EDITORIAL ARTICLE

GERIATRIC REHABILITATION IN AN AGEING WORLD: CHALLENGES, OPPORTUNITIES, AND THE FUTURE OF PERSON-CENTERED CARE

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INTRODUCTION

According to reports by the United Nations, the global population is ageing, although this growth may stabilize by the end of the century. By the late 2070s, the number of individuals aged ≥65 years is projected to reach approximately 2.2 billion—surpassing the global population of those under 18 years. By the mid-2030s, nearly 265 million individuals are expected to be aged ≥80 years, outnumbering infants. Even rapidly developing nations will experience substantial population ageing over the next three decades, necessitating strategic investments in health and long-term care systems, the sustainability of social protection mechanisms, and the development of emerging technologies (1).

As life expectancy increases, the prevalence of chronic diseases, functional impairment, and age-related physiological decline also rises. Consequently, geriatric rehabilitation has become a cornerstone of contemporary healthcare. Physiatrists—specialists in Physical Medicine and Rehabilitation—play a pivotal role in restoring function, maximizing independence, and enhancing quality of life in older adults with complex medical conditions.

Modern geriatric rehabilitation extends far beyond conventional therapeutic modalities. Older adults frequently present with multimorbidity, frailty, cognitive impairment, sensory deficits, polypharmacy, and social vulnerability—factors that necessitate a personalized, holistic approach integrating medical stabilization with functional recovery. Such an approach requires interdisciplinary collaboration and individualized rehabilitation pathways. Concurrently, global health systems face increasing pressures—shorter hospital stays, cost constraints, and workforce shortages—further underscoring the need for systematic, evidence-based rehabilitation practices.

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Recognizing the Unique Clinical Challenges in Older Adults

Older adults commonly present with atypical and nonspecific symptoms that complicate diagnosis and treatment planning. Manifestations may include generalized symptoms such as reduced activity, remaining in bed, or diminished oral intake, rather than symptoms localized to a specific organ system. Underreporting of symptoms—such as hearing loss, urinary incontinence, constipation, nocturnal leg pain, and cognitive changes—is also frequent, since these issues are often misattributed to normal ageing.

Multimorbidity and diminished physiological reserve across multiple organ systems contribute to atypical disease presentations and unpredictable therapeutic responses. Polypharmacy adds further complexity. During history-taking, clinicians must thoroughly review prescribed, over-the-counter, and supplemental medications, as discrepancies between prescribed and actual usage are common (2).

GERIATRIC REHABILITATION

Geriatric rehabilitation is emerging as an essential component of healthcare worldwide. Hospitalization rates rise with age, and functional decline during hospitalization represents a major concern: approximately 30% of patients aged ≥70 years develop hospitalization-associated disability, increasing to 40% among frail individuals. Many older adults do not regain pre-hospitalization functional levels or return home following discharge. Consequently, rehabilitation needs rise sharply after age 65, though the duration, content, and structure of rehabilitation programs vary considerably across countries (3).

The global increase in older adult populations underscores the importance of preventive strategies and structured rehabilitation programs. In many low- and middle-income countries, reducing hospital stays and promoting "ageing in place" have become central policy goals. Efficient resource allocation requires identifying those most likely to benefit from timely, context-appropriate, and high-quality rehabilitation interventions (4).

The World Health Organization Definition Within the ICF Framework

The World Health Organization (WHO) defines geriatric rehabilitation as "a multidimensional approach consisting of diagnostic and therapeutic interventions aimed at optimizing functional capacity, promoting activity, and maintaining functional reserve and social participation in disabled older adults." Its major objectives include improving activities of daily living, enhancing social engagement, and strengthening overall quality of life. Chronological age, cognitive impairment, or place of residence should not be used as exclusion criteria for rehabilitation participation (5).

Unlike disability in younger adults—typically arising from discrete injury or disease—functional decline in older adults often develops subacutely, without a clear precipitating event. Hospitalization and immobility further increase risks for complications such as infections, pressure injuries, and delirium (5).

