UK PARKINSON'S Excellence Network

A focus on exercise for people affected by Parkinson's

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17th April 2021

Session aims:

To recap exercise from two perspectives*:

1. Building on research-based knowledge of benefits of exercise for remaining active
2. The relationship of exercise to the three Exercise Framework focus areas

To lead into later discussion about support and resources needed to utilise/ promote exercise over the coming year

*Physiotherapy bias!

Acknowledgements:

- Parkinson's UK members (staff, people affected by Parkinson's, wider stakeholders)
- Exercise Professionals Hub (particularly Beccy Oliver, Julie Jones and Katherine Baker)

The ‘Exercise’ message

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‘Exercise benefits’ is not new news

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SPRING
Special Parkinson's Research Interest Group

Developing the disease-modifying possibilities of exercise on Parkinson's

A conference for researchers

Parkinson's Disease Society

24th and 25th September 2009

Ramada Plaza hotel, Gatwick

Perspective of exercise for Parkinson's[1]

Decade	Trend or revolution
1960s	Levodopa introduced
1970s	Drugs improved; **exercise considered unhelpful**
1980s	**Exercise considered adjunctive**
1990s	Deep brain stimulation
2000s	**Exercise complimentary with medication**
2010+	**Exercise neuroplastic** - possibly neuroprotective and neurorestorative

Exercise over a lifetime

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Fewer people are diagnosed with Parkinson's if they have a lifetime level of physical activity[2-4]

People with Parkinson's are significantly less active compared to those without it, even at diagnosis[5,6]

Prolonged engagement attenuates motor symptoms with reported improvements in non-motor symptoms and quality of life[7-9]

A glut of research[10,11]

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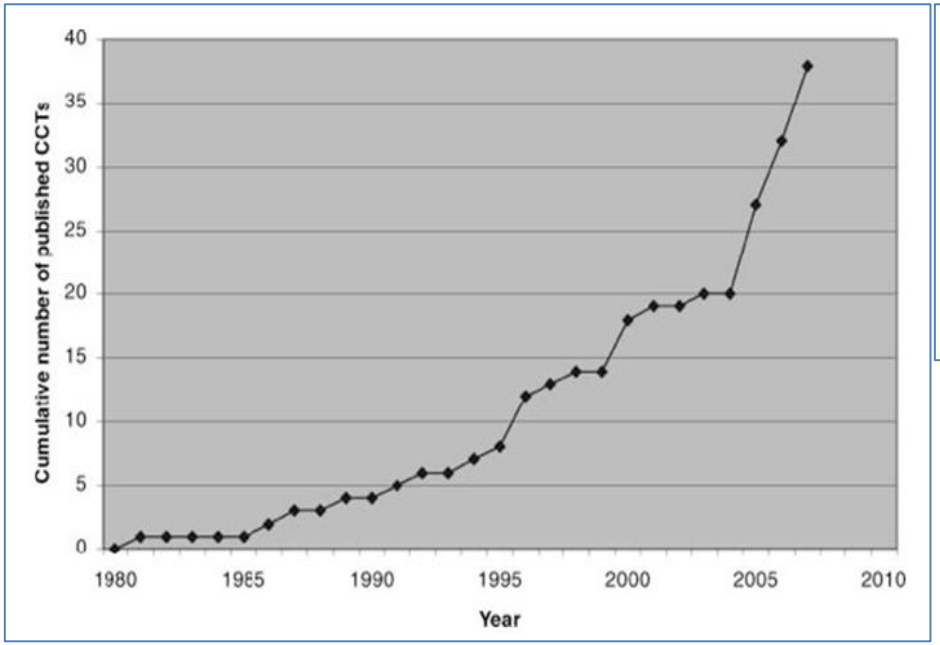


Movement Disorders
Vol. 24, No. 1, 2009, pp. 1–14

Reviews

Physical Therapy in Parkinson's Disease: Evolution and Future Challenges

Samyra H.J. Keus, PT, MSc,[1,2,3] Marten Munneke, PT, PhD,[1] Maarten J. Nijkrake, PT, MSc,[1] Gert Kwakkel, PT, PhD,[4] and Bastiaan R. Bloem, MD, PhD[1]*

- Function
- Gait (inc. Nordic walking)
- Flexibility
- Postural exercises
- Strength / resistance
- Balance (re)training
- Co-ordination*
- Relaxation*

