • Whiteboard • Pointers 	-	<ul style="list-style-type: none"> • Occupational therapist • Speech and language therapist/pathologist
Provision and training in the use of assistive products for communication	45	<ul style="list-style-type: none"> • Communication boards/books/cards • Simplified mobile phones • Communication software • Recorders 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Speech and language therapist/pathologist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Sexual functions and intimate relationships	Target: Sexual functions and intimate relationships					
	Assessment of sexual functions and intimate relationships	45	-	-	-	<ul style="list-style-type: none"> • Psychologist • Specialist medical practitioner/ PRM physician
	Peer support	45	-	-	<ul style="list-style-type: none"> • Information materials (e.g. flyers, brochures) 	<ul style="list-style-type: none"> • Peer counsellor
Motor functions and mobility	Target: Movement functions					
	Assessment of movement functions	30	-	<ul style="list-style-type: none"> • Timer • Measuring tape 	-	<ul style="list-style-type: none"> • Physiotherapist • Occupational therapist • Specialist medical practitioner/ PRM physician
	Physical exercise training	30	-	<ul style="list-style-type: none"> • Timer • Exercise mats • Resistance bands • Weights • Cycle ergometer (arm or leg) 	-	<ul style="list-style-type: none"> • 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	-	<ul style="list-style-type: none"> • Timer • Cycle ergometer (arm or leg) • Heart rate monitor 	-	<ul style="list-style-type: none"> • Physiotherapist • Specialist medical practitioner/ PRM physician
	Fitness training	30	-	<ul style="list-style-type: none"> • Cycle ergometer (arm or leg) • Exercise mat • Resistance bands • Weights • Exercise ball • Timer 	-	<ul style="list-style-type: none"> • Physiotherapist
Activities of daily living	Target: Activities of daily living (ADL)					
	Assessment of ADL	30	-	<ul style="list-style-type: none"> • Utensils for activities of daily living 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
	ADL training	30	-	<ul style="list-style-type: none"> • Utensils for activities of daily living • Assistive products for toileting • Adapted eating and drinking products • Assistive products for washing and dressing 	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
	Provision and training in the use of assistive products for self-care	30	<ul style="list-style-type: none"> • Assistive products for toileting • Adapted eating and drinking products • Assistive products for washing and dressing 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist
	Modification of the home environment	60	<ul style="list-style-type: none"> • Adapted lighting 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Physiotherapist

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Interpersonal interactions and relationships	Target of interventions: Interpersonal interactions and relationships					
	Assessment of interpersonal interactions and relationships	30	-	-	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist • Specialist medical practitioner/ PRM physician
	Social skills training	30	-	-	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist
Education and vocation	Target of interventions: Education					
	Educational assessment	60	-	<ul style="list-style-type: none"> • School-related tools and equipment 	-	<ul style="list-style-type: none"> • Occupational therapist • Social work and counselling professional • Special educator • Speech and language therapist/pathologist
	Supported education	60	-	<ul style="list-style-type: none"> • Visual cues or supports • Computer/tablets with software • Educational materials 	-	<ul style="list-style-type: none"> • Occupational therapist • Social work and counselling professional • Special educator • Speech and language therapist/pathologist
	Provision and training in the use of assistive products for education	30	<ul style="list-style-type: none"> • Assistive products for educational activities 	-	-	<ul style="list-style-type: none"> • Occupational therapist • Speech and language therapist/pathologist • Special educator

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Education and vocation	Target of interventions: 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
	Supported employment	60	-	• Visual cues or supports	• Information materials (e.g. flyers, brochures)	• Occupational therapist • Psychologist • Social work and counselling professional
	Provision and training in the use of assistive products for work	30	• Assistive products to adapt workstation	-	-	• Occupational therapist • Physiotherapist
Community and social life	Target of interventions: Participation in community and social life					
	Assessment of participation in community and social life	20	-	-	-	• Occupational therapist • Social work and counselling professional
	Peer support	45	-	-	-	• Peer counsellor
	Participation focused interventions	60	-	• Equipment for sport and recreational activities	-	• Occupational therapist • Physiotherapist • Social work and counselling professional

