The Keeping Moving Parkinson’s Exercise Programme
A rationale for physiotherapists and other health and social care professionals

In 2003, the Parkinson’s Disease Society produced Keeping Moving, an exercise programme for people with Parkinson’s disease, devised by Bhanu Ramaswamy MCSP and Richard Webber MCSP, two senior physiotherapists in Sheffield. This information sheet explains the rationale behind the programme. Although aimed mainly at physiotherapists, it may also be of interest to other health and social care professionals working with people with Parkinson’s.

The evidence for physiotherapy intervention in Parkinson’s
The evidence available to practitioners with regard to appropriate physiotherapy intervention for people with Parkinson’s up until the recent Rescue Project randomised control trial has either been of poor quality or absent. Physiotherapy has therefore had to rely on unsubstantiated anecdotal reports from professionals, people with Parkinson’s or carers regarding the effectiveness of input.

An effectiveness bulletin on neurological conditions (Chartered Society of Physiotherapy 2001) concluded that many areas of physiotherapy had yet to be sufficiently evaluated. This was a reflection obtained from several reviews comparing two or more therapeutic interventions or placebos with a treatment intervention, such as the two Cochrane systematic reviews (Deane et al, 2001 a and b) and that of Reuter & Engelhardt (2002). These reviews cannot be read to imply lack of effect, as all were inconclusive regarding the effectiveness of physiotherapy interventions with no clear statistical or clinical evidence to prove the benefit from training.

The papers critiqued in this information sheet and other books read in the course of its development continue to theorise improvements expected from physical interventions, despite the lack of supporting evidence.

Another issue that becomes apparent in the papers reviewed is the lack of agreement about what is a ‘standard’ form of physiotherapy or what might constitute ‘best practice’. Deane et al (2001 a and b) suggest that the capability of ‘standard’ physiotherapy should be proven first before examining variations in physiotherapeutic methods.

Clinical symptoms of Parkinson’s that may be influenced by physical therapies
Considering the World Health Organization’s classification of consequences of disease (1980), physiotherapy has most effect on the management of disabilities (abilities), impairment (participation) and health of someone with Parkinson’s compared with anti-Parkinson’s medications that influence the disability. Physiotherapy is therefore advocated in combination with optimal timing of the effect of medications (Morris et al, 1998).

During the development of the Keeping Moving programme, articles on other styles of exercise (anecdotally recognised as having a positive effect on Parkinson’s) were sought for review. These included the Alexander technique.
(Stallibrass, 1997), Pilates (Reyneke, 1993), conductive education (Kinsman, 1986, Kinsman et al, 1988; Brown, 2000) and tai chi (Li et al, 2001; Jancewicz, 2001; Lan et al, 2000; Hong et al, 2000) although not all looked specifically at Parkinson’s. Underlying themes common to them all seemed to be the use of cognition to promote posture and body awareness or control of movement with emphasis on slow, flowing movements. All were timed with breathing to induce relaxation. These core principles follow a rationale put forward by both Morris (2000) and Schenkman et al (1998) that suggest focusing on postural control during movement.

Original plan for the exercise programme
The Keeping Moving programme was originally designed as an exercise class. As well as improving/maintaining physical function (Ward, 1992), the aims of group therapy should be to lessen the social impact of impaired communication; increase confidence; improve motivation to communicate; restore a sense of control and provide a supportive framework for the participants over a period of months or years. A person can also do these exercises in their own home on an individual basis if a class is not available, which is why we have produced a DVD and booklet containing the programme.

It is recommended that people should do 30 minutes of moderate exercise at least five times a week, if not on a daily basis (American Council on Exercise, 2000). As gait pattern and disability levels in Parkinson’s subjects were shown to remain stable over a one-week period with optimal medication (Urquhart et al, 1999) we proposed that there would remain sufficient benefit from some of the exercises even if a person with Parkinson’s only did this regime once a week.

Following this point, exercising routinely can be an issue (Bassett & Petrie, 1999; Crook et al, 1998; Williams and Lord, 1995). These studies concluded that compliance is increased if the participants self-referred (as was the case for the participants in the class and those obtaining the DVD themselves) and if there was an emphasis on social interaction.

Finally, best practice would dictate a holistic exercise regime. As Sheffield has a good speech and language service for those who require work on facial muscle tone and voice production/amplification, the content of the proposed class could concentrate on a more defined aspect of postural control.

