

Section 3: What are the rehabilitation interventions that can help people living with HIV in SSA?

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3.1 – What are the rehabilitation interventions that address impairments common among people living with HIV?

This section is organized according to the categories of **impairment** in the World Health Organization's International Classification of Functioning, Disability and Health (see Section 1.3).

[3.1.1 – Mental impairments](#)

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3.1.1 – Mental impairments

People living with HIV commonly experience mental impairments. These impairments include (but are not limited to) difficulties related to consciousness, orientation, intellect, energy and drive, sleep, attention, memory, emotion, perception, cognition and language.

These impairments may be caused by the HIV infection itself, one of the many opportunistic infections associated with HIV or side-effects of various HIV-related medications. Pre-existing mental impairments may also be present which further have an impact on the rehabilitation of people living with HIV.

Rehabilitation interventions for these mental impairments include specific psychosocial techniques as well as general exercise and education. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.1: Clinical Aspects of Mental Impairments

Impairments	Possible Etiologies	Rehabilitation Interventions ¹ (for details, see Section 3.3)
HIV Cognitive-Motor Complex (also known as AIDS Dementia Complex or HIV Dementia)	HIV (the virus itself) Opportunistic infections Side effects of medication	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Fatigue management • Psychosocial rehabilitation • Relaxation techniques
Cognitive impairment (including memory loss)	Hypoxia Cryptococcal meningitis TB meningitis Syphilis Neurovascular disease (stroke) Focal cerebral disease Vitamin deficiency (e.g., B12, B6) Electrolyte abnormalities Pain-related	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Fatigue management • Psychosocial rehabilitation • Relaxation techniques
Psychological disorders (including depression, mood disorders, anxiety and delirium)	Related to cognitive impairment Side effects of medication Psychosocial factors (e.g. stigma)	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Fatigue management • Psychosocial rehabilitation • Relaxation techniques

	<p>Premorbid psychiatric disorders</p> <p>Post-traumatic stress disorder</p> <p>Pain-related</p>	
Substance-related disorders	<p>Prescription medications (e.g., narcotics)</p> <p>Over-the-counter medications</p> <p>Street drugs: premorbid or current</p> <p>Alcohol: premorbid or current</p>	<ul style="list-style-type: none"> • Psychosocial rehabilitation • Referral to drug or alcohol treatment
Fatigue (including low energy and poor sleep)	<p>Nutritional deficiencies</p> <p>Chronic diarrhea (malabsorption)</p> <p>Anemia (pre-existing, HIV or medication-related)</p> <p>Side effects of medication</p> <p>Hormone-related (e.g., thyroid, adrenal)</p> <p>Psychological (e.g., depression, anxiety)</p> <p>Chronic pain</p>	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Fatigue management • Psychosocial rehabilitation

3.1.2 – Sensory functions and pain

Pain is commonly experienced by people living with HIV at all stages of the disease process. Pain prevalence ranges from 54% to 83%. This pain is often of moderate to severe intensity which has a negative impact on physical functioning.²

Pain rehabilitation techniques include electrotherapy modalities, cryotherapy and massage, as well as exercise prescription and education. Other sensory impairments, including difficulties related to sight, hearing and vestibular control are also experienced by people living with HIV. These may be managed by environmental modifications, provision of assistive devices and education.

These impairments may be caused by the HIV infection itself, one of the many opportunistic infections associated with HIV or toxicity or side-effects of various HIV-related medications. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.2: Clinical Aspects of Sensory Impairment

Impairments	Possible Etiologies	Rehabilitation Interventions ³ (for details, see Section 3.3)
Visual loss (including retinitis, retinal detachment, retinal vascular disease and blindness)	Viral (e.g., CMV, HSV, VSV) Parasitic (e.g., Toxoplasmosis) Fungal (e.g., PCP) Bacterial (e.g., Cryptococcus) Malignancy (e.g., Kaposi's sarcoma, Burkitt's lymphoma) Ischaemia Cranial nerve involvement Diabetes-related Side effects from medication Pre-existing (e.g., cataracts)	<ul style="list-style-type: none"> • Assistive devices • Environmental adaptation • Psychosocial rehabilitation • Visual Loss - meal preparation, shopping and medication
Auditory impairments (including hearing loss, tinnitus and otalgia)	HIV (the virus itself) Opportunistic infections Lesions in the central nervous system Medication-related Pre-existing	<ul style="list-style-type: none"> • Assistive devices • Auditory training • Education on managing conversations and communication, cued speech, use of visual clues, learning strategies • Environmental adaptation

<p>Vestibular impairments (including dizziness and poor balance)</p>	<p>Otitis media</p> <p>Side effects of medication</p> <p>Visual impairment</p>	<ul style="list-style-type: none"> • Environmental adaptation
<p>Pain (acute and chronic)</p>	<p>Musculoskeletal pain (inflammatory or non-inflammatory)</p> <p>Secondary processes, inactivity or deconditioning</p> <p>Joint pain caused by bacterial infections, arthritis and medication</p> <p>Central nervous system lesions (parasitic, fungal, bacterial, fungal or malignant)</p> <p>Peripheral neuropathy (HIV or medication-related)</p> <p>Myelopathy (e.g., secondary to CMV)</p> <p>Systemic pain (e.g. malignancies, pleurisy, esophagitis, myocarditis, colitis)</p> <p>Exacerbation of pain by lack of sleep, anxiety or depression</p> <p>Impact of life situation (stress, finances, etc.)</p>	<ul style="list-style-type: none"> • Cryotherapy • Desensitisation techniques • Electrotherapy Modalities (e.g., TENS, IFT) • Environmental adaptation • Exercise prescription – aerobic • Exercise prescription – strength • Exercise prescription – stretching and passive movement • Heat therapy • Massage therapy • Psychosocial rehabilitation • Relaxation techniques • Splinting and joint support
<p>Sensation changes (including numbness, burning or tingling)</p>	<p>HIV</p> <p>Peripheral neuropathy</p>	<ul style="list-style-type: none"> • Desensitization • Exercise prescription – aerobic • Exercise prescription – strength • Exercise prescription – stretching and passive movement