	Intervention	Session time (mins)	Material resources			Occupations (rehabilitation specialists)
			Assistive products	Equipment	Consumables	
Self-management	Target of interventions: Self-management					
	Assessment of decision making	60	-	-	-	<ul style="list-style-type: none"> • Occupational therapist • Psychologist • Specialist medical practitioner/ PRM physician
	Education, advice and support for self-management of the health condition	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 • Peer counsellor • Physiotherapist • Psychologist • Specialist medical practitioner/ PRM physician
Carer and family support	Target of interventions: Carer and family 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 • 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 disorders of intellectual development

	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"> • Timer • Exercise mats • 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: Prevention of malnutrition					
	Assessment of nutritional status	20	-	<ul style="list-style-type: none"> • Scale weight (wheelchair accessible) • Measuring tape 	-	<ul style="list-style-type: none"> • Dietitian and nutritionist • Nursing professional • Specialist medical practitioner/ PRM physician
	Nutritional management	30	-	-	• Information materials (e.g. flyers, brochures)	<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 cognition</p> <ul style="list-style-type: none"> • Memory aids • Personal emergency alarm systems (PDA) • Pill organizers • Recorders • Simplified mobile phones • Time management products <p>Products for self-care</p> <ul style="list-style-type: none"> • Adapted eating and drinking products • Assistive products for toileting • Assistive products for washing and dressing <p>Products for communication</p> <ul style="list-style-type: none"> • Communication boards/books/cards • Communication software <p>Products for vision</p> <ul style="list-style-type: none"> • Spectacles; filters and protection <p>Others</p> <ul style="list-style-type: none"> • Adapted lighting • Assistive products for educational activities • Assistive products to adapt workstation 	<p>Specific for assessment</p> <ul style="list-style-type: none"> • Cognitive test equipment • Heart rate monitor • Measuring tape • Sensory processing test equipment • Scale weight (wheelchair accessible) <p>For intervention</p> <ul style="list-style-type: none"> • Communication boards/books/cards • Communication software • Computer/tablets with software • Metronome • Reading materials and pictures • Recorders • Simplified mobile phones • Visual cues or supports • White board • Pointers • Utensils for activities of daily living • Assistive products for toileting • Adapted eating and drinking products • Assistive products for washing and dressing • Everyday objects • Toys • Foam rollers/wedges • Pillow • Exercise mat • Resistance bands • Weights • Exercise ball • Balance board • Swing • Mirror • Cycle ergometer (arm or leg) • Timer • Educational materials • Equipment for sport and recreational activities • School-related tools and equipment • Work-related tools and equipment • Workbooks 	<ul style="list-style-type: none"> • Information materials (e.g. flyers, brochures) • Gloves • Straws • Tongue depressor • Tissues • Face masks <p>Medicines</p> <ul style="list-style-type: none"> • Antidepressants

Workforce

Overview of rehabilitation specialists qualified to deliver interventions for rehabilitation in disorders of intellectual development (in alphabetical order)

- Dietitians and nutritionists
- Nursing professionals
- Occupational therapists
- Physiotherapists
- Psychologists
- Social work and counselling professionals
- Special educators
- Specialist medical practitioners/PRM physicians
- Speech and language therapists/pathologists

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 disorders of intellectual development* 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

Somer BISHOP (Psychologist, USA); Kristin DELL'ARMO (Psychologist, USA); Emma SALZMAN (Psychologist, USA); Marc TASSÉ (Psychologist, USA); Audrey THURM (Psychologist, USA); Jordan WICKSTROM (Biomechanist, USA).

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Members of the peer review group

Peter CARPENTER (Psychiatrist, United Kingdom); Maria del Carmen D'ASTOLFO (Consumer representative, Argentina); Nelisiwe Elizabeth DUNGE (Educational specialist, Educational psychologist, South Africa); Pragashnie GOVENDER (Occupational therapist, South Africa); Deana HERRMAN (Physiotherapist, USA); Rosa HOEKSTRA (Researcher, Netherlands (Kingdom of the)); Angelique KESTER (Occupational therapist, Netherlands (Kingdom of the)); Giwon KIM (Physiotherapist, Republic of Korea); Rafael MARTINEZ LEAL (Psychologist, Spain); Meg McQUEEN (Occupational therapist, Canada); Carlos PENA SALAZAR (Psychiatrist, Neurologist, Spain); Marina SALVARA (Physiotherapist and Physical educator, Greece); Maria Luisa SCATTONI (Researcher, Italy); Antti TEITTINEN (Sociologist/Researcher, Finland); Susan WAMITHI (Developmental paediatrician, Kenya).