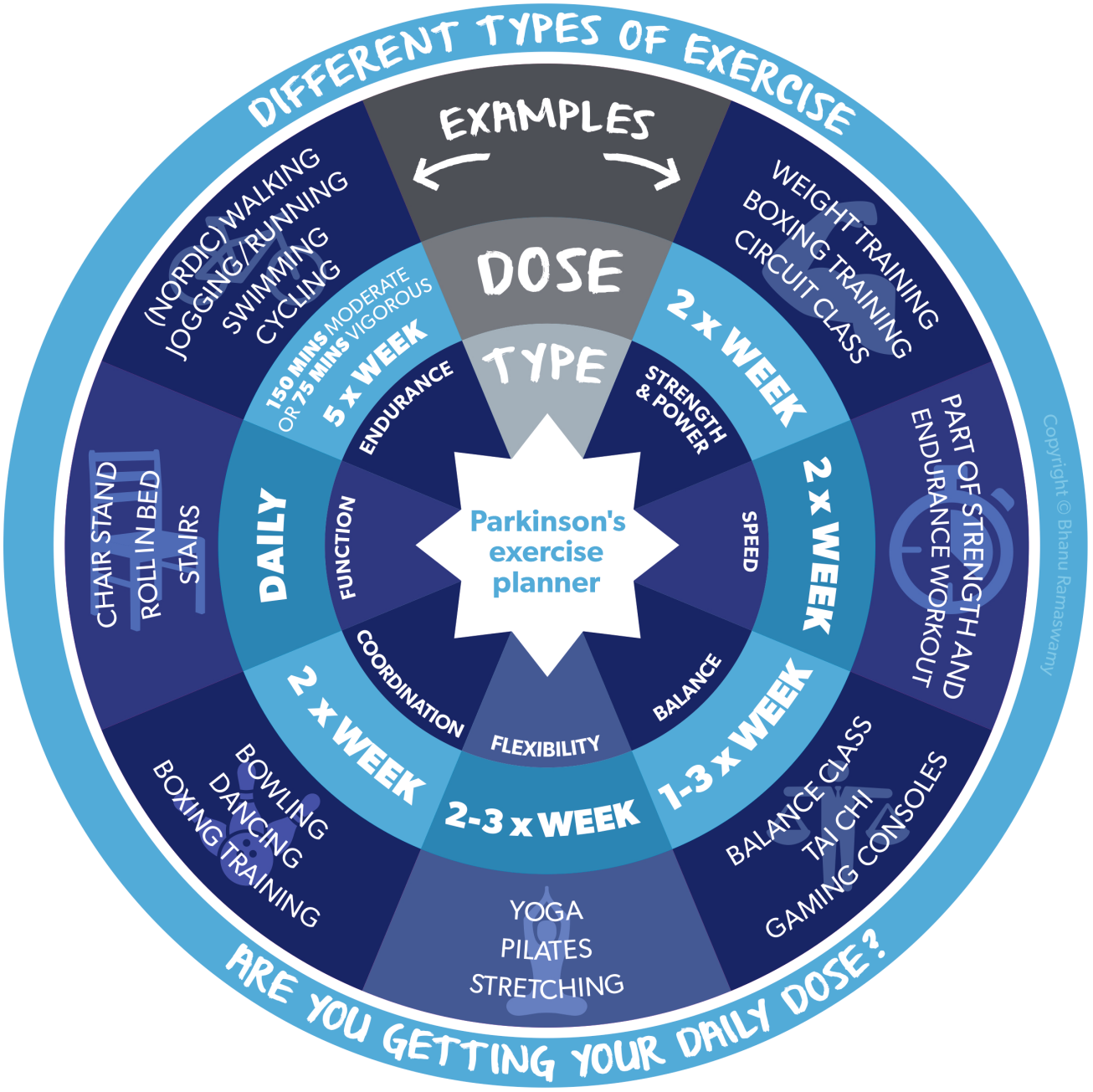
+ also beneficial for health-related QoL

More conventional approaches

*Often part of a programme and not specific treatment or measured

Other exercise styles

- Tai Chi[11-14]
- Dance – Tango esp Argentinian[11,15-16]
- Zumba Gold®[17]
- Irish Set Dancing[18]
- Yoga[19-20]
- Pilates[21-22]
- Exergaming[11]



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From guidelines and research: fitness component approach

Symptomatic approach

- Bradykinesia and rigidity – large amplitude and power movements
- Tremor – stretching or body-weighted activity through hands (short lived)
- Postural instability (reduction in falls risk) – resistance training and balance work with specific falls management strategies
- For some NMS (fatigue, depression, insomnia and constipation) – aerobic and social exercise

Parkinson's UK contacted++

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"I know I need to exercise, but I don't know where to start"

"I want to speak to someone who knows what they are talking about"

PARKINSON'S UK
CHANGE ATTITUDES.
FIND A CURE.
JOIN US.