3.1.3 – Voice and speech functions

People living with HIV experience impairments relating to voice and speech function caused by infection of the viral pathogen or secondary sarcomas and bacterial or fungal infections. In some cases, voice and speech impairments are associated with neurological impairments.

Rehabilitation interventions for voice and speech functions include exercise related to articulation, fluency, resonance, language as well as adaptation of the communication environment. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.3: Clinical Aspects of Voice and Speech Impairments

Impairments	Possible Etiologies	Rehabilitation Interventions ⁴ (for details, see Section 3.3)
Dysphagia	Kaposi's sarcoma of mouth, pharynx, larynx Viral, bacterial or fungal infection	<ul style="list-style-type: none"> • Articulation, fluency, resonance, language advice and exercises • Swallowing studies and trial feeding
Phonatory dysfunction	Kaposi's sarcoma of mouth, pharynx, larynx Viral, bacterial or fungal infection	<ul style="list-style-type: none"> • Articulation, fluency, resonance, language advice and exercises
Dysarthria	Viral pathogen Neurogenic anomalies of viral infection	<ul style="list-style-type: none"> • Articulation, fluency, resonance, language advice and exercises • Psychosocial rehabilitation

3.1.4 – Functions of the cardiovascular, hematological, immunological and respiratory systems

People living with HIV experience impairments related to the heart, blood pressure, hematological system (blood), immune system (including allergies, hypersensitivity) and respiration (breathing).

Possible causes of these impairments include primary HIV infection or secondary bacterial and fungal infections such as cytomegalovirus, Pneumocystis Carinii Pneumonia (PCP) or Tuberculosis (TB). Malignancy such as Kaposi's sarcoma and Non-Hodgkin's Lymphoma are also secondary complications which affect the cardiovascular, hematological, immunological and respiratory systems. These impairments can also be caused by side effects of medications.

Rehabilitation interventions include chest physiotherapy, aerobic and strength exercise, pain management and adaptation of environment. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.4: Clinical Aspects of Cardiovascular, Hematological, Immunological and Respiratory Impairments

Impairment	Possible Etiologies	Rehabilitation Interventions (for details, see Section 3.3)
Impairments related to cardiac dysfunction (e.g., angina pain, anxiety, decreased endurance)	Myocarditis or endocarditis (e.g., from bacterial or fungal infection)	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Nutritional advice • Pain management • Psychosocial rehabilitation • Relaxation techniques • Return to work strategies
	Cardiomyopathy (e.g., from viral pathogens or side effects of medication)	
	Pericarditis or pericardial effusion (e.g., resulting from infections from multiple pathogens)	
	Coronary artery disease (e.g., resulting from side effects of medication)	
	Peripheral vascular disease (e.g., resulting from viral pathogens)	
Shortness of breath and other respiratory impairments	Acute lung disease (e.g., pneumonia)	<ul style="list-style-type: none"> • Assistive devices • Chest physiotherapy techniques • Exercise prescription – aerobic • Exercise prescription – strength • Nutritional advice • Pain management • Psychosocial rehabilitation
	Malignancies (e.g., Kaposi's sarcoma, Non-Hodgkins Lymphoma)	

3.1.5 – Functions of the digestive, metabolic and endocrine systems

People living with HIV may present with impairments related to digestion, endocrine function and weight maintenance (both excessive weight loss and weight gain). These impairments may be caused by the HIV infection itself, one of the many opportunistic infections associated with HIV, or side-effects of various HIV-related medications.

Dietary advice and exercise prescription can be utilized as methods to assist people living with HIV with both weight gain and weight loss. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.5: Clinical Aspects of Digestive, Metabolic and Endocrine Impairments

Impairments	Possible Etiologies	Rehabilitation Interventions ⁶ (for details, see Section 3.3)
Digestive dysfunction	HIV enteropathy Secondary infections (e.g., MAC, cryptosporidium) Obstruction (e.g., tumour) Food intolerances Medication-related	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Nutritional advice
Endocrine dysfunction	Malignancy Adrenal insufficiency Hypogonadism Hypothyroidism Medication-related Food intolerances	<ul style="list-style-type: none"> • Nutritional advice • Pain management
Weight loss	Anorexia secondary to physiological (e.g., oesophagitis, candida) or psychological causes Dysphagia (e.g., due to candida, KS or CMV) Malnutrition Malabsorption Malignancy	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Nutritional advice • Psychosocial rehabilitation • Weight loss interventions

	Infection and fever-related Side effects of medication	
Weight gain	Inactivity and deconditioning Constipation Side effects of medication	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Exercise prescription – stretching and passive movement • Nutritional advice • Psychosocial rehabilitation • Weight gain interventions
Weight redistribution	HIV-infection Side effects of medication Lipodystrophy	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Nutritional advice • Psychosocial rehabilitation

3.1.6 – Genitourinary and reproductive functions

People living with HIV can experience impairments of genitourinary and reproductive functions. These impairments are related to urination functions and sexual functions and may be directly caused by the viral pathogen or secondary bacterial and fungal infection. Side effects of medications also have an effect on urinary and sexual functions. Sexual impairments can also result from psychosocial etiologies.