Chiara SERVILI and Vanessa CAVALLERA (WHO technical officers, Brain Health Unit, WHO Mental Health and Substance Use Department) provided valuable support and feedback along the development of the *Package of interventions for rehabilitation for disorders of intellectual development*.

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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 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 of cognitive functions	Cognitive functions comprise mental functions such as consciousness, orientation, attention, memory, sensory perception, language, abstraction, organization, planning, insight, judgment, calculation and problem-solving. The assessment of cognitive functions (including initial screening to determine the need for comprehensive assessment) uses observation, interviewing, standardized self-reported questionnaires or standardized cognitive tests to determine the presence and/or severity of impairment in mental functions, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of communication	Communication is performed by using words, sounds, signs or behaviours to express or exchange information and is learned from early childhood. Difficulties in communication can relate to problems with understanding and expressing language, impairments in hearing, speech or vocal functions, and also to psychological issues. The assessment of communication (including initial screening to determine the need for comprehensive assessment) uses observation, interviewing, standardized self-reported questionnaires or communication tests to determine the presence and/or severity of impairment in communication functions, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of decision-making	The capacity to make decision allows people to make a choice among options, implementing the choice, and evaluating the effects of the choice (e.g. selecting and purchasing a specific item) and is essential in self-management. The assessment of decision making uses observation, interviewing or standardized questionnaires and tests to determine the presence and/or severity of problems with decision-making, ascertain their impact on functioning, including the need for referral or follow-up.

Assessment	Description of the assessment
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 food selectivity and sensitivity	Food selectivity and sensitivity can be described as a combination of food refusal, limited food repertoire and high frequency single food intake, and can lead to nutrient deficiencies and malnutrition. Assessment of food selectivity and sensitivity (including initial screening to determine the need for comprehensive assessment) uses observation, interviewing and standardized self-reported questionnaires to determine the presence and/or severity of problems with food intake related to food selectivity and sensitivity, 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 the specific situation of the individual and the people who relate to the individual. Assessment (including initial screening) can be conducted by observation, interviewing or using standardized self-reported questionnaires.
Assessment of language	The use of language involves the capacity to understand and express spoken, written or other forms of language. This capacity is developed in the early ages of development. Problems with using language include, among other factors, the lack of development of oral language due to hearing loss, for example, but also different types of impairments due to brain damage (e.g. aphasia). Assessment of language (including initial screening to determine the need for comprehensive assessment) uses observation, interviewing, standardized self-reported questionnaires or standardized tests to determine the presence and/or severity of problems with using language, 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 of movement functions	Movement functions comprise functions such as motor reflex functions, voluntary and involuntary movement functions or gait pattern. The assessment of movement functions (including initial screening to determine the need for comprehensive assessment) uses observation, physical examination and standardized tests to determine the presence and/or severity of impairments in movement functions, ascertain their impact on functioning, and inform care planning, including the need for a 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	Description of the assessment
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 of perceptual functions	Perceptual functions are the specific mental functions of recognizing, processing and interpreting sensory stimuli; they cover auditory, visual, olfactory, gustatory, tactile and visuospatial perception. Impairments in sensory perception and processing can impact vision, hearing or movement, and can also contribute to problems with behaviour. Assessment of perceptual functions uses interviewing, observation or clinical tests to determine the presence and/or severity of impairment in perceptual functions, ascertain their impact on functioning, and inform care planning, including the need for a referral or follow-up.
Assessment of problems with behaviour	Problems with behaviour (also called “challenging”, “problematic”, or “inappropriate” behaviours, or “behavioural and psychological symptoms”) comprise symptoms such as, for example, agitation, aggression, inattention, or overactivity. Problems with behaviour can be caused or triggered by factors that are biological (e.g. pain), social (e.g. boredom, insensitivity of others), environmental (e.g. noise and lighting) or psychological (e.g. emotional problems) which may endanger the physical safety of the person or others, limit interpersonal interactions or deny access to community facilities. The assessment of problems with behaviour uses interviewing, observation and standardized instruments to determine the presence and/or severity of the problems and their impact on functioning, and inform care planning, including the need for referral or follow-up.
Assessment of sexual functions and intimate relationships	Sexual functions refer to the mental and physical functions related to the sexual act, including the arousal, preparatory, orgasmic and resolution stages. Intimate relationship functions refer to the person’s ability to create and maintain close or romantic relationships with another person, such as husband, wife or sexual partners. The assessment (including initial screening) uses interviewing, physical examination or standardized self-reported questionnaires to determine the presence and/or severity of problems related to sexual functions and intimate relationships, and inform care planning, including the need for referral or follow-up. The romantic partner may be involved in the assessment.
Assessment of sleep disturbances	Sleep disturbances can relate to the experience of stress, existence of health conditions (e.g. mental health disorders), or presence of independent disorders such as insomnia, sleep apnoea, narcolepsy, restless legs syndrome and rapid eye movement (REM) sleep behaviour disorder. The assessment of sleep functions uses interviewing and brief standardized self-reported questionnaires to identify the potential presence of sleep disturbances, ascertain their impact on functioning, and inform rehabilitation planning, including the referral to specialist services if needed.
Assessment of speech functions	Speech impairments may include problems with speech fluency and rhythm, articulation and coordination of speech due to brain damage (e.g. stuttering, dysarthria or speech apraxia), hearing loss or developmental disorders. The assessment of speech functions (including initial screening to determine the need for comprehensive assessment) uses observation, interviewing, standardized self-reported questionnaires or standardized tests to determine the presence and/or severity of impairments in speech functions, ascertain their impact on functioning, and inform care planning, including the need for referral or follow-up.

