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RAPID RESEARCH

March 2022

Inside This Week: Exercise Can Help Parkinson's Disease

-
- ✓ Exercise Guidelines For: MS, Stroke & Parkinson's

 - ✓ Physically Activity Prevention for Parkinson's

 - ✓ Benefits & Mechanisms of Exercise Training for Parkinson's Disease



EXERCISE GUIDELINES FOR: STROKE MULTIPLE SCLEROSIS & PARKINSON'S

[Click for Full Text
\(Kim et al 2019\)](#)

This research synthesized resources reporting aerobic and resistance training guidelines for people with MS, stroke, and PD.



KEY FINDINGS

18 eligible papers; (MS, n=817, Stroke, n=626, PD n=432).

Multiple Sclerosis:

General Aerobic Exercise prescription:

2-3 days/wk, 10-30 min, 11/20 on RPE scale, 40-60% max HR

Advanced Aerobic, exercise prescription.

5 days/wk; 40 mins; 15/20 on RPE scale, 80% max HR.

General Resistance exercise prescription:

2-3 days/wk, 1-3 sets of 8-15 repmax, 5-10 exs, 2-4 min rest/set
Large muscle groups, especially lower extremities are prioritized
1 Day rest between sessions, ok on same day as aerobic exercise

Special considerations:

MS-specific symptoms (i.e. fatigue and heat sensitivity)
Risk of falls (Supervised seated aerobic & strength exercises)

Recommended exercise prescriptions for adults with mild to moderate MS

| | General aerobic exercise | Advanced aerobic exercise | General resistance exercise |
|------------------------|--|--|--|
| How often? | 2–3 days per week | 5 days per week | 2–3 days per week |
| How much? | Gradually increase the duration of exercise from 10–30 minutes over time. | The duration of the exercise bouts can approach 40 minutes. | The exercise bouts should range from 1–3 sets between 8–15 repetitions of each exercise. Try to do 5–10 exercises. |
| How hard? | These activities should be performed at a moderate-intensity. Moderate-intensity of exercise is usually between 11 and 13 on the 20-point RPE scale. Alternative way of measuring moderate-intensity of exercise is 40–60% VO_{2peak} or HR_{peak} | Intensity of exercise can approach a 15 on the 20-point RPE scale. Alternative way of measuring intensity of exercise is 70% VO_{2peak} or 80% HR_{peak} . | Pick a resistance that you can finish 8–15 repetitions of the last set comfortably. |
| How to? | Some options for activity include: <ul style="list-style-type: none"> • Ergometry (arm, leg, or combined) • Walking (over-ground or treadmill) • Aquatics (including swimming) • Elliptical | Some options for activity include: <ul style="list-style-type: none"> • Same as general guidelines • Running • Road cycling | Resistance training activities mainly target major/large muscle groups: <ul style="list-style-type: none"> • Weight machines • Free weights • Elastic bands |
| Special Considerations | <ul style="list-style-type: none"> • Overall progression should start with either duration or frequency, and finally progress intensity per tolerability of the person. • Rest your muscles 2–4 minutes duration in between sets and muscle groups. • Rest your muscles for at least one day between strength training sessions. • Aerobic and resistance training can be performed on the same day as aerobic exercise training, depending on tolerability. • MS-specific symptoms (i.e., fatigue and heat sensitivity) should be identified and discussed before prescribing an exercise routine. | | |

RPE, rating of perceived exertion; VO_{2peak} , peak oxygen consumption; HR_{peak} , peak heart rate

KEY FINDINGS

Stroke

General Aerobic Exercise prescription:

3-5 days/wk, 3 days/wk, 20-40 minutes, 12/20 RPE scale, 40-59% heart rate reserve (HRR).

Advanced Aerobic, exercise prescription.

