Editorial

The role of exercise in rehabilitation

*Lack of activity destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it.*

More than two thousand years after Plato wrote that sentence we established that it was true for people who were not ill, and more recently we have started to establish that it is also true for people with long-term conditions. Given the increased interest in exercise in rehabilitation, this special issue of *Clinical Rehabilitation* focuses upon the role of exercise in rehabilitation.

Introduction

The scientific evidence for the benefits of regular participation in physical activity for healthy adults and children is compelling. Physical activity contributes to well-being and good health for all. More, the risks associated with participating in physical activity at levels that promote health and well-being are low. People who are physically active reduce their risk of developing major chronic diseases, including coronary heart disease, stroke and type 2 diabetes by up to 50%, and the risk of premature death by about 20–30%. Indeed, there are many systematic reviews and meta-analyses in the Cochrane Collaboration that show that exercise benefits most people and in many ways.

However, there has been much less research investigating the benefits of exercise for people with chronic disabling disorders. Most research in rehabilitation has measured outcome at a functional outcome level (e.g. walking performance or other activities of daily living). The available evidence suggests that people with disabling chronic disorders are no different from healthy people in their response to exercise and the benefits that may accrue.

Nonetheless there are still many questions about exercise in rehabilitation and for people with disabilities that need answering. For example:

- How is exercise best measured?
- How should exercise be undertaken?
  - Are some modes of exercise more or less beneficial (e.g. cycling, walking, circuits)?
  - Where is it best undertaken (e.g. at home, in a public gym, at hospital)?
  - What professional input is needed?
  - What social setting is better (e.g. group or individual sessions)?
  - What content is optimal (e.g. aerobic, anaerobic, flexibility or balance)?

- What are the benefits of exercises?
  - On the activities that are limited (e.g. walking, working)?
  - More generally (e.g. fatigue, mood, vascular disease, etc.)?

- What risks and harms are associated with exercise in people with disabilities?
  - Should fatigue be a reason for limiting exercise?
● What specific (contextual) factors influence participation in exercise?
  - In the physical context (environment)?
  - In the social context (attitude of others, support)?
  - In the personal context (beliefs about risk and harm, mood, etc.)?

This special issue of Clinical Rehabilitation has a selection of papers that address many of these questions.

A central tenet driving physical activity strategies in healthy populations has been the use of simple fitness and activity targets (such as achieving a particular heart rate or counting steps) that can be utilized by anyone in any setting. However, measuring and targeting activity and fitness in people with chronic disabling conditions using models of exercise prescription and monitoring developed for healthy individuals may not be appropriate or accurate, and continue to present a challenge.

Evidence of poor validity of some measures used in healthy populations (such as pedometers) and technological advances have resulted in a number of measures being developed for both research and clinical use, as reported within this special issue. However, although the utility of measures of function and impairment, such as those of muscle strength and walking style, to predict movement disorders, health, mood, cognition and emotional state have been shown, only a limited number have found their way into mainstream clinical use within the rehabilitation setting.

There is much more work to be done in validating, modifying and adapting such measures for clinical use. The gradual emergence of a confusing array of devices that have the ability to quantify accurately the quality of motion and activity levels for clinical populations necessitates acquiring more evidence concerning:

● Which aspects of motion and activity (e.g. speed, intensity, smoothness, symmetry or effort components) are important for daily functions?
● Can markers such as strength or walking parameters be used to predict change in performance?
● What measures/markers will best predict future function, health and well-being?

We see the importance of using physiological measures in ensuring effective clinical practice within this issue. Exercise dose response and effect at an activity or participation level may be dependent on the threshold level of ability in body functions, such as strength, flexibility, endurance and cognition. However the relationship of impairment to function and response to rehabilitation is not clear in many conditions. In a limited number of studies, simple markers such as age and baseline ability have been shown not to predict response to exercise interventions. To date, limited information is available on the ability of movement markers to accurately determine or predict function. Within this issue the threshold level of muscle strength as a predictor of activities of daily living is explored.

There are challenges for clinicians when advising on physical activity prescription in people with chronic conditions. While the message concerning physical activity targets for healthy children and adults is clear there is no clear evidence about the most appropriate content of exercise interventions for many clinical conditions. The direction within guidance statements and texts for exercise prescription given for many conditions is developed from consensus and expert opinion. Thus, while research evidence exploring exercise prescription in healthy populations is extensive, safe, minimal and expected exercise dose responses are not clearly described in most clinical groups.

Practical issues of disease processes (progressive, acute onset with recovery of varying levels or intermittent episodes) and the different levels of disease severity present difficulties for both researchers and clinicians. The development of strong research evidence in this area is further hampered by problems of studying adequate sample sizes, particularly in less common conditions. The challenge of recruiting enough participants to studies is appreciated by all rehabilitation researchers and the frustrating conclusion of much of the output from the Cochrane Collaboration in this area is often that of underpowered research.
Finally, if adopting an approach to exercise prescription similar to drug prescription, the possible combination of variables affecting the dose is huge and researchers are faced with deciding which are the most important components to investigate and develop evidence concerning:

- the exercise component (cardiovascular, muscle endurance, power, strength, speed, balance or flexibility components or a combination of these),
- the activity (walking, swimming or an activity that has a social emphasis) and finally
- the dose (how often, long and hard).

The observation of actual activity levels that are lower than those currently recommended for the general population indicates there are barriers to being active for all of us. How many of us exercise regularly five times a week for 30 minutes? Many countries now have policies to attempt to increase general participation in physical activities (such as free swimming for children in the UK) in order to tackle major worldwide diseases such as cardiovascular disorders, obesity and type 2 diabetes.

We know that there are additional, very real difficulties faced by disabled populations trying to participate in exercise interventions and being active in their everyday lives, including practical, emotional, societal barriers (stigma) and beliefs (both patient and others). While there are policies to increase activity levels in the population as a whole, there are limited targets to increase activity for people with disabilities.

Some barriers require strategic consideration and funding, such as those addressed by the Inclusive Fitness Initiative (http://www.inclusivefitness.org/), a charitable programme initiated in the UK now gaining global coverage, to support the fitness industry to become more inclusive and cater for the needs of disabled and non-disabled people.

Other practical issues may need tackling with governmental policies, such as ensuring the availability of adequate affordable transport systems for people with disabilities. In this issue we see evidence of a range of novel approaches that have attempted to address practical barriers to participation in both rehabilitation and fitness programmes, by using different community settings and timings of delivery for interventions.

Current research supported by the Department of Health in the UK is utilizing a combined medical/social model to encourage physical activity uptake and maintenance in a community setting with people with complex neurological conditions. The physical activity support system, while encouraging an expert patient self-determined approach to exercise, does provide medical support for optimal safe prescription. Its effectiveness has yet to be shown.

Despite strong evidence that physical activity is a powerful moderator benefiting health and well-being in healthy populations, safe, optimal physical activity levels are not known for many clinical conditions. People with disabilities report that they enjoy exercise and want to have the same opportunities to participate in a range of sporting and exercise activities as able-bodied individuals. Thus it is clearly important to improve our understanding of exercise interventions both in people who are not ill and in people with long-term conditions, including those in active rehabilitation. Answering these questions in clinical populations is challenging and requires multidisciplinary research with exciting and elegant research methods as presented within this special issue. It is hoped that in ten years’ time we will be able to advise specific exercise programmes tailored to the needs and abilities of each person with a disability, knowing that they are able to access suitable facilities and will follow the advice.

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References