"The difference for me was seeing a specialist Physiotherapist"

Highlighted a need to develop evidenced informed guidance about exercise

From slides by Julie Jones (2018)

Parkinson's UK's response

- Search through the evidence for the value of exercise for people living with Parkinson's, plus consult people re: their choices of exercise
- There is no 'best', so two-pronged approach:

1. To support health and exercise professionals
2. To support people affected by Parkinson's

as to the advice for people at different ages/ stages of the condition

More than a musculo-skeletal approach

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Published in final edited form as:
Lancet Neurol. 2013 July ; 12(7): 716–726. doi:10.1016/S1474-4422(13)70123-6.

Exercise-enhanced Neuroplasticity Targeting Motor and Cognitive Circuitry in Parkinson's Disease

G. M. Petzinger[1,2], **B. E. Fisher**[2], **S. McEwen**[3], **J. A. Beeler**[4], **J. P. Walsh**[5], and **M. W. Jakowec**[1,2]

BRAIN RESEARCH 1539 (2013) 95–104

Available online at www.sciencedirect.com

ScienceDirect

www.elsevier.com/locate/brainres

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Review

Physical activity and the brain: A review of this dynamic, bi-directional relationship

Paul D. Loprinzi[a,*], *Skyla M. Herod*[b], *Bradley J. Cardinal*[c], *Timothy D. Noakes*[d]

ELSEVIER

Medical Hypotheses

Volume 85, Issue 5, November 2015, Pages 537-541

We need to move more: Neurobiological hypotheses of physical exercise as a treatment for Parkinson's disease

Renato S. Monteiro-Junior [a, b, e, g], Thais Cevada [b, d], Bruno R.R. Oliveira [b, d], Eduardo Lattari [a, d], Eduardo M.M. Portugal [a, b, d], Alessandro Carvalho [c], Andrea C. Deslandes [b, d, f, h, 1]

A Life-Long Approach to Physical Activity for Brain Health

Helen Macpherson[1]*, *Wei-P. Teo*[1], *Luke A. Schneider*[2] *and Ashleigh E. Smith*[3]

ELSEVIER

Parkinsonism & Related Disorders

Volume 22, Supplement 1, January 2016, Pages S78-S81

Exercise-induced neuroplasticity in human Parkinson's disease: What is the evidence telling us?

Mark A. Hirsch, Sanjay S. Iyer, Mohammed Sanjak

Contents lists available at SciVerse ScienceDirect

Parkinsonism and Related Disorders

journal homepage: www.elsevier.com/locate/parkreldis

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Exercise: Is it a neuroprotective and if so, how does it work?

Michael J. Zigmond [a,*], Richard J. Smeyne [b]

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The Parkinson's Exercise Framework for professionals[23]