Specialist physiotherapists from four centres in Bath, Newcastle, South Shields and Southampton (recognised nationally by others in their profession for their interest and research in Parkinson’s and with experience of running exercise classes for people with Parkinson’s) were contacted during the course of preparing our routine. All programmes included:

- work on postural awareness
- techniques to correct poor posture
- control of movement, including the trunk and limbs
- exercises for weight transference and balance, requiring that people with Parkinson’s exercise at a cognitive level

The therapists who ran the classes reported that they had based the sessions on their clinical expertise and current knowledge of evidence of best practice.
The exercise regime
The Keeping Moving programme has been based on this concept of action systems of motor control described above and three therapeutic models outlined as follows:

1 The Movement Enablement Through Exercise Regimes and Strategies (METERS) advocates the promotion, maintenance and use of quality functional performance by focusing on four core areas of physiotherapy practice – gait, balance, posture and transfers outlined in Plant et al (2000) and detailed further in the Guidelines for Physiotherapy Practice in Parkinson’s Disease (Plant et al, 2001).

2 A model put forward by Morris (2000) for physical therapists promotes a task-specific approach to training in the context of functional tasks.

3 A rationale for the management of individuals with Parkinson’s by Schenkman et al (1989 and 1998), uses a systematic approach to evaluate, interpret and treat people with Parkinson’s.

The Keeping Moving programme emphasises minimising musculoskeletal limitations and postural deformities in order to preserve the individual’s capability for independent function as long as possible. Clinically, the authors have found rotation useful in inducing relaxation and decreasing rigidity. It is also a necessary part of balance reactions and functional activities.

The programme makes practical use of activity from two separate motor control systems: the medial system (concerned primarily with axial musculature contraction and extensor innervation) necessary for postural and anti-gravity work; and the lateral system (concerned with distal limb movements and flexion innervation) which is necessary for speed and agility in movement (Buchwald, 1967; Kuypers, 1964). Recruitment of individual muscles and synergies of movement according to this theory can be seen in the clinical context in the work done on functional stability in movement (Comerford & Mottram, 2001a and b).

It is hypothesised, therefore, that the effects of following this system of relaxation, breathing control and slow, controlled movement at a conscious level should be twofold – in physical terms, there could be benefits from better posture (and therefore balance and respiratory status) as well as control of movement (with subsequent influence on delayed progress from poverty of movement on physical function e.g. transfers, gait). In psychosocial terms, the group intervention will have a positive effect on aspects of the disease, for example health and social participation, while better physical ability will lead to improvements in confidence and independence.

The exercises progress through postural sets of lying, sitting and standing. Work on core stability and single limb range of movement in lying progresses to more complex sequences involving bilateral or diagonal limb movements where the base of support is progressively decreased and the complexity of the movements increased. Elements of strengthening, balance, co-ordination of movements and flexibility are incorporated into the exercises and most of the exercises are synchronised with breathing. All are done at a cognitive level and with auditory cues (Morris et al, 1999; Chartered Society of Physiotherapists, 2001; Plant et al, 2001).

Morris (2000) points out that there is little use in working on individual symptoms if the
training does not relate to functions such as standing and walking, so the final exercises concentrate on aspects of stepping and sit-to-stand control, hopefully resulting in modified or use of skills to gait and transfers. The table at the end of this information sheet summarises the exercises recommended and the aims behind the movement.

No specific bed mobility or floor transfer exercises are done, as the task of getting on to and off the floor to perform the lying exercises requires similar skills. The therapist assists and instructs the person in how to get on or off the floor as necessary.

All the exercises can be modified should the person with Parkinson’s experience difficulty in any one postural set. Some of the standing exercises are done with arm support if the person is very unstable, or sitting where their bottom becomes the base of support.

Throughout the sitting and standing exercises, maintenance of best postural alignment is stressed.

Obtaining the programme/further information
The Keeping Moving programme is available to order, free of charge, from:
Sharward Services Ltd
Westerfield Business Centre
Main Road
Westerfield
Ipswich IP6 9AB
Tel: 01473 212115
Email: parkinsons@sharward.co.uk

The booklet is also available to download on the PDS website at www.parkinsons.org.uk

References and bibliography


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Williams P & Lord, S (1995) Predictors of adherence to a structured exercise programme for older women, Psychology and Aging 10(4),617–624


