



RESEARCH IN REVIEW

Dear Members,

We are pleased to bring to you this issue of **Research in Review** highlighting research articles relevant to neurologic physical therapy, published over the past months. We hope that you enjoy perusing through the collection of articles we selected for this edition. We appreciate any suggestions or comments you may have to help improve the newsletter.

The Research in Review is a newsletter run by ANPT members, for other ANPT members. We therefore welcome your suggestions of recently published manuscripts for inclusion in the Research in Review. Please submit your suggestion(s) for articles using the link below.

Submit your suggestions of research articles for the next issue of the Research and Review here.

We would like to welcome our new Research in Review Team members Giovanni Berardi, DPT, PhD, Pamela Dunlap, DPT, PhD, Tara McIsaac, PT, PhD, Jackie Palmer, PT, DPT, PhD, and our new Co-Chair, Sujata Pradhan PT, PhD.

Please follow [@APTANeuroPT](#) on Twitter for [#ResearchThursday](#) to learn more about our colleagues' research!

Sincerely,

Research in Review Co-Chairs

Antoinette Domingo, PT, PhD
Associate Professor
Doctor of Physical Therapy Program
School of Exercise and Nutritional Sciences
San Diego State University

and

Sujata Pradhan, PT, PhD
Associate Professor
Division of Physical Therapy
Department of Rehabilitation Medicine
University of Washington

RESEARCH TOPICS

- Feature Article
- Motor Control
- Rehabilitation
- Clinical Neurophysiology
- Technologies



Full text articles in JNPT
are **free** for members

FEATURE ARTICLES

Tactile Sensation Improves Following Motor Rehabilitation for Chronic Stroke: The VIGorous Randomized Controlled Trial.

Borstad A, Nichols-Larsen D, Uswatte G, Strahl N, Simeo M, Proffitt R, Gauthier L. Neurorehabil Neural Repair. 2022 Aug;36(8):525-534. doi: 10.1177/15459683221107893. Epub 2022 Jun 11. PMID: 35695197 Clinical Trial.

Qualitative analysis of perceived motivators and barriers to exercise in individuals with spinal cord injury enrolled in an exercise study.

Tiu C, Ochoa C, Froehlich-Grobe K. Spinal Cord Ser Cases. 2022 Aug 9;8(1):74. doi: 10.1038/s41394-022-00539-1. PMID: 35945196

MOTOR CONTROL

Balance Training Modulates Cortical Inhibition in Individuals with Parkinson's Disease: A Randomized Controlled Trial.

Liu HH, Wang RY, Cheng SJ, Liao KK, Zhou JH, Yang YR. Neurorehabil Neural Repair. 2022 Aug 25;15459683221119761. doi: 10.1177/15459683221119761. Online ahead of print. PMID: 36004820

Regional cerebral blood perfusion changes in chronic stroke survivors as potential brain correlates of the functional outcome following gamified home-based rehabilitation (IntelliRehab)-a pilot study.

Firwana YMS, Zolkefley MKI, Mohamed Hatta HZ, Rowbin C, Che Mohd Nassir CMN, Hanafi MH, Abdullah MS, Keserci B, Lannin NA, Mustapha M. J Neuroeng Rehabil. 2022 Aug 24;19(1):94. doi: 10.1186/s12984-022-01072-w. PMID: 36002827 **Free PMC article.**

Visual oscillation effects on dynamic balance control in people with multiple sclerosis.

Riem L, Beardsley SA, Obeidat AZ, Schmit BD. J Neuroeng Rehabil. 2022 Aug 17;19(1):90. doi: 10.1186/s12984-022-01060-0. PMID: 35978431 **Free PMC article.**

The effects of treadmill training with visual feedback and rhythmic auditory cue on gait and

balance in chronic stroke patients: A randomized controlled trial.

Shin J, Chung Y.

NeuroRehabilitation. 2022 Aug 6. doi: 10.3233/NRE-220099. Online ahead of print.

PMID: 35964207

Association between spatial neglect and impaired verticality perception after stroke: a systematic review.