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	Investing in exercise from diagnosis onwards	Staying active	Managing complex (physical) challenges
Focus	**Emerging evidence suggests that increasing exercise to 2.5 hours a week can slow the progression of Parkinson's symptoms, so:** • seek referral to an informed professional to discuss exercise and its benefits, the individual's physical state and motivation • exposure to an exercise-focused lifestyle (that is sociable and fun), using family, friends or Parkinson's networks, supports regular exercise behaviour • if symptoms are mild, this is the optimal time to improve physical condition to remain well, prevent inactivity and the complications of sedentary behaviour (weight gain, heart disease and metabolic disorders such as diabetes and osteoporosis)	**Keeping moving is important for people with Parkinson's, so:** • stay as (or more) active than at diagnosis and increase exercise targeting Parkinson's-specific issues such as balance and doing two things at once (dual tasking) • continue to keep the progression of symptoms to a minimum by exercising both the body and the mind (especially for memory, attention, and learning) • use the positive effects of exercise to better manage non-motor symptoms such as mood and sleep	**Movement, ability and motivation change over time, so:** • pay attention to specific physical functions that focus on daily activities such as getting up out of a chair, turning or walking safely • continue to maintain general fitness for physical wellbeing, finding ways to make sure this is kept up • prevent discomfort related to postural changes
Exercise style (bearing in mind fitness and any barriers to exercise such as travel or fatigue)	**Target postural control, balance, large movement (including twisting) and coordination through:** • moderate and vigorous intensity exercise to get the best performance from the body. Best done 5 x week in 30 minute bouts (can be built over time) • progressive resistance exercise to build muscle strength and power. Best results if done 2 x week • Parkinson's-specific exercise prescribed by health professionals such as dual-tasking and stretching for flexibility. Best results if done 2 x week • (Evidence from animal models that vigorous intensity exercise may have neuroprotective effects is in its infancy with humans, so more research is needed.)	**Target flexibility (dynamic stretching), plus slower exercise to control postural muscles for balance through:** • maintaining effortful exercise that pushes people according to their fitness levels • continuing resistance exercises • increasing balance exercises • increasing postural exercises • Parkinson's-specific review by health professionals	**Target better movement through:** • functional exercise (chair-based with the use of resistance bands) • supervised classes with a professional reviewing safety to perform exercise • home programmes to stay moving, avoid sedentary behaviour, reduce flexed position and the secondary effects of being less mobile
Examples	• **Sport: racket sport, cycling, jogging, running and swimming** • **Leisure centre and other classes: aerobics, vigorous intensity training (such as boot camps with high level balance work), Nordic walking** • **Home DVDs or high intensity exergaming** • **Parkinson's-specific exercise such as PD Warrior, boxing training classes, the Parkinson's Wellness Recovery (PWR!) programme, some exercise classes run by the Parkinson's UK network**	• **Golf, bowling, (paired) dance, health walks, swimming** • **Flexibility with strength: tai chi, Pilates and yoga** • **Specific classes for people with Parkinson's such as LSVT BIG and balance and walking classes (run by the Parkinson's UK network)**	• **Specific classes for people with mobility and balance challenges, especially dance** • **Pedal exerciser** • **Resistance band workouts** • **Supervised balance and mobility challenge tasks** • **Seated exercise groups (some run by the Parkinson's UK network)**

Framework basis of 'when'

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Investing in exercise from diagnosis

- Return movement quality
- To reduce experience of symptoms by slowing disease progression (improve blood flow across the brain; increased levels of proteins associated with dopaminergic neurone survival e.g. brain- or glial-derived neurotropic factors; improve nerve connections)

Staying Active

- Utilise/ build on exercise to prevent secondary complications of inactivity (non-Parkinson's)
- Falls risk reduction

Managing Complex Challenges

- Maintenance of function
- Tap into benefits of movement (postural preservation, pain management)

Framework focus of 'what'

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Investing in exercise from diagnosis

Target postural control, large movement, rotation, and co-ordination though (build to > 2.5 hours/week):

- Mod-vigorous exercise, 30 mins, 5 x weekly
- Progressive resistance exercise, 2 x a week
- Parkinson's specific exercise 2 x a week

Staying Active

Target flexibility, slower exercise to control postural muscles for balance through:

- Maintaining effortful exercise
- Continuing resistance exercise
- Increasing balance and postural exercise
- Parkinson's specific review by specialist physiotherapist.

Managing Complex Challenges

Target functional exercise for better movement through:

- Supervised exercise classes
- Home exercise programmes
- Maintenance of posture
- Avoiding sedentary behaviour

Current research that impacts on exercise

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Health: Cellular level

Medication: Cellular to functional level trials

Therapies: Physical, mental health and diet

Bhanu's pick …

Parkinson's Outcome Project

National Parkinson's Foundation funded started 2009; 13,000 participants across 4 countries.

Youngest 25 years – oldest 95 years; newly diagnosed to 20 years post diagnosis.

Main message for us: build to 2.5 hours/ week exercise to slow disease and improve life quality.

Ongoing tracking.

More information:

- Project report: https://www.parkinson.org/sites/default/files/Parkinsons%20Outcomes%20Project%20Report%20to%20the%20Community.pdf
- Project site: https://www.parkinson.org/research/Parkinsons-Outcomes-Project
- Exercise sheet: https://www.parkinson.org/sites/default/files/attachments/Exercise-Parkinsons_KK%20Update.pdf

Exercise facilitators[7,8,24,25]

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- Positive personal attitudes (includes tutor)
- Individually tailored gym programmes (understand pathology)
- A setting that actively supports people with similar conditions and disabilities
- An exercise programme that considers individual motivators for exercise i.e. no assuming motivating factors are weight control, body shape or keeping fit.

Alan (90 – 95)

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