Rehabilitation interventions include psychosocial rehabilitation, electrotherapy modalities and exercise. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.6: Clinical Aspects of Genitourinary and Reproductive Impairments

Impairments	Possible Etiologies	width="36%"Rehabilitation Interventions ⁷ (for details, see Section 3.3)
Urination dysfunction	Urinary tract infection Viral pathogen affecting the nervous system Side effects of medication Opportunistic infections Other fungal or bacterial infections	<ul style="list-style-type: none"> • Exercise prescription - pelvic floor • Nutritional advice
Sexual impairments including loss of libido, pain during sex and male erectile problems	Viral pathogen Emotional issues (e.g., anxiety, stress, grief and depression) Smoking Side effect of medication Alcohol use Recreational drug use Hormone dysfunction (e.g., testosterone deficiency and thyroid dysfunction in men and women, early menopause in women with HIV) Autonomic and/or peripheral neuropathy Sexually transmitted infections	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Psychosocial rehabilitation • Referral to sex therapy

3.1.7 – Neuromuscular and movement related structures

People living with HIV commonly experience neuromuscular and movement-related impairments. These impairments include (but are not limited to) difficulties related to joint mobility, muscle power and involuntary movements.

These impairments may be caused by pathology in the central nervous system, spinal cord or peripheral nervous system. Neuromuscular rehabilitation techniques include massage therapy, passive movements, proprioceptive neuromuscular facilitation (PNF) and Bobath techniques, and exercise prescription. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.7: Clinical Aspects of Neuromuscular and Movement related Impairments

Impairments	Possible Etiologies	Rehabilitation Interventions ⁸ (for details, see Section 3.3)
Reduced joint mobility	Disuse Inflammation Fluid retention	<ul style="list-style-type: none"> • Assistive devices • Electrotherapy Modalities • Exercise prescription – aerobic • Exercise prescription – strength • Exercise prescription – stretching and passive movement • Heat therapy • Massage therapy • Pain management
Muscle tone (increased or decreased tone including flaccidity, spasticity and rigidity)	Deconditioning Central nervous system lesions (including stroke, malignancy or infection) Spinal cord pathology (including myelitis, TB) Lower motor neuron lesions	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Exercise prescription – stretching and passive movement • Neurological rehabilitation • Psychosocial rehabilitation
Reduced muscle strength, power and endurance	Inactivity or deconditioning due to prolonged bed rest or illness Central nervous system lesions (including stroke, malignancy or infection) Spinal cord pathology (including myelitis, TB spine)	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Neurological rehabilitation • Psychosocial rehabilitation

	<p>Acute inflammatory demyelinating polyneuropathy</p> <p>Inadequate nutritional intake</p> <p>Anemia</p> <p>Electrolyte abnormalities</p>	
<p>Involuntary movements (including dystonia and ataxia)</p>	<p>Central nervous system lesions</p> <p>Side effects of medication</p> <p>Electrolyte abnormalities</p>	<ul style="list-style-type: none"> • Neurological rehabilitation • Psychosocial rehabilitation
<p>Decreased bone density (including osteoporosis and osteopenia)</p>	<p>Inactivity or deconditioning</p> <p>Severe weight loss</p> <p>Malnutrition</p> <p>Hormonal imbalances</p>	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength • Nutritional advice
<p>Osteonecrosis (avascular necrosis)</p>	<p>Etiology unknown but associated with HIV infection</p>	<ul style="list-style-type: none"> • Exercise prescription – aerobic • Exercise prescription – strength

3.1.8 – Functions of the skin and related structures

People living with HIV may experience impairments related to the skin and related structures. Impairments may be caused by viral, fungal or bacterial infections. Kaposi's sarcoma commonly affects the skin.

Rehabilitation interventions include psychosocial rehabilitation, advice on skin care and exercises. Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.1.8: Clinical Aspects of Skin Impairments

Impairments	Possible Etiologies	Rehabilitation Interventions ⁹ (for details, see Section 3.3)
Skin lesions (including cold sores, rashes, and warts)	Herpes simplex and other viral infections Kaposi's sarcoma	<ul style="list-style-type: none"> • Psychosocial rehabilitation • Skin care, clothing and environmental advice • Assistive devices
Skin infections	Molluscum contagiosum, folliculitis, seborrheic dermatitis, psoriasis and tinea, caused by viral, bacterial and fungal infections	<ul style="list-style-type: none"> • Psychosocial rehabilitation • Skin care, clothing and environmental advice • Assistive devices

3.2 – What are the rehabilitation interventions that can address the activity limitations and participation restrictions common among people living with HIV?

The impairments described in [Section 3.1](#) may result in a variety of **activity limitations** and restrictions to an individual’s **participation** in education, vocational, family and social pursuits.

A broader and more holistic rehabilitation approach should take into account the activity limitations and participation restrictions faced by people living with HIV. Rehabilitation providers have important roles to play in addressing these challenges at multiple levels. For example:

- Clinical interventions
- Education to family and community
- Advocacy efforts to address the circumstances that create these challenges

It is vital that rehabilitation providers see that they have a role across the spectrum of the disease process from acute hospital care to long-term follow-up in the community. When rehabilitation providers are working with people living with HIV, they should consider both the individual’s personal characteristics (e.g., age, gender, economic status), as well as the environment in which they live, socialise and work.