Embrechts E, van der Waal C, Anseeuw D, van Buijnderen J, Leroij A, Lafosse C, Nijboer T, Truijen S, Saeys W.

Ann Phys Rehabil Med. 2022 Aug 10:101700. doi: 10.1016/j.rehab.2022.101700. Online ahead of print.

PMID: 35963568 Review.

Effects of Cross-Education on Neural Adaptations Following Non-Paretic Limb Training in Stroke: A Scoping Review with Implications for Neurorehabilitation.

Lim H, Madhavan S.

J Mot Behav. 2022 Aug 8:1-14. doi: 10.1080/00222895.2022.2106935. Online ahead of print.

PMID: 35940590 Review.

The effects of stroke on weight transfer before voluntary lateral and forward steps.

Lanza MB, Gray VL.

Front Neurol. 2022 Jul 22;13:891439. doi: 10.3389/fneur.2022.891439. eCollection 2022.

PMID: 35937060 **Free PMC article.**

Historical development and contemporary use of neuromodulation in human spinal cord injury.

Harkema S, Angeli C, Gerasimenko Y.

Curr Opin Neurol. 2022 Aug 1;35(4):536-543. doi: 10.1097/WCO.0000000000001080.

PMID: 35856918 Review.

Corpus Callosal Microstructure Predicts Bimanual Motor Performance in Chronic Stroke Survivors: a Preliminary Cross-Sectional Study.

Varghese R, Chang B, Kim B, Liew SL, Schweighofer N, Winstein CJ.

Top Stroke Rehabil. 2022 Jul 20:1-9. doi: 10.1080/10749357.2022.2095085. Online ahead of print.

PMID: 35856402

Training in Varying Environmental Contexts Facilitates Transfer of Improved Gait Performance to New Contexts for Individuals With Parkinson Disease: A Randomized Controlled Trial.

Lee YY, Tai CH, Fisher BE.

Arch Phys Med Rehabil. 2022 Jul 8:S0003-9993(22)00516-0. doi:

10.1016/j.apmr.2022.06.010. Online ahead of print.

PMID: 35810822

Baseline Predictors of Response to Repetitive Task Practice in Chronic Stroke.

Dimyan MA, Harcum S, Ermer E, Boos AF, Conroy SS, Liu F, Horn LB, Xu H, Zhan M, Chen H, Whittall J, Wittenberg GF.

Neurorehabil Neural Repair. 2022 Jul;36(7):426-436. doi: 10.1177/15459683221095171. Epub 2022 May 26.

PMID: 35616437 **Free PMC article.**

Effects of therapeutic intervention on spatiotemporal gait parameters in adults with neurological disorder: systematic review and meta-analysis.

Bishnoi A, Shankar M, Lee R, Hu Y, Hernandez ME.

Arch Phys Med Rehabil. 2022 Jul 1:S0003-9993(22)00485-3. doi:

10.1016/j.apmr.2022.06.003. Online ahead of print.

PMID: 35787837 Review.

Effects of Resistance Training on Motor- and Non-Motor Symptoms in Patients with Parkinson's Disease: A Systematic Review and Meta-Analysis.

Gollan R, Ernst M, Lieker E, Caro-Valenzuela J, Monsef I, Dresen A, Roheger M, Skoetz N, Kalbe E, Folkerts AK.

REHABILITATION

Increasing the Amount and Intensity of Stepping Training During Inpatient Stroke Rehabilitation Improves Locomotor and Non-Locomotor Outcomes.

Henderson CE, Plawecki A, Lucas E, Lotter JK, Scofield M, Carbone A, Jang JH, Hornby TG.

Neurorehabil Neural Repair. 2022 Aug 25;15459683221119759. doi: 10.1177/15459683221119759. Online ahead of print.

PMID: 36004813

Presence of diabetes mellitus affects vertigo outcome in vestibular migraine.

Du Z, Li P, Bing D.

Am J Otolaryngol. 2022 Aug 3;43(5):103562. doi: 10.1016/j.amjoto.2022.103562. Online ahead of print.