SUCCESSFUL REHABILITATION

Principles of a Successful Rehabilitation Program

Key principles are summarized in Table 1, including early initiation of rehabilitation, thorough functional assessment, collaborative goal-setting, realistic expectations, and active patient participation. Rehabilitation planning must also address psychological well-being, support needs, and minimization of unnecessary medications.

Essential aspects include (A) individualized treatment planning and (B) comprehensive pre-rehabilitation assessment (Table 2), encompassing physical examination, sensory and continence evaluation, gait and mobility assessment, nutritional status, functional capacity, mental health screening,

Table 1. Principles for a Successful Rehabilitation Program

1. Rehabilitation should begin as early as possible.
2. The patient's functional status must be thoroughly assessed.
3. Realistic goals should be established collaboratively with the patient and their family, with expectations clearly communicated.
4. Restoration of function should be prioritized; if this is not achievable, an appropriate and sustainable functional balance should be established.
5. The patient, family, and healthcare team should jointly determine the most appropriate rehabilitation setting.
6. A structured and goal-oriented rehabilitation plan should be developed.
7. The patient should be encouraged to actively participate in all stages of the process.
8. The patient's psychological status should be assessed, and appropriate support should be provided.
9. Clear evaluation criteria for follow-up and outcome assessment should be defined.
10. Polypharmacy should be avoided, the number of medications prescribed should be minimized whenever possible.
11.The rehabilitation team should remain up to date with emerging technologies and participate in continuous professional development.

Table 2. Core Considerations

Planning must be individualized	1- Reduced physiological capacity must be taken into consideration. 2- The program should address the person's specific needs and be customized to their particular medical condition (e.g., hip fracture, stroke). 3- The goal is to achieve the targeted level of functional status. 4- Throughout the process, factors such as fatigue, medical stability, and level of participation should be closely monitored. 5- Additionally, a post- discharge rehabilitation plan should be established.
A comprehensive assessment should be conducted before initiating rehabilitation.	1- Physical health (History taking, physical exam, assessment of visual and auditory functions) 2- Continence assessment 3- Evaluation of gait, mobility, and fall risk 4- Nutritional assessment 5- Functional capacity (Activities of daily living, instrumental activities of daily living, performance measures) 6- Mental health (Cognitive screening and assessment, depression screening and assessment) 7- Social support (Social history, assessment and referral of support systems, caregiver burden, financial status) 8- Environmental adequacy

social and environmental assessment, and support evaluation.

Goal-setting is optimized by applying the SMART framework—Specific, Measurable, Achievable, Relevant, and Time-limited (6).

Determinants of Patient Satisfaction

Patient satisfaction in geriatric rehabilitation depends on appropriate information provision, opportunities for self-expression, physical and psychosocial support, shared decision-making, motivational environments, and structured home-based rehabilitation with regular follow-up (7).

Additional determinants are listed in Table 3, including patient-centered communication, interdisciplinary teamwork, professional competence, clear information exchange, and adequate organizational infrastructure. From the healthcare provider perspective, two primary outcome indicators determine rehabilitation quality: (A) achievement of rehabilitation goals and (B) patient satisfaction at discharge (8).

CHALLENGES

Common Health Challenges in Older Adults

Older adults typically experience multiple interrelated conditions rather than a single disease. Common challenges include chronic illnesses (e.g., arthritis, hypertension, diabetes), cognitive decline, polypharmacy, mental health disorders, malnutrition, and sensory impairments (Table 4). These underscore the necessity of integrated, multidisciplinary rehabilitation models.

Current Systemic Challenges in Geriatric Rehabilitation

Major obstacles include:

1. Rapid population ageing and rising demand for specialized rehabilitation services.
2. Multimorbidity and comorbidities complicating clinical decision-making.
3. Cognitive impairments that limit participation and communication.
4. Resource constraints, including workforce shortages and inadequate funding.
5. Technological barriers limiting digital access for older adults.
6. Social and environmental barriers, including isolation and non-adaptive living environments.

Nevertheless, these challenges simultaneously present opportunities for innovation and system transformation.