Rehabilitation providers should also, where possible, be involved in **advocacy** efforts to ensure the efficient and effective provision of rehabilitation services to people living with HIV, particularly those from marginalized groups (e.g., unemployed, people with disabilities). Advocacy efforts can be strengthened by active involvement in community-based research initiatives focusing on rehabilitation for people living with HIV.

This section is organized according to the categories of *activity* and *participation* in the World Health Organization’s International Classification of Functioning, Disability and Health (see [Section 1.3](#)). Potential causes of these impairments and rehabilitation interventions are shown in the table below.

Table 3.2: Rehabilitation Interventions for Activity Limitations and Participation Restrictions

Activity Limitations and Participation Restrictions	Rehabilitation interventions ⁹ (for details, see Section 3.3)
Learning and applying knowledge	<ul style="list-style-type: none"> • Adult-based education programmes • Assistive devices • Environmental adaptation • Provision of visual education materials
General tasks and demands	<ul style="list-style-type: none"> • Energy conservation and pacing • Environmental adaptation • Exercise prescription – aerobic

	<ul style="list-style-type: none"> • Exercise prescription – strength • Home-based rehabilitation • Return to work strategies
Communication	<ul style="list-style-type: none"> • Adaptation of communication environment • Articulation, fluency, resonance, language advice and exercises • Education on managing conversations and communication • Environmental adaptation • Psychosocial rehabilitation
Mobility	<ul style="list-style-type: none"> • Assistive devices • Community-based rehabilitation • Energy conservation and pacing • Environmental adaptation • Ergonomic interventions • Exercise prescription – aerobic • Exercise prescription – strength • Exercise prescription – stretching and passive movement • Home-based rehabilitation
Self-care	<ul style="list-style-type: none"> • Advice on personal hygiene • Advice and exercises related to transfers • Assistive devices • Energy conservation and pacing • Environmental adaptation • Ergonomic interventions • Home-based rehabilitation
Domestic life	<ul style="list-style-type: none"> • Advice on meal preparation and nutrition • Assistive devices • Energy conservation and pacing • Environmental adaptation • Home-based rehabilitation
Interpersonal interactions and relationships	<ul style="list-style-type: none"> • Couple counseling • Family support groups and parenting programmes • Involvement and education of family and friends

	<ul style="list-style-type: none"> • Psychosocial rehabilitation
Major life areas including work and employment	<ul style="list-style-type: none"> • Education and advice on social grants/ employment legislation • Energy conservation and pacing • Environmental adaptation • Ergonomic interventions • Extra-mural education and activities for learners • Involvement and education of employers, colleagues and educators • Psychosocial rehabilitation • School education programmes • School feeding programmes
Community, social and civic life	<ul style="list-style-type: none"> • Community-based rehabilitation • Education and advice on human rights • Energy conservation and pacing • Involvement and education of spiritual, political and community leaders

3.3 – More information on rehabilitation interventions for people living with HIV in Sub-Saharan Africa

- [Articulation, fluency, resonance, language advice and exercises](#)
- [Assistive devices](#)
- [Auditory training](#)
- [Chest physiotherapy techniques](#)
- [Community-based rehabilitation \(CBR\)](#)
- [Cryotherapy](#)
- [Desensitisation techniques](#)
- [Electrotherapy modalities](#)
- [Energy conservation and pacing](#)
- [Environmental adaptation](#)
- [Ergonomic interventions](#)
- [Exercise prescription – aerobic](#)
- [Exercise prescription - pelvic floor](#)
- [Exercise prescription – strength](#)
- [Exercise prescription – stretching and passive movement](#)
- [Fatigue management](#)
- [Heat therapy](#)
- [Home-based rehabilitation \(HBR\)](#)
- [Massage therapy](#)
- [Neurodevelopmental therapy \(NDT\)](#)
- [Neurological rehabilitation](#)
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- [Positioning](#)
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- [Skin care, clothing and environmental advice](#)
- [Swallowing studies and trial feeding](#)
- [Visual Loss - meal preparation, shopping and medication](#)
- [Visual loss - referrals](#)
- [Weight gain interventions](#)
- [Weight loss interventions](#)

Articulation, fluency, resonance, language advice and exercises

Advice and exercises can be given to individuals to address challenges with speaking. These include rehabilitation to improve fluency, resonance, phonation, producing sound, intonation, variance of pitch, and voice and language, as well as aeromechanical components of respiration. Individuals may be assessed by a speech language therapist and work in collaboration with the multidisciplinary team to implement therapy.

Assistive devices

The provision of assistive devices can help people with disabilities address and adapt to their environment, promoting normal lifestyle and facilitating employment and education participation. Examples of assistive devices are mobility devices, home modification devices, respiratory devices, hearing aids, and self-care equipment. In resource-poor settings, assistive devices can range from low cost to high cost and some devices can be no cost. Examples of low cost devices are spacers modified from plastic bottles or cups, which are used to administer medication for children. Cardboard boxes can also be used to make appropriate seats for infants with developmental delay. Non-governmental organisations in Africa can be a valuable source of assistive devices.

Auditory training

For auditory impairments and assistive devices, referrals should be made to an audiologist or the specific country's association for deaf people (e.g., the South African National Deaf Association (SANDA)). Rehabilitation providers can give advice to individuals with auditory impairments, including: environmental modifications, auditory training and cued speech.