Assessment	Description of the assessment
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.
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.
Behavioural interventions	Problems with behaviour (“challenging”, “problematic” or “inappropriate” behaviours, or “behavioural and psychological symptoms”) comprise, for example, agitation, aggression, inattention or overactivity. Problems with behaviour can be caused or triggered by factors that are biological (e.g. pain), social (e.g. boredom, insensitivity of others), environmental (e.g. noise and lighting) or psychological (e.g. emotional problems), and which may endanger the physical safety of the person or others, or may limit interpersonal interactions or prevent access to community facilities. Behavioural interventions are tailored to an individual’s needs and aim to reduce the intensity, frequency and duration of problematic behaviour, or replace the problematic behaviour by behaviours that are appropriate, through providing skills training, using positive or negative reinforcement strategies, or modifying the social or physical environment to reduce external triggers. Behavioural interventions may involve caregivers and family members.

Intervention	Description of the intervention
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.
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.
Cognitive training	Cognitive functions include orientation, attention, memory, abstraction, organization, planning, calculation and problem-solving. Cognitive training includes exercises and tasks designed to restore, retrain or compensate for impaired cognition. It consists of education, advice, and training techniques in the context of functional tasks. Under the guidance or assistance of a health worker, techniques are practised repetitively and, if feasible, performed self-directed by the patient following education and advice on the appropriate exercises.
Communication skills training	Difficulties in communication can relate to problems with understanding and expressing language, impairments in hearing, speech or vocal functions, and also to psychological issues. Training in communication skills aims to enable a person to communicate with others via spoken, written or other forms of language through, for example, communication partner training. Communication skills training includes advice on appropriate communication strategies and is practised in one-to-one or group format.
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.
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.
Language therapy	Problems with using language comprise difficulties to understand and express spoken, written or other forms of language, which exist in, for example, people with limited language development (e.g. in people with hearing loss), or due to different types of impairments following, for example, brain damage (e.g. aphasia). Language therapy aims to promote and restore understanding and expression of language through structured conversational practice and language stimulation (including early and family interventions) or, if full restoration is not possible, by developing compensatory strategies (e.g. using language cues) to allow a person to understand language and to express themselves. These techniques are practised repetitively and, if feasible, performed self-directed by the patient following education and advice on the appropriate techniques.

