Physiotherapy in Parkinsons Disease
Principles of Physiotherapy

- Early implementation of exercise programme to prevent deconditioning and other preventable complications.
- Utilisation of a meaningful and practical assessment procedure to allow monitoring and identification of rehabilitation priorities.
- The identification of deterioration and timely, appropriate intervention.
- The opportunity for targeted therapy for restoration or compensation of function.
- The involvement of patients and carers in decision-making and management strategies.

Turnbull, 1992
Supporting evidence – getting better!

- RESCUE project (2004.....) - positive
- Dutch Guidelines (2004 /6) – EB guidance
- AGILE (2005) – consensus opinion
- Concepts: METERS (2000), Kuypers (1964)
Physiotherapy should be available for people with PD. Particular consideration should be given to:

- gait re-education, improvement of balance and flexibility
- enhancement of aerobic capacity
- improvement of movement initiation
- improvement of functional independence, including mobility and activities of daily living
- provision of advice regarding safety in the home environment.

(Grade B)
Current best practice

• Services should offer assessment, monitoring, treatment & management and referral onto other agencies
• Treatment location – in many settings, but best in own (familiar) surroundings
• Joint goal planning
• Awareness of family / carer involvement
• Who is in your team?
Clinical staging categories
(McMahon and Thomas 1998)
## Diagnostic process Quick Reference Card 1: History-taking

<table>
<thead>
<tr>
<th>Patient’s perceived problems</th>
<th>Use any stated problems plus the patient ‘expectations’ box from below to agree realistic goals that will form a primary person-specific outcome measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course of the disease and current status</td>
<td>Onset of complaints; how long since the diagnosis; result of earlier diagnostics; severity and nature of the condition</td>
</tr>
<tr>
<td>Participation problems</td>
<td>Problems with relationships; profession and work; social life including leisure activities</td>
</tr>
<tr>
<td>Impairments in functions and limitations in activities</td>
<td>Transfers: Sit down; rise from floor or chair; get in or out of bed; roll over in bed (sleeping problems); get in or out of a car</td>
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<tr>
<td></td>
<td>Body posture: Ability to actively correct posture; pain due to postural problems; problems with reaching, grasping and moving objects</td>
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<td></td>
<td>Balance: Feeling of impaired balance while standing and during activities; orthostatic hypotension; difficulty with dual tasking (motor activity, cognitive)</td>
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<td></td>
<td>Reaching and grasping: Household activities (small repairs, clean, cook, slice food, hold a glass or cup without spilling); personal care (bath, get dressed/unbuttoned, button up, lace up shoes)</td>
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<tr>
<td></td>
<td>Gait: Use of aids; walk in the house; climb the stairs; walk short distances outside (100m); walk long distances outside (&gt;1km); start; stop, turn; speed; onset of festination; onset of freezing (use the Freezing of Gait Questionnaire); relation to falls and the use of cues</td>
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<td></td>
<td>Influence of tiredness, the time of the day and medication on the performance of activities; influence of tremor on the performance of activities</td>
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<tr>
<td>Physical activity</td>
<td>Frequency and duration per week compared to the Department of Health’s recommendation of at least 30 min/day for five days a week; if unsure, use Phone FITT or General Practice Physical Activity Questionnaire (GPPAQ) depending on your patient</td>
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<tr>
<td>Falls risk</td>
<td>For recording fall incidents and near fall incidents, use the questionnaire ‘History of Falling’ For fear of falling, if patients has had near misses this past year, use the International Falls Efficacy Scale (I - FES)</td>
</tr>
<tr>
<td>Co-morbidity</td>
<td>Pressure sores; osteoporosis and mobility-limiting disorders such as arthritis, rheumatoid arthritis, heart failure and COPD</td>
</tr>
<tr>
<td>Treatment</td>
<td>Current treatment (e.g., medication and outcome) and earlier medical and allied health treatment type and outcome</td>
</tr>
<tr>
<td>Other factors</td>
<td>Mental factors: Ability to concentrate; memory; depression; feeling isolated and lonely; being tearful; anger; concern for the future</td>
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<tr>
<td></td>
<td>Personal factors: Insight into the disease; socio-cultural background; attitude (e.g. with regard to work); coping (e.g. the perception of the limitations and possibilities, the patient’s solutions with regard to the limitations)</td>
</tr>
<tr>
<td></td>
<td>External factors: Attitudes, support and relations (e.g. with partner, primary care physician, employer); accommodation (e.g. interior, kind of home); work (content, circumstances, conditions, and relations)</td>
</tr>
<tr>
<td>Expectations</td>
<td>Expectations of the patient with regard to prognosis; goal and course of the treatment; treatment outcome; need for information, advice and coaching</td>
</tr>
</tbody>
</table>
The BG is a collection of nuclei, mainly situated near the base of the brain, that communicate particularly with the cortex, thalamus and cerebellum. The BG is referred to collectively as the automatic processor ‘cruise control’ of the brain (Kirkwood 2006). To perform normal activities of daily living the BG needs to be functionally normally. This requires it to converse with the thalamus and cerebellum to provide coordinated movement.
BG dysfunction