Chest physiotherapy techniques

Chest physiotherapy techniques are used to treat individuals with respiratory impairments. The goals of treatment are to mobilise secretions to clear lungs, improve the work of breathing and improve oxygenation of the lungs. There are a variety of chest physiotherapy techniques including (but not limited to) deep breathing exercises, active cycle of breathing techniques (ACBT), positioning to encourage postural drainage, and manual techniques such as percussion, vibrations and shaking. Respiratory devices such as positive expiratory pressure masks, incentive spirometers and flutter devices can be used to assist chest physiotherapy techniques.

Community-based rehabilitation (CBR)

The aim of CBR is to promote inclusion of people with disabilities, by establishing community-based programs for social integration, equalization of opportunities, and rehabilitation programs.¹⁰ Leadership in CBR is not dependent on professionals in healthcare, education, vocational or social services but it involves community leaders, families and people with disabilities. It is a multi-sectoral strategy that empowers persons with disabilities to access and benefit from education, employment, health and social services. CBR is delivered within the community using predominantly local resources. CBR ranges from providing assistive devices for people with disabilities to coordinating with local schools to include vocational rehabilitation for adult education as well as family support and counselling.

Community-based rehabilitation (CBR) has been shown to be beneficial for individuals with a number of impairments. For example, rehabilitation of stroke patients in the community can lead to improved recovery, with regaining of independence and improved abilities to perform activities of daily living.¹¹ While there is a growing body of research related to CBR interventions in low and middle-income countries,¹² there is limited evidence on CBR interventions for people living with HIV, particularly in Sub-Saharan Africa.

It is important that rehabilitation providers are aware of community organisations operating within their local areas and collaborate with these organisations, where possible. People living with HIV throughout the world have been proactive in developing and managing community-based responses related to education, food security and advocacy efforts. Examples of these organisations working within Sub-Saharan Africa include the Treatment Action Campaign, The Hunger Project and Stay Alive for Us All (SAFUA), an NGO involving a number of widows of HIV in Kenya.

Cryotherapy

Cryotherapy is the use of low temperatures such as cold water or ice to reduce pain, inflammation and spasm. In acute injuries cryotherapy is used to promote vasoconstriction of blood vessels and reduce the effects of inflammation and cell damage. Cryotherapy is not recommended for children under three years of age or for children with severe sensory or communication disorders.

Desensitisation techniques

Desensitisation techniques can be employed to assist people living with HIV who suffer from hypersensitivity, hyperalgesia and allodynia related to conditions such as peripheral neuropathy and polyneuropathy. These techniques include advice regarding adaptation of clothing, such as wearing seamless clothing or wearing socks inside out. Rubbing of the skin with variously textured materials (from smooth to rough) can help desensitise skin. As individuals become less sensitive, contrast bathing (the alternating use of cold and hot water bathing) can be used to treat affected areas of the body.

Electrotherapy modalities

Interferential Therapy (IFT)

IFT is the use of low frequency electrical stimulation created by the interference of two medium frequency currents passing through tissues simultaneously. These result in the stimulation of nerve endings. IFT is applied using 2-4 surface electrodes that are metal plate and pads with water-soaked sponges, carbon rubber electrodes with conducting gel, or suction cup electrodes. IFT is used to manage pain, elicit muscle contraction, decrease oedema, increase blood flow, and stimulate soft tissue healing and repair. IFT devices are becoming portable and practitioners are able to use them easily in community settings. IFT is not recommended for use with children.

Transcutaneous electrical nerve stimulation (TENS)

TENS is a battery-operated electrical device that is used to relieve pain. It has surface electrodes (2 or more) that transfer electrical current to the surface of the skin and cause nerve stimulation. A TENS unit modulates pulse width, frequency and intensity.

There are a variety of other electrotherapy modalities that may benefit people living with HIV, including ultrasound therapy, pulsed shortwave diathermy (PSD), laser therapy and infrared therapy.

Energy conservation and pacing

Pacing and energy conservation techniques assist individuals to balance work, social and leisure pursuits by ensuring they have the necessary energy levels when required. Various strategies can be taught to people living with HIV by rehabilitation providers to achieve optimum energy levels. Education includes the collaborative setting of achievable goals, advice on the planning of errands to minimise fatigue, and teaching correct posture and biomechanics to ensure efficiency of activity. Adaptation of the physical environment can also assist with energy conservation, as can the prescription of assistive devices, where required. Rehabilitation and exercise sessions should be timed when individuals typically have the highest levels of energy and where necessary, to ensure the optimal effect of any medication (e.g., analgesics) that the individual may take prior to exercise.

Environmental adaptation

Environmental adaptation refers to changing or restructuring the environment to meet the needs of people with impairments. The change could involve home, work, community and/or study environments e.g., adapting the environment of the home to accommodate a person using a wheelchair by clearing passages and widening doorways.

Ergonomic interventions

Ergonomics involves the re-design of the physical environment and the use of equipment to better complement the individual living within that environment. Practical examples of applying ergonomic principles include the re-positioning of furniture in the home, school and/or workplace to decrease musculoskeletal overuse injuries, and advising regular rest intervals during sustained activities. Advice on posture and biomechanics when working or studying can also reduce undue strain and fatigue. Task analysis of an individual's daily activities can ascertain priority areas for intervention. Knowledge of one's country's specific occupational and safety acts is also important to ensure that employers make the necessary adaptations for all workers, particularly those who may have physical and/or cognitive impairments. Knowledge of inclusion policy within a country can also determine adaptations to be made in schools.