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"> • 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.
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>
Participation focused interventions	<p>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.</p>
Peer support	<p>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.</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 cognition	<p>The provision of assistive products (e.g. pill organizers, time management products, global positioning system locators, simplified mobile phones, personal emergency alarm systems) to support people's cognitive functions. 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.</p>
Provision and training in the use of assistive products for communication	<p>The provision of assistive products (e.g. communication boards/books/cards, electronic device and communication software, augmentative and alternative communication devices) to support communication. 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.</p>

Intervention	Description of the intervention
Provision and training in the use of assistive products for education	The provision of assistive products (e.g. products to adapt the desk or products to facilitate educational tasks) that support people to improve and maintain their level of functioning and independence in education at school or university. 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 perceptual functions	The provision of assistive products (e.g. spectacles with filters and protection) to support adequate perceptual arousal and response and to prevent over-arousal. Provision includes identification of the specific needs of the individual and selection 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 and employment	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 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.
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).
Relaxation training	Relaxation training targets subjective experiences of pain, stress and anxiety but also body functions such as muscle tension or heart functions (blood pressure, heart rate). Relaxation training comprises a variety of approaches such as progressive muscle relaxation, guided imagery, biofeedback, or deep breathing exercises. The training is guided by a health worker and, if feasible, performed self-directed following education and advice on the appropriate exercises.
Sensory integration interventions	Sensory integration interventions address sensory dysfunctions, specifically problems with the perception and processing of a sensory input, such as touch, sound, sight or smell, that impact the person's behavioural response. The interventions aim to improve how sensory inputs are integrated by using different stimuli (e.g. deep pressure or specific movements) in a structured and repetitive way. The interventions are play-oriented and may use equipment such as swings or a trampoline. Sensory integration is practiced under the guidance or assistance of a health worker and, if feasible, performed self-directed under the guidance of parents or other carers following education and advice on the appropriate activities.
Sensory stimulation	Sensory stimulation is the use of external environmental stimuli to promote arousal and adequate behavioural responsiveness, so that by gradually providing the nervous system with sensory information, the patient is able to perform adequate action depending on their level of responsiveness. Sensory stimulation programmes use different smells and flavours of moderate-to-high intensity, verbal and non-verbal sounds (e.g. white noise or music), visual stimuli (e.g. objects, photographs) and tactile stimuli (e.g. physical contact, feeling one's body, feeling objects of different textures, moving objects) to promote arousal and adequate behavioural responsiveness. Sensory stimulation is guided by a health worker and, if feasible, also provided by carers following education and advice on the appropriate exercises.

Intervention	Description of the intervention
Social skills training	Social skills involve different aspects of cognition, emotion and behaviour. Social skills training aims to improve, for example, problem-solving skills, control of emotions, and verbal and non-verbal communication through exercises, tasks and activities during individual or group activities. The training is guided and assisted by a health worker and, if feasible, applied self-directed by the patient with the support of caregivers or family members following education and advice on the appropriate activities.
Speech therapy	Problems with speech functions include impairments with fluency and rhythm of speech, articulation, and coordination of speech, due to impairments related to brain damage (e.g. stuttering, dysarthria or speech apraxia), or to hearing loss or development disorders. Speech therapy aims to improve the fluency and rhythm of speech, articulation and coordination of speech through, for example, phonological exercises or, if full restoration is not possible, by developing compensatory strategies (e.g. cued speech) to increase speech intelligibility and allow a person to express themselves well through speech. These techniques are practised repetitively and, if feasible, performed self-directed by the patient 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.
Supported education	Supported education aims to facilitate children, adolescents and young adults who have physical, sensory or mental impairments, to be engaged in education at school and university through providing intensive support. Supported education is a collaborative process among teachers, parents, support staff and school and university administrators. Specific support is provided with the strong involvement of teachers and administrators.
Supported employment	Supported employment is an approach to vocational rehabilitation. The aim of supported employment is to support people to be engaged in long-term paid employment. Supported employment is based on the following principles: customer engagement, vocational profiling, employer engagement, job matching, in-work support, and career development. Supported employment is provided with the strong involvement of the employer.
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.