PMID: 35981432

Effects of multiple sclerosis on the audio-vestibular system: a systematic review.

Gür E, Binkhamis G, Kluk K.

BMJ Open. 2022 Aug 17;12(8):e060540. doi: 10.1136/bmjopen-2021-060540.

PMID: 35977771 **Free PMC article.**

Development and Validation of the Modified Motion Sensitivity Test.

Heusel-Gillig L, Santucci V, Hall CD.

Otol Neurotol. 2022 Sep 1;43(8):944-949. doi: 10.1097/MAO.0000000000003641.

PMID: 35970158

Footwear characteristics and foot problems in community dwelling people with stroke: a cross-sectional observational study.

Kunkel D, Mamode L, Burnett M, Pickering R, Bader D, Donovan-Hall M, Cole M, Ashburn A, Bowen C.

Disabil Rehabil. 2022 Aug 14;1-8. doi: 10.1080/09638288.2022.2102679. Online ahead of print.

PMID: 35968548

Effects of constraint-induced movement therapy for the lower extremity among individuals post-stroke: A randomized controlled clinical trial.

Aloraini SM.

NeuroRehabilitation. 2022 Aug 10. doi: 10.3233/NRE-220139. Online ahead of print.

PMID: 35964211

Physical Therapy for at Least 6 Months Improves Motor Symptoms in Parkinson's Patients: A Meta-Analysis.

Ji X, Lu D, Yang Q, Xiao L, Wang J, Wang G.

Comput Math Methods Med. 2022 Jul 31;2022:3393191. doi: 10.1155/2022/3393191. eCollection 2022.

PMID: 35959355 **Free PMC article.**

Treatment effect of exercise training on post-stroke depression in middle-aged and older adults: A meta-analysis.

Li C, Zhao M, Sun T, Guo J, Wu M, Li Y, Luo H, Wang X, Li J.

Int J Geriatr Psychiatry. 2022 Sep;37(9). doi: 10.1002/gps.5798.

PMID: 35957537

Stigma, Discrimination and Disclosure of the Diagnosis of Multiple Sclerosis in the Workplace: A Systematic Review.

Vitturi BK, Rahmani A, Dini G, Montecucco A, Debarbieri N, Bandiera P, Ponzio M, Battaglia MA, Persechino B, Inglese M, Durando P.

Int J Environ Res Public Health. 2022 Aug 2;19(15):9452. doi: 10.3390/ijerph19159452.

PMID: 35954811 **Free PMC article.** Review.

Association Between Early-Onset Osteoporosis With Hearing Loss and Benign Paroxysmal Positional Vertigo (BPPV): A Systematic Review and Meta-Analysis.

García A, Rivera S, Alvear-Veas B, Goss D, Castillo-Bustamante M, Garcia JM. Ann Otol Rhinol Laryngol. 2022 Aug 11:34894221118424. doi: 10.1177/00034894221118424. Online ahead of print. PMID: 35950312

Hand-rim biomechanics during geared manual wheelchair propulsion over different ground conditions in individuals with spinal cord injury.

Jahanian O, Gaglio A, Cho CC, Muqeet V, Smith R, Morrow MMB, Hsiao-Wecksler ET, Slavens BA. J Biomech. 2022 Sep;142:111235. doi: 10.1016/j.jbiomech.2022.111235. Epub 2022 Jul 26. PMID: 35947887

The effects of walking training with poles on walking ability: A systematic review and meta-analysis of randomized controlled trials.

Ono K, Nishimoto J, Imura T, Mitsutake T, Inoue Y, Tanaka S, Tanaka R. PM R. 2022 Aug 9. doi: 10.1002/pmrj.12886. Online ahead of print. PMID: 35943832 Review.

Chronic Pain in Young People With Cerebral Palsy: Activity Limitations and Coping Strategies.