A summary of the exercises in the proposed class, their aims and source

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Aim</th>
<th>Literature</th>
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<tbody>
<tr>
<td>Relaxation</td>
<td>Reduces daily tensions prior to exercising, heightens awareness of the different parts of their body and starts to decrease rigidity to allow increased flexibility</td>
<td>Franklyn 1986, Schenkman et al 1998, Morris et al 1999, Body control pilates</td>
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<tr>
<td>Breathing exercises</td>
<td>Further reduces tension and increases vital capacity of the lungs</td>
<td>Schenkman et al 1998</td>
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<tr>
<td>Exercises in lying</td>
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<tr>
<td>Neck rolling</td>
<td>To increase range and freedom of movement of head on trunk to aid increased visual input and balance (anticipatory and reactionary strategies). Encourages posture/positioning of the head.</td>
<td>Weinrich et al 1988, Schenkman et al 1998, Di Fabio 1997</td>
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<tr>
<td>Pelvic tilt</td>
<td>To improve range and smoothness of movement in pelvis for activities of weight transference eg sit to stand, walking. Strengthens axial muscles used for core stability</td>
<td>Norris 1995</td>
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<tr>
<td>Knee opening</td>
<td>Core (axial) stability whilst controlling movement and range of a single limb also stabilises the pelvis in transverse plane.</td>
<td>Norris 1995, Hodges et al 1997 &amp; 2000</td>
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<tr>
<td>Leg stretch</td>
<td>Progression of the knee lift but increasing core stability control as controlling a fully lengthened limb (long lever). Pelvic stabilisation</td>
<td>Norris 1995, Hodges et al 1997 &amp; 2000</td>
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<tr>
<td>Arm reaching</td>
<td>Single limb arm stretch for range to arm, shoulder girdle complex (including the scapula) and thoracic spine</td>
<td>Norris 1995, Hodges et al 1997 &amp; 2000</td>
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<tr>
<td>Arm and leg stretch</td>
<td>Increased complexity with dual tasks to control opposing limbs for core stability and diagonal limb range</td>
<td>Norris 1995, Hodges et al 1997 &amp; 2000</td>
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<tr>
<td>Knee rolling</td>
<td>Increase range and freedom of trunk rotation</td>
<td>McNiven 1986, Schenkman et al 1998</td>
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<tr>
<td><strong>Exercises in sitting</strong></td>
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<tr>
<td>Sitting posture</td>
<td>Posture maintenance with mental rehearsal of good alignment for sitting and standing tasks</td>
<td>Franklyn 1986</td>
</tr>
<tr>
<td>Sitting pelvic tilt</td>
<td>Progression of pelvic tilt exercise in lying with maintenance of upright posture</td>
<td>Norris 1995</td>
</tr>
<tr>
<td>Trunk rotations</td>
<td>Improve range and freedom of trunk rotation to separate upper trunk from lower trunk for counterbalance in walking and to maintain balance in tasks involving reaching or twisting</td>
<td>McNiven 1986, Schenkman et al 1998</td>
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<tr>
<td><strong>Exercises in standing</strong></td>
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<tr>
<td>Rocking on feet: Forwards and backwards</td>
<td>Forwards and backwards sway to increase balance within cone of stability in one plane, and then reduce rocking movement until standing with weight evenly at best point of balance. For weight transference for sit to stand, walking etc and input to ankle strategy for balance. Also improves postural control and increases confidence for tasks in steady standing</td>
<td>Horak et al 1992, Woollacott &amp; Shumway - Cook 1990, Daleiden 1989</td>
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<tr>
<td>Circling on feet</td>
<td>Combination of above two exercises circling in one direction, and then the next to combine hip and ankle balance strategies plus weight transference in all directions</td>
<td>Horak et al 1992, Woollacott &amp; Shumway-Cook 1990, Daleiden 1990, Manchester et al 1989</td>
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<tr>
<td>Sideways arm stretch</td>
<td>Complex co-ordination of bilateral out of phase arm control in two planes with neck rotation</td>
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<td>Rotation in standing</td>
<td>Progression of rotation exercise in sitting, with maintenance of upright posture</td>
<td>Schenkmann et al 1998, Morris et al 1999</td>
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<td>Rotation with stepping</td>
<td>Progression of the above exercise but inclusion of a step to the side rotation increases need for control of weight transference and smooth stepping skills</td>
<td>Schenkmann et al 1998, Morris et al 1999</td>
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<tr>
<td>Stepping backwards</td>
<td>Repeat of the above exercise but backwards to increase hip and trunk extensor control in preparation for walking</td>
<td>Daleiden 1990, Charlett et al 1998</td>
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<td>Standing bend and stretch with knee flexion</td>
<td>Full body stretch with arms up to the ceiling combined with deep breath in and slow, controlled knee and hip flexion to touch floor on the breath out. Multi-tasking with sequences</td>
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<tr>
<td>Standing bend and stretch with knee flexion Contd./</td>
<td>of movements whilst maintaining body control from extension through flexion and postural adjustments. Useful for balance, flexibility of spine, limb range of movement and sit-stand tasks</td>
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<tr>
<td>Standing bend and stretch with knees straight</td>
<td>Full body stretch with arms up to the ceiling combined with deep breath in, and slow, controlled hip flexion to touch floor on the breath out. Further challenges balance as the reach to the floor demands greater control as there is no knee flexion to counter forward movement.</td>
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<tr>
<td>Looseening twist</td>
<td>End of the programme with free action rotation from side to side, allowing arms to swing freely aiding momentum of twisting action. To relax body in the standing position, but also a challenge to standing balance in the face of maintenance of good posture and speed of movement</td>
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