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 autism spectrum disorders			
Abigail DELEHANTY	Speech and language pathologist	Employment; research funds	Not significant
Jessica HOOKER	Speech and language pathologist	Employment; research funds; non-monetary support; intellectual property	Not significant
Audrey THURM	Psychologist	None declared	N/A
Amy WETHERBY	Speech and language pathologist	Employment; research funds; non-monetary support; commercial business interests; trademark and copyright	Not significant
Jordan WICKSTROM	Biomechanist	None declared	N/A
For disorders of intellectual development			
Somer BISHOP	Psychologist	Copyrights	Not significant
Kristin DELL'ARMO	Psychologist	None declared	N/A
Emma SALZMAN	Psychologist	None declared	N/A
Marc TASSÉ	Psychologist	Non-monetary support	Not significant
Audrey THURM	Psychologist	None declared	N/A
Jordan WICKSTROM	Biomechanist	Employment; research funds; non-monetary support; commercial business interests; trademark and copyright	Not significant

A2.2 Development group members

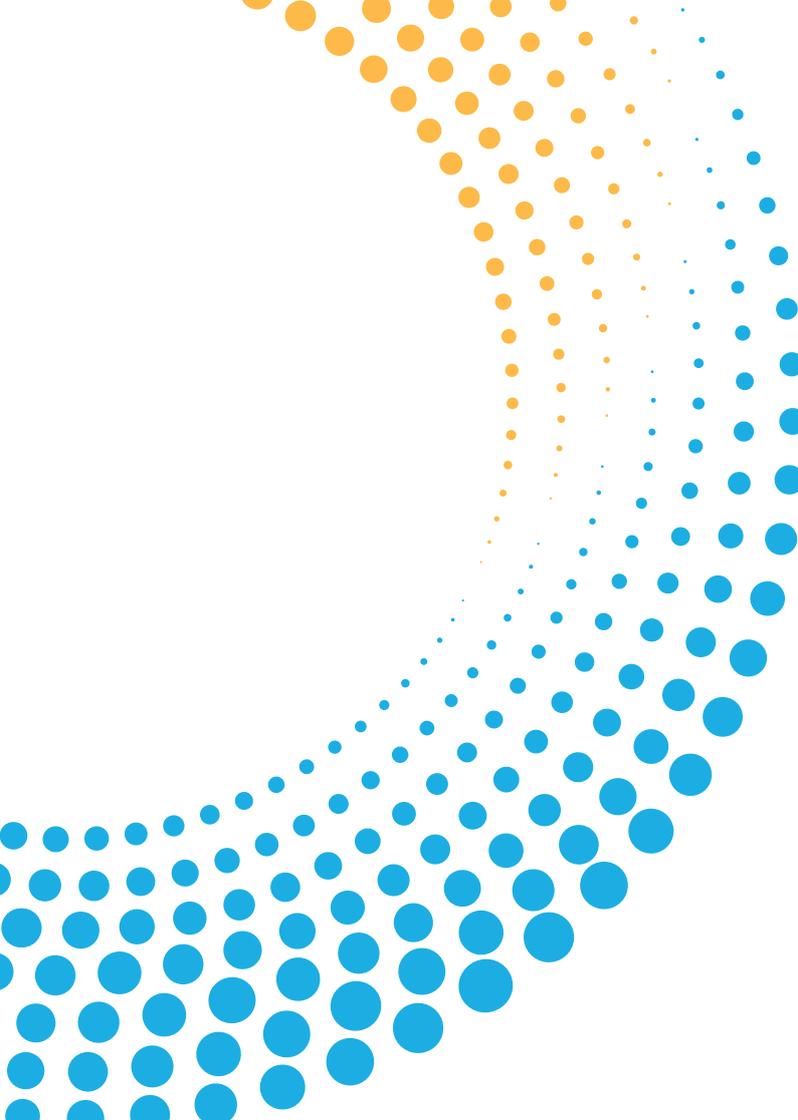
Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For autism spectrum disorders			
Marco BERTELLI	Psychiatrist	None declared	N/A
Somer BISHOP	Psychologist	None declared	N/A
Mirela-Carmen BURLLAU	Occupational therapist	Consultancy; research funds; public position	Not significant
Maria CHRISTOPOULOU	Speech and language pathologist	None declared	N/A
Heather CHURCH	Psychologist	Research funds; public position	Not significant
Sarah DABABNAH	Social worker	Research funds	Not significant
Miguel Angel DIVI CASTELLON	Music therapist	Employment; research funds; public position	Not significant
Deborah FEWSTER	Occupational therapist	Consultancy; research funds; non-monetary support	Not significant
Sandra Milena GRISALES MADRIGAL	Physiotherapist	Consultancy	Not significant
Yuko ITO	Occupational therapist	None declared	N/A
Giwon KIM	Physiotherapist	None declared	N/A
Anu KIPPOLA-PÄÄKÖNEN	Occupational therapist	None declared	N/A
Ashok MYSORE	Psychiatrist	None declared	N/A
Donna NIMEC	PRM physician	None declared	N/A
Yasser SALEM	Physiotherapist	None declared	N/A
Luis SALVADOR-CARULLA	Psychiatrist	None declared	N/A
Mindy SCHEITAUER	Psychologist	Employment; research funds; non-monetary support; public position	Not significant
Sarah VERDON	Speech and language pathologist	None declared	N/A
John VIJAY	Psychiatrist	None declared	N/A
Muhammad WAQAR AZEEM	Psychiatrist	None declared	N/A
For disorders of intellectual development			
Kim BULKELEY	Occupational therapist	None declared	N/A
Kurinji CHELVAN	Occupational therapist	None declared	N/A
Agostina CIAMPA	Occupational therapist	None declared	N/A
Euaggelia KENTROU	Physiotherapist	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
Karma LHAKI	Physiotherapist	None declared	N/A
Kiragasuru MADEGOWDA	Psychiatrist	None declared	N/A
Angela MORGAN	Speech and language pathologist	None declared	N/A
Kerim M. MUNIR	Psychiatrist; Epidemiologist	None declared	N/A
Pierre Ndayishimye	Physiotherapist	None declared	N/A
Kenneth POON	Psychologist; Special educator	Research funds; public position	Not significant
Ashok ROY	Psychiatrist	None declared	N/A
Laurence TAGGART	Nurse; Psychologist	None declared	N/A
Mohamed TAIEBINE	Speech and language pathologist; Psychologist	None declared	N/A
Marc J. TASSÉ	Psychologist	None declared	N/A
Audrey THURM	Psychologist	None declared	N/A
Rachael WANJAGUA	Physiotherapist	None declared	N/A

