

June 19, 2023



STROKE SPECIAL INTEREST GROUP

Academy of Neurologic Physical Therapy

In this newsletter...

- ***New Article Review *** Effects of Exercise on BDNF Post-stroke
- New Stroke SIG Podcast!
- ANPT Awards 2024 Nominations due Aug. 1
- JNPT Entry-Level Essential Competencies ahead of print!



STROKE SIG
ARTICLE REVIEW
Academy of Neurologic Physical Therapy



Click on the video above to listen to the article review!

Completed by: Daniel Dray, PT, DPT NCS
THANK YOU, DAN!!!

You can either read below, or listen to the audio version with this [LINK](#)

Summary topic title: Effect of Exercise on Brain-Derived Neurotrophic Factor in Stroke Survivors: A Systematic Review and Meta-Analysis

Article reference: Ashcroft SK, Ironside DD, Johnson L, Kuys SS, Thompson-Butel AG. Effect of Exercise on Brain-Derived Neurotrophic Factor in Stroke Survivors: A Systematic Review and Meta-Analysis. *Stroke*. 2022;53(12):3706-3716.

doi:10.1161/STROKEAHA.122.030010

DOI: 10.1161/STROKEAHA.122.039919

Link to full

article: <https://www.ahajournals.org/doi/10.1161/STROKEAHA.122.039919#:~:text=Conclusions%3A,may%20contribute%20to%20increased%20neuroplasticity.>

Definition: Brain-Derived Neurotrophic Factor (BDNF) – an endogenous protein related to nerve growth and a key facilitator of neuroplasticity. BDNF supports neuronal health and encourages growth of synapses and new neurons. Research suggests that the body produces greater concentrations of BDNF following exercise, which could greatly impact stroke recovery and prognosis through increased neuroplasticity.

Purpose of article: It is unclear how *type* and *intensity* of exercise affects BDNF concentration post-stroke. The purpose of this review is to identify the parameters of exercise required to produce increases in BDNF concentration post-stroke.

Methods of interest: A systematic review was performed including studies investigating changes in BDNF concentration following exercise in patients post-stroke. The review included both experimental and observational studies, as well as exercise interventions of any modality. The studies were not limited to a specified time since stroke onset.

Results of interest: Seventeen studies with 687 participants were included in the analysis. Thirty-Seven exercise interventions were included.

Effect of a single session of exercise- A single session of high intensity aerobic exercise significantly increased BDNF concentrations. A single session of low or moderate intensity aerobic exercise had a non-significant effect on BDNF concentrations.

Effect of a program of exercise- A program of high intensity aerobic exercise significantly increased BDNF concentrations. A program of low or moderate intensity aerobic exercise had a non-significant effect on BDNF concentrations. A program of non-aerobic exercise had a non-significant effect on BDNF concentrations.

Discussion, take home message: Exercise intensity appears to be a critical factor in regulating BDNF concentration post-stroke. This review supports aerobic exercise as the preferred method for increasing BDNF concentration, with a program of high-intensity aerobic exercise having the greatest effect. High-intensity aerobic exercise performed close in time to other therapies may optimize motor re-learning and functional improvements poststroke.

Additional references: -ANPT: Locomotor Training CPG Resource Page: This page has an abundance of information/resources for clinicians interesting in implementing high intensity training in their clinic. <https://neuropt.org/practice-resources/anpt-clinical-practice-guidelines/locomotion>
-ACSM Intensity parameters guideline:

Table S2. ACSM aerobic exercise intensity classifications (16)

Aerobic exercise intensity classification	Heart rate maximum	Heart rate reserve	Volume of maximal oxygen uptake	Rating of perceived exertion
Low	57-<64% HRmax	30-<40% HRR	37-<45% VO2max	9-11/20 RPE
Moderate	64-<76% HRmax	40-<60% HRR	45-<64% VO2max	12-13/20 RPE

High 76-<96% HRmax 60-<90% HRR 64-<91%
VO2max 14-17/20 RPE

Abbreviations – ACSM: American College of Sports Medicine; HRmax: Heart rate maximum; HRR: Heart rate reserve; VO2max: Maximal oxygen uptake; RPE: Rating of perceived exertion using the Borg Scale (48)

The effect of exercise on Brain-Derived Neurotrophic Factor (BDNF) in stroke survivors: A systematic review and meta-analysis

687 participants with stroke
17 experimental or observational studies
BDNF measured before and after exercise intervention



Significant ↑ in BDNF concentration with **high intensity aerobic exercise**

- LARGER increase with a program versus single session

High certainty of evidence



Non-significant ↑ in BDNF concentration with **non-aerobic exercise**

- E.g. Conventional physiotherapy, flexibility exercise, etc.

Low certainty of evidence

Conclusions

1. Aerobic exercise *intensity* appears to be a critical factor for BDNF increase
2. Future studies should standardise reporting of participants and interventions for clinical application



STROKE SIG PODCAST

Check out our newest episode - Optimal Intensity and Duration of Walking Rehabilitation in Patients with Chronic Stroke: A Randomized Control Trial

In this episode, host Marissa Moran PT, DPT is joined by Pierce Boyne, PT, DPT, PhD, NCS, Sandra A. Billinger, PT, PhD, and Darcy S. Reisman, PT, PhD to discuss their recent article posted in JAMA Neurology titled “Optimal Intensity and Duration of Walking Rehabilitation in Patients with Chronic Stroke: A Randomized Control Trial.” The authors discuss their research that investigated the gains in walking capacity between two different training parameters (high intensity interval training and moderate intensity aerobic training) after 4, 8, and 12 weeks of training.

Listen on:
Spotify

Apple Podcasts



1. **Service to the Academy**
2. **Early Career Professional**
3. **Excellence in Neurologic Education**
4. **Excellence in Neurologic Research**
5. **PT Clinical Excellence**
6. **PTA Clinical Excellence**
7. **Outstanding Clinical Innovator in Neurologic PT**
8. **Outstanding Advocacy in Neurologic PT**
9. **SIG Service**
10. **SIG Research**

** Nominations may be submitted by individuals and components of the Association.

** Deadline is August 1st.

<https://neuropt.org/about-us/awards/nomination2024>

JNPT Entry-Level Essential Competencies



A detailed description of the methodology and the complete list of final

A detailed description of the methodology and the complete list of initial competencies were published in 2023 in JNPT and can be found [here](#). Check out free resources [here!](#)



VISIT THE STROKE SIG ONLINE!



Academy of Neurologic Physical Therapy
info@neuropt.org | www.neuropt.org

ANPT Social Media



Academy of Neurologic Physical Therapy | 1935 County Road B2 W Ste 165, American Physical Therapy Association, Roseville, MN 55113

[Unsubscribe info@neuropt.org](#)

[Update Profile](#) | [Constant Contact Data Notice](#)

Sent by info@neuropt.org powered by



Try email marketing for free today!