INTRODUCTION

The challenge in Parkinson’s disease (PD) is to control the dynamic balance between the rate of neuronal death, the worsening of clinical features and the rapidly fluctuating response to pharmacological treatment.

Over the last 20 years, many attempts have been made to demonstrate the efficiency of a broad spectrum of non-pharmacological approaches to the management of PD-related disability.

Recent proposals from different groups stress the need for a comprehensive medical and non-medical management of PD patients that slows the disease progression, delaying the onset of dependence and reducing the burden of care. In 1993, Homberg (1) defined the goals of physical therapy as being the prevention of tertiary damage (i.e. sequelae of immobilisation) and the improvement of voluntary movements, of quality of life and of social activities. More recently, Olanow and Koller (2) have identified four domains of non-pharmacological management of PD – Education, Nutrition, Support and Exercise – designed to help patients cope with their disability.

The PILS rehabilitation project, mean-
while, establishes four target areas: Prevention, Independence, Lifestyle and Social Resources (3).

Both Olanow and Koller (2) and the PILS project point to a “global pragmatic approach” to PD. Alternatively, the so-called “eclectic” approach can be considered. This does not include stereotypic techniques, but instead tailors procedures to the single patient’s needs and expectations (4).

Unfortunately, most PD rehabilitation trials giving positive results are handicapped by poor methodological quality; this makes it difficult to compile systematic reviews providing conclusive evidence of the efficacy of any given protocol (5).

We attempted an analysis of available studies in order to extrapolate the following recommendations, labelled according to evidence-based medicine suggestions (6) and classified as falling within either the pragmatic or the eclectic approach.

GUIDELINES TO PREVENT DISABILITY ONSET AND PROGRESSION IN PD.

A) The global pragmatic approach

1st domain: education.
Greater knowledge of the disease can help to reduce alarm and anxiety, improving the ability to cope with emerging disability.

This may be assumed to be a Grade B recommendation, supported by a 2b level of evidence (6).

At least two randomised controlled trials (RCTs) show how an education programme (PROPATH) is effective in: improving patients’ perception of their health, in providing information and support and in promoting patients’ cooperation with the physician in order to achieve the best medical treatment (7,8). The 12-month follow up confirms the role of PROPATH in helping patients deal with the psychological aspects of PD, but fails to demonstrate any effect on resource utilisation: in other words, it shows how education changes the attitude of patients towards disability, but does not decrease their needs.

2nd domain: exercise promotion.
Exercise training increases exercise tolerance and limits disability.

This is a Grade B recommendation, supported by both RCT and case-control studies.

An 8-month home exercise regimen for PD patients proved effective in promoting self-care in activities of daily living (ADL) (9). Participation in a 12-month aerobic exercise programme has been shown to improve fitness and increase habitual activity level (10). Both trials were conducted on ambulatory (i.e. Hoehn & Yahr stage ≤ III) subjects.

A more recent report (11) showed the efficacy of a 5-week exercise training programme, including pulmonary rehabilitation techniques and unsupported upper extremity exercises, on both pulmonary function parameters and exercise tolerance.

3rd domain: support.
Group therapy should be considered as a means of improving social contacts, motivation and quality of life.

The above is a Grade B recommendation. Two RCTs, conducted 10 years apart, highlighted the effectiveness of a group approach in improving motor symptoms and quality of life in PD patients (12,13). The techniques applied were different, the former trial involving occupational therapy, and the latter using an interdisciplinary treatment including physical exercises, leisure activities, handicrafts and art therapy. Long-lasting benefits are described only by Gauthier et al. (12). A subgroup analysis, taking into account the highest efficacy of group therapy on depressed subjects, stresses the hypothesis that such an approach promotes social interaction, in particular, and that it in-
creases perception of wellbeing rather than improving motor function (13).

4th domain: nutrition. 

*PD patients should undergo regular screening of swallowing abnormalities, from Hoehn & Yahr stage II on, in order to assess dysphagia, detect silent aspiration and establish the possible need for referral for speech therapy.*

The above is a Grade B recommendation.

Complaints of dysphagia (food, liquids and tablets) are significantly higher in PD patients compared with age-matched controls (14,15), abnormal swallowing being prevalent in about 30% of cases. The decline in swallowing speed worsens as the Hoehn & Yahr score increases. Dietary advice can be given and airway protection techniques taught to those requiring them in order to prevent aspiration (2). Changes in the timing of antiparkinsonian medication may improve dysphagia (16).

B) The eclectic approach

1. HOW to cope with speech problems.

*Oral communication may be improved through intensive voice rehabilitation programmes.*

The above is a Grade C recommendation. Long-term benefits lasting 1 year after treatment completion, may be achieved using speech therapy based on intensive voice and respiration training (17). A one-month treatment (with a 4-session-per-week schedule) has a positive impact on vocal intensity, and hence, on communication skills, thereby improving the psychosocial wellbeing of PD patients.