5-7 days/wk; up to 60 minutes, 16/20 RPE scale, 60 and 80% HRR. T

General Resistance exercise prescription:

2-3 days/wk, 1-3 sets, 10-15 rep max At 30-50% 1RPM

Early stage; Target major muscle groups

Later stages; Intensity increased to 50 to 80% 1-RM as tolerated.

1 day of rest between sessions

ok on the same day as aerobic exercise training

Special considerations:

Promote a safe and continuous exercise regimen.

Thorough screening for CV risk factors

HR monitoring & occasional blood pressure monitoring

Risk of falls (Seated/Body weight supported exercises)

Emphasis on benefit, lifestyle, & volume of aerobic training

Recommended exercise prescriptions for adults with mild to moderate post-stroke

| | General aerobic exercise | Advanced aerobic exercise | General resistance exercise |
|------------------------|---|--|--|
| How often? | 3–5 days per week | 5–7 days per week | 2–3 days per week |
| How much? | Gradually increase the duration of exercise from 20–40 minutes over time. The duration can be obtained through multiple 10-minute bouts across the day. | The duration of the exercise bouts can approach 60 minutes. | The exercise bouts should range from 1–3 sets between 10–15 repetitions of each exercise. Try to do 8–10 exercises. |
| How hard? | These activities should be performed at a moderate-intensity. Moderate-intensity of exercise is usually between 12 and 13 on the 20-point RPE scale. Alternative way of measuring moderate-intensity of exercise is 40–59% HRR. | Intensity of exercise can approach between 14 and 16 on the 20-point RPE scale. Alternative way of measuring intensity of exercise is 60–80% HRR. | Pick a resistance between 30–50% and up to 50–80% of 1-RM. |
| How to? | Some options for activity include: <ul style="list-style-type: none"> • Ergometry (arm, leg, or combined) • Walking (over-ground or treadmill) • Aquatics (including swimming) • Recumbent stepping | Some options for activity include: <ul style="list-style-type: none"> • Same as general guidelines • Elliptical | Resistance training activities mainly target major/large muscle groups: <ul style="list-style-type: none"> • Weight machines • Free weights • Elastic bands |
| Special Considerations | <ul style="list-style-type: none"> • Overall progression should start with either duration or frequency, and finally progress intensity per tolerability of the person. • Rest your muscles 2–4 minutes duration in between sets and muscle groups. • Rest your muscles for at least one day between strength training sessions. • Aerobic and resistance training can be performed on the same day as aerobic exercise training, depending on tolerability. • Cardiovascular risk factors should be screened before prescribing an exercise routine. • Heart rate and blood pressure monitoring should be carried out. | | |

RPE, rating of perceived exertion; HRR, heart rate reserve; 1-RM, one-repetition maximum

KEY FINDINGS

Parkinson's Disease

General Aerobic Exercise prescription:

3-5 days/wk, 20-30-60 mins, 13/20 on RPE scale, 60-80% HR_{peak} or 40-60% HRR/oxygen uptake reserve (VO₂R).

Advanced Aerobic, exercise prescription.

2-3 days/wk, 2 days/wk, 1-3 sets, 8-12 reps at 40-50-60-80% 1-RM
8-10 exs

Targeting major/large muscle groups that are important for everyday function (e.g., walking or climbing steps).

Special considerations:

Implement effective exercise regimen in a safe environment. Undertaken during medication cycles or in an "on" state. Include visual & auditory cues that promote movement coordination.