- Impaired performance of well learned motor skills and movement sequences
- Problems maintaining sufficient movement amplitudes
- Difficulty performing two or more well learned tasks simultaneously
- Difficulty shifting motor and cognitive sets
- Increased time for mental processing
Alterations to gait in Parkinson’s

• Slower
• Reduced step length
• Shuffle in later stages, and festination
• Increased flexion in posture
• Reduced arm swing
• Reduced body movement
• Decreased foot clearance
• Freezing
Festation and Freezing

Freezing is often preceded by festination. This is a sudden increase of the stepping rate together with a minimization of the step length, without coming to a halt. Freezing is best described as the feeling of being glued to the floor and is often accompanied by trembling of the legs.
## Gait disturbances in advanced PD

### Parkinson’s features
- Hypo/bradykinesia
- Rigidity (with abnormal posture)
- Disturbed postural response
- Disturbed automatic motor tasks
- Disturbed autonomic function
- Involuntary movements

### Gait disturbances
- Shorter steps, slower, less arm swing, festination
- Joint motion, flexed posture
- Fear of falling, hesitated gait, festination
- Start hesitation, freezing of gait
- Weakness, light headed unsteadiness
- Dystonia or dyskinesias
Discussion about ‘freezers’

- ‘On’ freezing
  - Shorter duration
  - Rhythmical issue of festination
  - Medication does not help
  - May respond better to auditory (temporal) rhythmic cues

- ‘Off’ freezing
  - Longer duration
  - Slow halting, more to do with hypokinesia
  - Medicine can help
  - Better with visual cues
Strategies to Enhance Movement

The use of cues or triggers and compensatory movement strategies is becoming more widely used in the treatment of Parkinson’s as it provides a non-automatic drive for movement amplitude and timing of sequential movements.
Intrinsic and Extrinsic cues

**INTRINSIC**
Generally used for people in the early/middle stage of the disease when patients can learn how to generate their own cues.

**EXTRINSIC**
These tend to be more useful for those entering the later stages of the condition. They may respond better to external stimuli.
Intrinsic Cues and Triggers

• **Attention:** By providing verbal prompts or removing distractions
• **Emotional Set:** Approach a task when in a positive frame of mind. Emotion can influence physical capability eg. Fear of falling.
• **Mental Rehearsal**
• **Internal Dialogue:** Eg: talking themselves through sit to stand.
• **Visualisation:** eg. Stepping over a threshold.
• **Manual Shift:** recognition that they are off the beaten track
EXTRINSIC CUES

• FACILITATE ATTENTION: bring attention back to the task to focus, reduce distractions, tapping them etc
• VISUAL ENVIRONMENT: alteration in visuo-spatial field. Patterned carpet/clutter may make freezing worse.
• VISUAL CUES: Stripes of coloured tape, frames/sticks with pulsed laser beam.
• AUDITORY: succinct verbal command, metronome or music and rhythm.
• SOMATOSENSORY: eg accentuated heel strike to initiate a forward step.
RESCUE PROJECT

Multi centre study. The goal of the project is to improve mobility for people with PD. It is investigating a rehabilitation programme around the concept of cueing.

Positive results: cueing therapy in the home improves gait and balance. However treatment effects wear off when treatment stops pointing to the need for supplementary therapy with permanent cueing devices and follow-up.
CAUSES OF FALLS

Parkinson symptoms: rigidity, hypokinesia and bradykinesia.

Additional symptoms and co-morbidities especially in the elderly

Fear of falling

Effects of medication

Hazards in and around the home
Aims of Long term Management

• To maintain the patient at the highest level of functional independence for as long as possible
• To monitor the patient objectively at regular intervals
• To prevent or reduce mobility and deformity problems
• To educate and support the patient, relatives, and carers in the management of the condition.
When to refer to Physio?

- As early as possible!!
- Any stage through the course of the disease but be clear as to what your aims are eg: rehabilitation goals, maintenance or palliative.