2. HOW to cope with the risk of falls.

*Teaching conscious strategies for overcoming obstacles to movement is an effective treatment for managing the problem of falling.*

The above is a Grade C recommendation. According to Koller et al. (18), 10% of PD patients fall more than once a week. Furthermore, they are five times more likely to suffer fall-related fractures (19) and nine times more likely to fracture their hips than healthy older adults (20).

Occupational therapy is aimed particularly at teaching patients how to manage developing disability and should be considered for PD patients experiencing falls.

However, among the many trials addressing the efficacy of occupational therapy in advanced PD only a few address the problem of controlling the risk of falls. Yekutiel (21) has described the benefits of a tailored approach – whose aim is to teach conscious strategies to overcome the problem – in which the time and location of falls are recorded using plans of patients’ apartments.

3. HOW to cope with freezing.

*Freezing can be reduced by the use of visual/auditory cues.*

The above is a Grade B recommendation. Gait deficits are the most characteristic and most functionally disabling signs of PD. They are often resistant to pharmacological treatment despite the general effectiveness of dopaminergic drug therapy.

A growing number of studies point to the usefulness of an educational approach. This kind of approach aims to overcome the defective automatic planning of movement, typically seen in PD patients, by means of taught conscious strategies designed to render motor plan rules explicit.

The use of rhythmic auditory cues may improve gait velocity, cadence and stride length after a few weeks’ training (22), but there is no carry over when cues are removed.

Freezing can be helped by techniques that involve the use of sensory or mental imagery. Thus, a patient with start hesitation may be taught to circumvent this inhibition using strategies such as: taking steps towards a target on the ground, stepping over a cane, taking the first step with a long-striding military
gait (18), and using an inverted walking stick (23).

PD patients experience many other problems besides the three reported above. In particular, pain arising from stiffness, muscle spasms and bradykinesia are all causes of disability that contribute to poor quality of life. However, few clinical trials have selectively addressed the need to search for a solution to these problems and, of those that have have, none has produced any conclusive evidence on the efficacy of a given approach.

Recent reports by Deane et al. (5,24,25) highlight the lack of evidence-based strategies aimed at reducing PD-related disability using either physical or occupational or even speech therapy.

FUTURE PERSPECTIVES: THE THEORETICAL/SCIENTIFIC BASIS OF SINGLE STRATEGIES

There is a growing need to scrutinise PD rehabilitation approaches according to the evidence-based treatment and outcome efficacy parameters that are applied to other means of therapy.

Research on the pathophysiology of motor dysfunction in PD is being carried out in order to provide a solid theoretical background in support of rehabilitation approaches.

Recent guidelines (26) summarise as follows current knowledge of basal ganglia functional deficits:
1. Normal movement is possible in PD, all that is required is activation;
2. Movement sequences should be broken down into smaller components;
3. Attention processes should be used to think each movement component through consciously;
4. Cues should be used to initiate and maintain movements;
5. Simultaneous tasks should be avoided.

CONCLUDING REMARKS

Over the last ten years there has been a significant shift of attention towards the appropriateness of the non-pharmacological management of PD patients, although much work is still to be done. Recommendations on how to provide reliable treatment protocols should be mutated from evidence-based medicine. The following guidelines, produced by the Cochrane reviewers (5), could be useful for those wishing to undertake a rehabilitation efficacy trial in PD:

- Firm diagnostic criteria should be used.
- Inclusion and exclusion criteria should be clear and trials should aim to enrol uniform cohorts of PD patients.
- Investigators should clarify at what stage of the disease rehabilitation treatment is being evaluated.
- Trials must have sufficient numbers of patients to avoid false negative conclusions.
- Trials must include an adequate placebo control group and a clear description of the therapeutic intervention.
- The patients should be followed up for at least 6 months after treatment to assess the duration of any benefit derived from the intervention.
- Regardless of the assessment scale used, trials should report whether scores of impairment and disability refer to the “on” or “off” phase.
- Suitable outcome measures should be chosen so that the efficacy and effectiveness of rehabilitation can be assessed and an economic analysis can be performed. Outcomes which have meaning to patients should be used wherever possible since they need to know the value of their treatment in practical terms.
- The data must be analysed on an intention-to-treat basis and the change in an outcome measure must be compared statistically across the two therapy groups.
REFERENCES

5. Deane KHO, Ellis-Hill C, Clarke CE, Playford ED, Ben-Shlomo Y. Cochrane systematic reviews of physiotherapy for Parkinson’s disease. Mov Dis 2000;P 829 (abstract)