Exercise prescription – aerobic

Aerobic (also known as cardiovascular) exercise includes activities such as walking, jogging, stepping, swimming and cycling. Aerobic exercise has been shown to be beneficial for people living with HIV,¹³ including interventions conducted in Sub-Saharan Africa,^{14,15} conferring physical benefits as well as improving mental health and quality of life, and reducing symptoms of depression. These exercises can be done at little or no cost and can be performed with fellow patients, friends and family members. Although few studies investigate the role of aerobic exercise in children living with HIV, preliminary results suggest that it is an appropriate intervention provided the child is not acutely ill.

Exercise prescription - pelvic floor

Pelvic floor exercises (e.g., kegels) can be used to strengthen the muscles beneath the uterus, bladder and bowel. These exercises can be taught to men or women who have any problems with bladder or bowel incontinence. Individuals should initially be taught how to contract these muscles when the bladder and bowel are empty and then progress to building the endurance of these muscles and finally

using these exercises to limit or prevent incontinence. Individuals should be encouraged to continue with these exercises even when the incontinence has resolved.

Exercise prescription – strength

Strength (or resistance) training involves exercises that overcome either internal or external forces using body weight or a variety of equipment including free weights (dumbbells and barbells), machine weights, resistance bands/tubing and hydrotherapy. When correctly taught, these exercises can improve muscle strength, power, endurance and coordination, and also improve daily functioning and quality of life. This form of exercise has been shown to be safe and beneficial for people living with HIV.¹⁶ Although few studies investigate the role of strengthening exercise in children infected with HIV, preliminary results suggest that it is an appropriate intervention if the child is not acutely ill.

Exercise prescription – stretching and passive movement

Passive movement is the movement of separate parts of an individual's body by the rehabilitation provider or by another external force. Passive movements and stretching exercises can help improve flexibility and circulation, normalise muscle tone and reduce the risk of contractures and pressure sores. Family members and friends can be taught to assist with these exercises, providing both a therapeutic intervention as well as an opportunity for interaction and involvement with others. Static stretching exercises can be taught to individual patients while proprioceptive neuromuscular facilitation (PNF) techniques should always be instructed by a trained professional.

Fatigue management

The exercise prescription described above should incorporate principles of task analysis, pacing of activities, efficiency of tasks and the suitable timing of therapy/exercise so as to improve levels of energy, rather than exacerbate fatigue. An assessment of the workplace and home environment, including ergonomic considerations (see above), should be conducted, in order to assist the individual, where possible, to conserve energy. It is also vital to assess the individuals' nutritional requirements, so as to time exercise suitable around meals. Where individuals cannot afford adequate nutrition, as is common in many resource-poor communities, individuals should be referred to community-based/NGO feeding schemes if available.

Heat therapy

Heat therapy (also called thermotherapy) is the application of heat to the body to relieve pain. Methods of application include warm water, hot packs (hydrocollator or microwave heated), ultrasound, infrared lamp, and hot cloth. In some facilities, whirlpool baths and hot thermal wraps are available. Heat is also used to reduce joint stiffness and oedema, aid healing, and relieve muscle spasms. Great care should be taken when using heat therapy with young children, the elderly, or anyone with altered sensation.

Home-based rehabilitation (HBR)

HBR is a rehabilitation strategy that is usually coordinated by rehabilitation providers and may be supplemented by non-governmental organisations. It provides care for patients in their own homes. It is used for patients post-discharge from the acute healthcare setting or when patients are unable to access healthcare services. In some cases, rehabilitation providers are able to provide HBR care, but

often due the scarcity of rehabilitation providers, healthcare workers and community-based carers are trained to provide HBR services. A home stimulation programme taught to the caregiver can significantly improve cognitive and motor development in young children infected with HIV.²⁹

Massage therapy

Massage is the use of physical techniques or manipulations such as Swedish strokes, deep tissue work, myofascial release and neuromuscular techniques. It is used to relieve pain, improve circulation, reduce oedema, increase mobility of connective tissue, relieve stress and improve quality of life. Massage is also believed to have a positive effect on immune function through stress mediation and enhanced with the use of other stress modalities.¹⁷

Neurodevelopmental therapy (NDT)

NDT therapy is typically provided by a physiotherapist, occupational therapist or speech therapist. It is used to treat children or adults with neurological disorders, and is potentially useful in treating children with HIV encephalopathy. The aim is to optimize functional abilities by improving postural tone and co-ordination. The family is very important in providing continued treatment at home.

Neurological rehabilitation

Neurological rehabilitation interventions are designed to reduce the symptoms of people with neurological impairments and improve their functional ability. These include activities to improve mobility and gait, exercises to improve movement and strength (active, passive and proprioceptive neuromuscular facilitation and neurodevelopmental therapy), techniques to minimise disorders of muscle tone (such as Bobath or Motor Relearning techniques), assistance with activities of daily living (e.g., washing, dressing, feeding), speech therapy to assist with speaking and swallowing, and advice on assistive aids to promote independence. Involvement of family and friends in this rehabilitation and the referral to community support groups, where possible, should be central to these interventions. Appropriate psychosocial interventions may also enhance the success of this form of rehabilitation.