A2.3 Peer review group members

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
For autism spectrum disorders and disorders of intellectual development			
Peter CARPENTER	Psychiatrist	Employment; consultancy; public statements and position	Not significant
Maria del Carmen D'ASTOLFO	Consumer representative	None declared	N/A
Nelisiwe Elizabeth DUNGE	Educational specialist; Educational psychologist	None declared	N/A
Pragashnie GOVENDER	Occupational therapist	None declared	N/A
Deana HERRMAN	Physiotherapist	None declared	N/A
Rosa HOEKSTRA	Researcher	Consultancy; research funds; non-monetary support; public position	Not significant
Angelique KESTER	Occupational therapist	Consultancy	Not significant
Giwon KIM	Physiotherapist	None declared	N/A
Rafael MARTINEZ LEAL	Psychologist	None declared	N/A

Name	Expertise	Disclosure of interest	Assessment of disclosed interest
Meg McQUEEN	Occupational therapist	None declared	N/A
Calros PENA SALAZAR	Psychiatrist	Consultancy; research funds	Not significant
Marina SALVARA	Physiotherapist; Physical educator	None declared	N/A
Maria Luisa SCATTONI	Researcher	None declared	N/A
Antti TEITTINEN	Sociologist/ researcher	None declared	N/A
Susan WAMITHI	Developmental pediatritian	Employment; consultancy; non-monetary support	Not significant



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