Supervised exercise training is recommended for safety. Risk of Falls (Seated/Body weight support exercises)

Recommended exercise prescriptions for adults with mild to moderate PD

| | General aerobic exercise | General resistance exercise |
|------------------------|--|--|
| How often? | 3–5 days per week | 2–3 days per week |
| How much? | Gradually increase the duration of exercise from 20 to 60 minutes over time. | The exercise bouts should range from 1 to 3 sets of 8 to 12 repetitions of each exercise. |
| How hard? | These activities should be performed at a moderate-intensity. Moderate-intensity of exercise is usually 13 on the 20-point RPE scale. Alternative way of measuring moderate-intensity of exercise is 60–80% HR _{peak} or 40–60% HRR/VO ₂ R. | Pick a resistance between 40–50% and up to 60–80% of 1-RM. |
| How to? | Some options for activity include: <ul style="list-style-type: none"> • Ergometry (arm, leg, or combined) • Walking (over-ground or treadmill) • Aquatics (including swimming) | Resistance training activities mainly target major/large muscle groups: <ul style="list-style-type: none"> • Weight machines • Free weights • Elastic bands |
| Special Considerations | <ul style="list-style-type: none"> • Overall progression should start with either duration or frequency, and finally progress intensity per tolerability of the person. • Rest your muscles 2–4 minutes duration in between sets and muscle groups. • Rest your muscles for at least one day between strength training sessions. • Aerobic and resistance training can be performed on the same day as aerobic exercise training, depending on tolerability. • The exercise training should be undertaken during medication cycles or in an "on" state. | |

RPE, rating of perceived exertion; HR_{peak}, peak heart rate; HRR, heart rate reserve; VO₂R, oxygen uptake reserve; 1-RM, one-repetition maximum

MAIN TAKEAWAYS

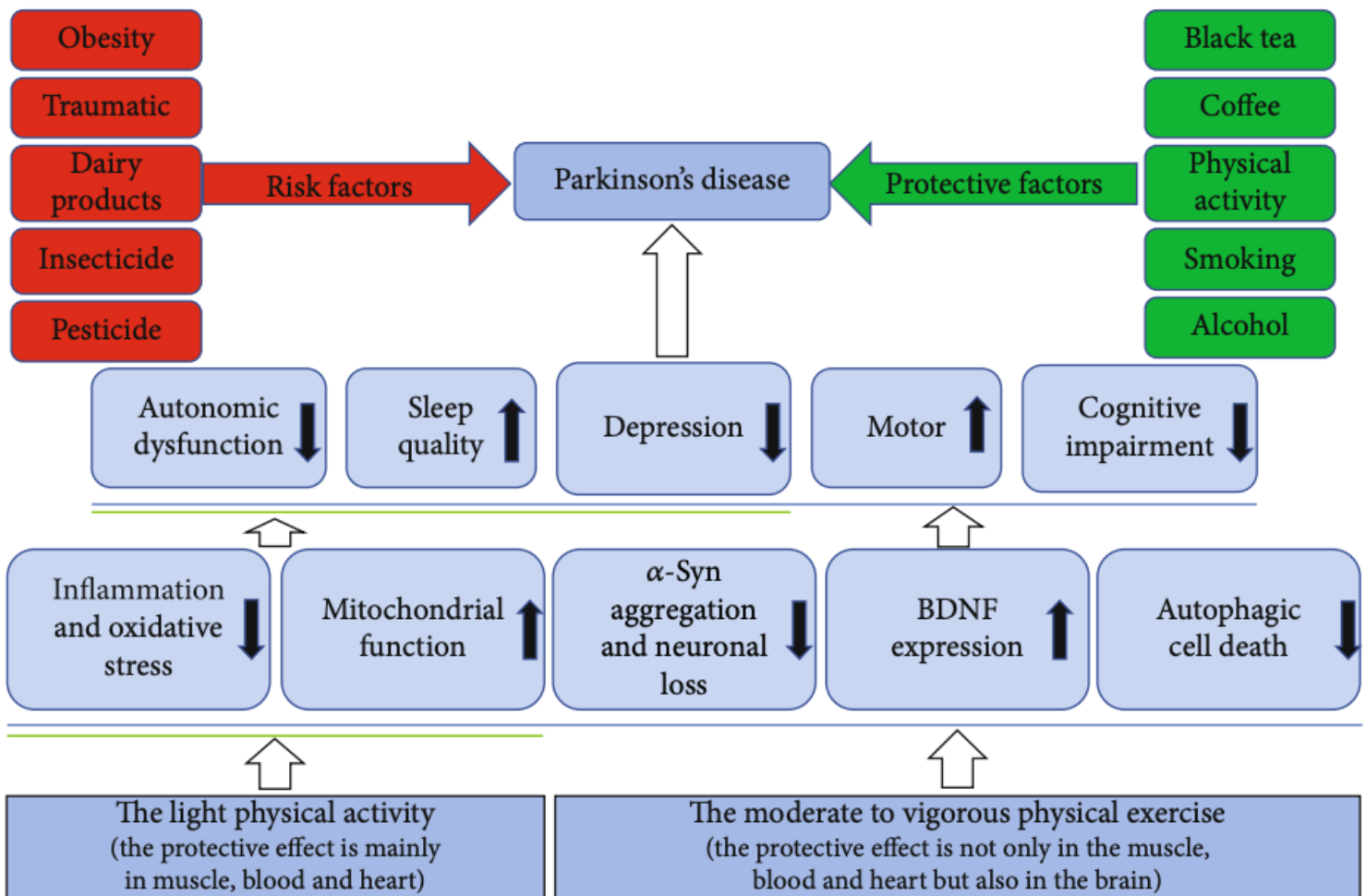
These guidelines provide greater clarity in prescribing specific exercise programs among patients/clients with MS, stroke, and PD.