Nutritional advice

Poor diet has a direct effect on the immune system. Advice on nutrition must be tailored to the individual and her/his circumstances. People living with HIV may suffer from weight loss or weight gain. Individuals need to eat a balanced diet with fat, carbohydrates and protein. Individuals could be advised to eat several small meals per day using what is available to supplement all food groups. Individuals may be further advised, to keep log books on their weight and diet, with education on warning parameters for weight loss or gain. Dieticians or nutritionists may recommend daily multivitamins. Referral can be made to a dietician (when available) who may conduct a nutritional assessment, counsel individuals, or assist with food provision through referral to nutrition supports. Alternatively rehabilitation providers can encourage people living with HIV to begin subsistence farming and set up vegetable gardens or small animal rearing projects to produce food. Any advice on nutrition must include information on adequate hydration level for each individual.

Pain management

Research shows that if individuals have an understanding of why they are suffering from pain, it will help them manage their pain.¹⁸ Education, thus, is vital in helping minimize the experience of pain. Furthermore, aerobic exercise (see above) can also be an effective means of reducing pain.¹⁹ Other non-pharmacological interventions for pain management include relaxation techniques, increased rest, balance diet, acupuncture and TENS (see above).

Up to 15% of people living with HIV may develop peripheral neuropathy characterized by distal, symmetric anesthesia and/or painful dysesthesia.²⁰ Although peripheral neuropathy is present in untreated HIV infection, exposure to Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTI), places individuals at an increased risk.³⁰ Interventions to address peripheral neuropathy include transcutaneous electrical nerve stimulation (TENS) or interferential current (IFC) for symptomatic management, adapted footwear, night ankle splints and bed tents to keep sheets off of feet and desensitization techniques (e.g., rubbing hands and feet with varying textures of material).

Medication can assist in pain management, but this intervention should be directed by a qualified practitioner. Pharmacological interventions for pain include topical analgesics, opioids, non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids.

Positioning

Advice on positioning can be provided to individuals who may suffer from a number of impairments related to HIV. Correct positioning can help with the drainage of respiratory secretions, limit postural deformities, improve the function of individuals with neurological impairments, decrease swelling and minimise secondary complications of disuse such as pressure sores and contractures. Additional devices such as pillows, splints and gel pads can further limit these complications.

Psychosocial rehabilitation

More specialised psychological rehabilitation services can be offered by specifically trained professionals, including psychiatrists, psychologists, psychotherapists and occupational therapists. However, primary prevention, in the form of exercise, adequate nutrition and maximizing quality of life falls within the scope of all rehabilitation providers. Social support structures, such as friends, family, cultural, religious and other community organizations, can also provide emotional and practical support.

Relaxation techniques

Relaxation techniques (including stress reduction techniques, visualization and imagery, progressive muscle relaxation, and the use of music) can improve name and face recall, short-term memory and incidental learning, reduce anxiety and depression, and strengthen immune function. Where possible, family members, friends and caregivers should also be taught these techniques, as they have been shown to increase caregivers' self-efficacy. Singing and rocking infants and small children can be very effective in promoting relaxation.

Return to school strategies

These strategies are similar to those discussed in Return to Work Strategies (see below). The rehabilitation provider can work together with the child, family and educators to prepare a child for return to school. This is particularly important after long absences, when the child has been extremely ill, or is returning with a new disability. The peers of the returning child should be prepared and given strategies to support their friend.

Return to work strategies

Return to work strategies are aimed at rehabilitating people with impairments to facilitate their return to work. It prepares both the employer and employee for what is involved in their return so optimal function is resumed. The employer and employee work together to tailor the work to suit the needs of the employee. The rehabilitation provider, employee and employer work hand in hand to develop and implement strategies for return to work. All employees should be trained to prevent injury, and provide an environment that is supportive toward people living with disabilities.

Skin care, clothing and environmental advice

Individuals living with HIV in Sub-Saharan Africa need advice on environmental influences on skin. Direct sun avoidance during high intense midday sun (i.e., 10 am to 3 pm) is essential. Individuals should be advised to plan outdoor activities around these times. Protective clothing (sunglasses, long sleeved shirts and pants that block the sun, broad brimmed hats) needs to be worn to protect the skin from the harsh SSA climate. Dermatologically tested sun care products with a Sun Protection Factor (SPF) that is tailored to suit individual needs should be used to protect the skin from sun damage. Some medication can increase the risk of skin sensitivity and sun damage, making prevention even more important.

Swallowing studies and trial feeding

Swallowing studies and trial feeding as directed by a speech-language therapist, in collaboration with the wider healthcare team, are typically used to ensure a nutritionally adequate diet for people living with HIV, based on texture and consistency. They can also assist in evaluating an individuals' ability to safely ingest oral food.

Visual loss - meal preparation, shopping and medication

Individuals with visual impairments and visual loss can be assisted with advice and education on meal preparation such as organizing work space and materials, adequately labeling dials and controls on appliances and, with the assistance of occupational therapists, on the safe use of assistive devices with kitchen utensils.

Similarly, shopping can be made easier by organizing lists according to store layout, asking store personnel for assistance, contact caregivers to assist with shopping, getting items delivered, and using magnifiers or penlights for reading labels.

Individuals can be educated about administration of medication by organizing them by time of day, identifying containers by shape and size, or using elastic bands, magnetic tape, coloured tape, or

marked contrasts in labels. The local pharmacy can also assist with alternative packaging (e.g., bubble packs).

Visual loss - referrals

For visual loss and assistive devices, referrals can be made to the specific country's association for blind/visually impaired people (e.g., The South African National Council for the Blind (SANCB)). Rehabilitation providers can give advice to individuals with visual impairments, including: ensuring the physical environment is free from obstacles, ergonomic advice, organizing clothing according to texture, and advice on food storage and meal preparation. Support should be provided for visually-impaired children returning to school.