Table 3. Additional Factors Influencing Rehabilitation

Patient-centered approach	Effective communication between the patient and the healthcare team
Patient satisfaction	Involving the patient in assessments & taking their perspectives into account
Therapeutic environment	Should ensure that patients feel safe and secure
Caregivers	Provision of information to the patient and informal caregivers
Consultation	Consultation regarding the rehabilitation process
Collaboration	Interdisciplinary collaboration within the rehabilitation team
Professionalism	Professionalism of the team members
Organizational aspects	Allocating sufficient time for appropriate planning

Table 4. Common Health Challenges in Older Adults

Chronic Conditions	Arthritis, hypertension, diabetes, heart disease, and osteoporosis.
Cognitive Decline	Increased risk of dementia, including Alzheimer's disease.
Polypharmacy Risks	Increased side effects and interactions due to multiple medications.
Mental Health Issues	Depression, anxiety, and loneliness are prevalent but underdiagnosed.
Malnutrition & Weight Changes	Often due to reduced appetite, dental issues, or difficulty preparing meals.
Sensory Impairments	Vision (e.g., cataracts, macular degeneration) and hearing loss.

OPPORTUNITIES

Advancing Geriatric Rehabilitation

Emergent strategies include:

1. Preventive rehabilitation and targeted lifestyle modifications to delay functional decline.
2. Interdisciplinary care models integrating all relevant health professionals.
3. Community-based programs fostering physical activity and social engagement.
4. Supportive policy initiatives and investment in ageing-friendly systems.
5. Telehealth and remote rehabilitation, enhancing access in underserved regions.
6. Technological innovations, including Artificial Intelligence (AI)-based personalization, wearable devices for continuous monitoring, and virtual reality rehabilitation.

AI offers significant clinical, social, and economic potential (Table 5), though its ethical application mandates careful regulation (9).

AI, Ageism, and Future Considerations

The WHO highlights persistent ageism embedded within AI systems. Older adults remain underrepresented in training datasets, leading to biased algorithms. Furthermore, technologies are frequently designed *for* rather than *with* older adults (10). Equitable AI use requires appropriately representative datasets, inclusive policies to prevent digital exclusion, and active participation of older adults in ethical review, regulatory, and standard-setting processes (9,10).

RETHINKING GERIATRIC REHABILITATION

Future directions should include:

1. Addressing existing gaps, particularly the persistence of "one-size-fits-all" rehabilitation models.
2. Advancing personalization through data-driven but human-centered decision support systems.
3. Fostering innovation that integrates emerging technologies without eroding human connection.
4. Promoting equity and ensuring accessibility across rural, low-income, and marginalized populations.

Healthy ageing emphasizes not merely life prolongation but the preservation of dignity, autonomy, and meaningful engagement—core goals of effective rehabilitation.

Ethical and Legal Dimensions

The integration of new technologies into geriatric rehabilitation must uphold privacy, autonomy, informed consent, and dignity. Technology should serve to complement—not substitute—the human relationships central to rehabilitation. Ethical concerns encompass autonomy, potential age-related discrimination, and disparities in access; legal issues include accountability for technological failures and maintaining data confidentiality within gerontechnology.

Table 5. AI offers significant potential across multiple domains

Medically	AI enables early detection and personalized management of age-related diseases through predictive analytics and diagnostic tools, thereby improving health outcomes and autonomy.
Socially	From a social perspective, AI-powered technologies such as virtual companions and communication aids can mitigate loneliness and cognitive decline, fostering social engagement among older adults.
Economically	AI-driven systems can optimize eldercare services and resource allocation, supporting caregivers and reducing societal costs.

FINAL WORDS

In older adults, the primary goal of rehabilitation extends beyond functional restoration to the holistic enhancement of quality of life through comprehensive, problem-solving approaches. However, access to rehabilitation remains unequal across socioeconomic, cultural, and geographic contexts. Sustainable progress requires embedding rehabilitation into health policy frameworks while maintaining a person-centered philosophy.

Despite significant challenges—multimorbidity, limited resources, and digital inequities—substantial opportunities exist to strengthen geriatric rehabilitation worldwide. Prioritizing personalized care, community-based initiatives, preventive strategies, and ethically grounded technological innovation can markedly improve quality of life for older adults in an increasingly ageing global population.

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