The consolidation of the existing guidelines is important for possibly addressing the high rate of physical inactivity in MS, stroke, and PD.

PHYSICALLY ACTIVITY PREVENTION FOR PARKINSON'S

[Click for Full Text](#)
([Fan et al. 2020](#))

This study investigated effects and molecular mechanisms of physical activity on Parkinson's disease (PD).



KEY FINDINGS

176 articles included;

Risk Factors of Parkinson's Disease include:

Dairy products

Pesticides

Traumatic brain injury

Obesity.

Protective Factors include:

Alcohol, tobacco, coffee, black tea, and physical activity.

Beneficial Forms of Physical Activity Including:

- Running, Dancing, Traditional Martial arts, Yoga & Weight training.
- Different forms alleviate symptoms of PD through different mechanisms, including reducing the accumulation of α -syn protein, inflammation, and oxidative stress, while enhancing BDNF activity, nerve regeneration, and mitochondrial function.

MAIN TAKEAWAYS

The process of PD is affected by various factors, including risk factors and protective factors.

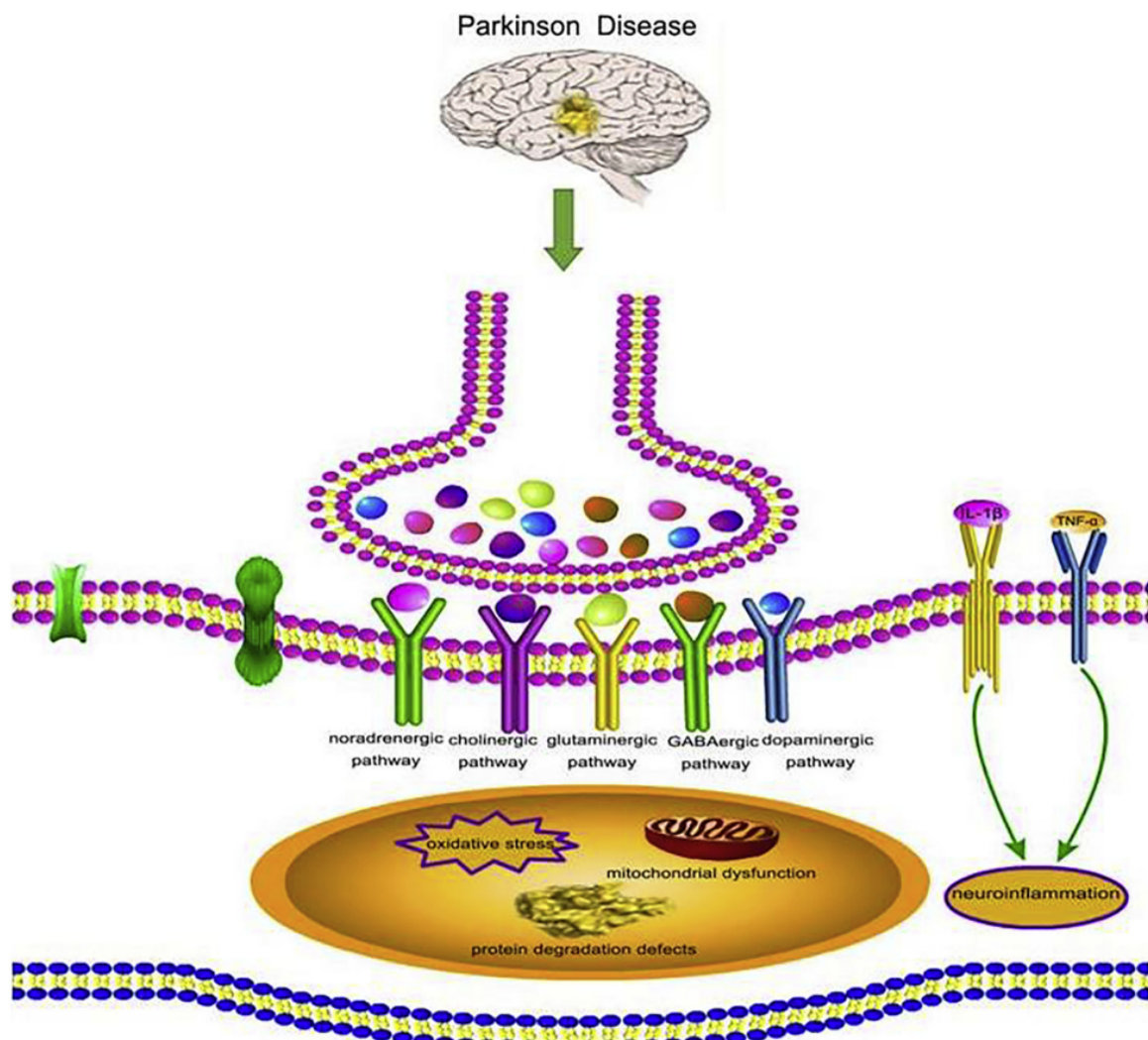
As a safe treatment, physical activity could relieve the symptoms in PD patients, such as motor dysfunction, cognitive deficits, and depression.

Different forms of physical activity, especially the moderate to vigorous physical exercise, have a positive impact on PD through multiple mechanisms.

BENEFITS & MECHANISMS OF EXERCISE TRAINING FOR PARKINSON'S DISEASE

[Click for Full Text
\(Feng et al. 2020\)](#)

This study evaluated if Dynamic MRI provides novel kinematic data that can be used to improve the understanding, diagnosis and best treatment of rotator cuff diseases.



Common Dysfunctions include:

- Postural Instability
- Gait Disorder, incl. Freezing Gait
- Cognitive Impairments

Different Types of Beneficial Exercise Training:

- Aerobic
- Gait, incl. Body Weight Supported & Treadmill Training
- Virtual Reality Training
- Balance
- Resistance Training
- Qi Gong, Thai Chi, & Yoga Practices

MAIN TAKEAWAYS

Various types of exercise therapy can have therapeutic effects on motor disorders and non-motor disorders in patients with PD.

Aerobic exercise is the most widely studied treatment and has positive effects on motor, quality of life, cognition and emotion.

VR technology provides patients with visual, auditory and somatosensory stimulation for dual-tasking training to improve the symptoms of the patients.

Personalized exercise programs need to be provided for patients with dysfunction while considering patient safety.

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