Weight gain interventions

Individuals suffering from acute digestive and endocrine-related impairments should be referred for appropriate medical care. There are rehabilitation interventions that can assist individuals who want to put on weight, including: exercise (particularly strength training to build muscle mass), nutrition, rehydration and supplementation. Referral to community feeding schemes may be necessary in instances where individuals cannot afford adequate nutrition. Psychosocial rehabilitation or referral may be necessary when excessive weight loss is primarily related to psychological causes.

Weight loss interventions

Individuals suffering from acute digestive and endocrine-related impairments should be referred for appropriate medical care. There are rehabilitation interventions that can assist individuals who want to lose weight, including: exercise (particularly aerobic exercise to facilitate weight loss) and dietary advice. Referrals to community feeding schemes may be required for individuals who cannot afford alternatives to low-cost, high-caloric foods.

Characteristic features of protease inhibitor-associated lipodystrophy include increases in abdominal visceral adipose tissue, loss of facial fat, development of dorsocervical and supraclavicular fat pads and enlargement around the breasts in women.²¹ Adipose cells are not lost but are redistributed to areas around the viscera and within blood vessels. This redistribution, in addition to elevated triglycerides, increases the risk of developing cardiovascular disease and its complications. A combination of aerobic and strength exercise has proven beneficial in reducing the effects of body fat redistribution and improving the quality of lives of people living with HIV and this condition.^{22,23}

3.4 – What do rehabilitation providers need to know about their patients’ beliefs and use of traditional healers, spiritual leaders and alternative therapies outside the formal medical system?

There is great diversity of ethnic, cultural, language and religious groups throughout Sub-Saharan Africa. Health beliefs are closely interwoven with communities’ cultural and religious practices. It is vital that rehabilitation providers are aware of the influence of these beliefs on understandings of health and illness, which can affect uptake of (and adherence to) rehabilitation and medical advice.

Traditional healers

Sub-Saharan Africa is the region of the world most affected by HIV; it is also a region in which most people turn first to traditional healers when they fall ill. In this region, traditional healers outnumber medically qualified doctors eighty-to-one.²⁴ Traditional healers play an important role in responding to the HIV epidemic. Although few traditional remedies have been scientifically tested, it is possible that some of the advice and remedies given by traditional healers are effective in treating HIV-related opportunistic infections and drug side effects. However, like all medicine, these therapies may also do harm through side effects, drug interactions, or delaying use of conventional treatment.

When ill, individuals in Sub-Saharan Africa will often visit a traditional healer before, during or after seeking help from conventional Western practitioners. Furthermore, when they do receive Western treatment such as ARTs, adherence can be compromised due to conflicting messages they may receive from a traditional healer. Lack of understanding of HIV pathology is a further concern, in one study 21% of 233 traditional healers in KwaZulu-Natal, South Africa, believed there is cure for HIV.²⁵

It is crucial that rehabilitation providers work with traditional healers, where possible, both to understand what they do and to educate them regarding the importance of adherence to both medication and rehabilitation for people living with HIV. Collaboration between traditional healers and rehabilitation providers has the potential to improve safety, e.g., by encouraging better hygiene, and adherence to prescribed treatment. Training can also assist traditional healers in identifying illnesses beyond their capacity to treat, hastening referral to a clinic when necessary. A number of organisations (e.g., THETA in Uganda, TAWG in Tanzania, PATF in Zambia, and the iTeach Programme in South Africa) have demonstrated the benefits of collaborating with traditional healers in HIV prevention and care.²⁶

Spiritual leaders and religious beliefs

Throughout Sub-Saharan Africa, spiritual leaders are revered by large sections of the population and their advice and teachings are often strictly followed. There is an extremely wide array of both indigenous and orthodox religious belief systems throughout Africa many of which work in harmony with the health care system. However, many may be in conflict with Western medical advice. Some spiritual leaders may advocate that patients avoid or cease medical treatment and rehabilitation and instead adhere only to the beliefs of their religious sect in order to be "healed" of the virus. This may result in issues of non-adherence to ARVs and associated exacerbation of patients’ impairments. For example, among a prospective cohort of 442 people living with HIV in Tanzania, 56% sought a cure from a religious healer and their adherence to (ARVs) dropped precipitously after the visit.²⁷ Rehabilitation

providers must collaborate with spiritual leaders, providing advice and education where appropriate, in order to maximise the outcomes of treatment and rehabilitation.

Alternative therapies

Alternative therapy practitioners (excluding traditional healers) are less widespread in Sub-Saharan Africa, than elsewhere, particularly outside of urban areas. Alternative therapies can be divided into five main categories:²⁸

- Whole medical systems (such as Ayurvedic medicine and homeopathy)
- Mind-body medicine (such as yoga and tai-chi)
- Biologically based practices (such as herbal remedies, vitamins and minerals)
- Manipulative and body-based practices (such as chiropractic and reflexology)
- Energy medicine (such as Reiki and acupuncture)

Rehabilitation providers may employ several of these techniques (including tai-chi, yoga and acupuncture) and similarly, alternative therapists may employ techniques used by rehabilitation professionals. It is vital that rehabilitation providers and alternative therapists collaborate wherever possible, to ensure the best possible treatment for people living with HIV.

Who pays for these therapies?

The spiritual, traditional and alternative healers described above, in most cases, fall outside of public healthcare systems in Sub-Saharan Africa. Additionally, private healthcare institutions and insurers often provide little or no coverage for these practices. This can place additional financial strain on people living with HIV who seek advice and treatment from these healers.

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