Carozza L, Anderson-Mackay E, Blackmore AM, Kirkman HA, Ou J, Smith N, Love S. Pediatr Phys Ther. 2022 Aug 2. doi: 10.1097/PEP.0000000000000943. Online ahead of print. PMID: 35943391

Evidence for cognitive impairment in patients with vestibular disorders.

Chari DA, Madhani A, Sharon JD, Lewis RF. J Neurol. 2022 Aug 5. doi: 10.1007/s00415-022-11289-3. Online ahead of print. PMID: 35930032 Review.

Barriers to Enrollment in Post-Stroke Brain Stimulation in a Racially and Ethnically Diverse Population.

Hodics T, Cohen LG, Pezzullo JC, Kowalske K, Dromerick AW. Neurorehabil Neural Repair. 2022 Aug 4:15459683221088861. doi: 10.1177/15459683221088861. Online ahead of print. PMID: 35925037

Optimising rehabilitation and recovery after a stroke.

Bonifacio GB, Ward NS, Emsley HCA, Cooper J, Bernhardt J. Pract Neurol. 2022 Jul 27:pn-2021-003004. doi: 10.1136/practneurol-2021-003004. Online ahead of print. PMID: 35896376

Effectiveness of Therapies Based on Mirror Neuron System to Treat Gait in Patients with Parkinson's Disease-A Systematic Review.

Lahuerta-Martín S, Llamas-Ramos R, Llamas-Ramos I. J Clin Med. 2022 Jul 21;11(14):4236. doi: 10.3390/jcm11144236. PMID: 35888000 **Free PMC article.** Review.

Daily steps are associated with walking ability in hospitalized patients with sub-acute stroke.

Kubo H, Kanai M, Nozoe M, Inamoto A, Taguchi A, Mase K, Shimada S. Sci Rep. 2022 Jul 17;12(1):12217. doi: 10.1038/s41598-022-16416-8. PMID: 35843983 **Free PMC article.**

Association between physical activity levels and depressive symptoms in patients with minor ischemic stroke.

Ashizawa R, Honda H, Yoshizawa K, Kameyama Y, Yoshimoto Y. J Stroke Cerebrovasc Dis. 2022 Sep;31(9):106641. doi: 10.1016/j.jstrokecerebrovasdis.2022.106641. Epub 2022 Jul 11.

PMID: 35834937

Active or passive pain coping: Which predicts daily physical and psychosocial functioning in people with chronic pain and spinal cord injury?

Kuzu D, Kim S, Kratz AL.

Rehabil Psychol. 2022 Aug;67(3):304-314. doi: 10.1037/rep0000457. Epub 2022 Jul 14.

PMID: 35834204

Patients' Experiences with Management of Benign Paroxysmal Positional Vertigo: Insights from the Vestibular Disorders Association Registry.

Grove CR, Souza WH, Gerend PL, Ryan CA, Schubert MC.

Patient Relat Outcome Meas. 2022 Jul 6;13:157-168. doi: 10.2147/PROM.S370287.

eCollection 2022.

PMID: 35821793 **Free PMC article.**

Aerobic capacity in persons with Parkinson's disease: a systematic review.

Thruø C, Hvid LG, Gamborg M, Dawes H, Dalgas U, Langeskov-Christensen M.

Disabil Rehabil. 2022 Jul 10;1-13. doi: 10.1080/09638288.2022.2094480. Online ahead of print.

PMID: 35815568

Effects of Cycling Dual-Task on Cognitive and Physical Function in Parkinson's Disease: A Randomized Double-Blind Pilot Study.

Pereira-Pedro KP, de Oliveira IM, Mollinedo-Cardalda I, Cancela-Carral JM.

Int J Environ Res Public Health. 2022 Jun 26;19(13):7847. doi: 10.3390/ijerph19137847.

PMID: 35805505 **Free PMC article.** Clinical Trial.

Outcome of vestibular rehabilitation in vestibular migraine.

Balci B, Akdal G.

J Neurol. 2022 Jul 8. doi: 10.1007/s00415-022-11250-4. Online ahead of print.

PMID: 35802200

Capsaicin 8% Patch for Spinal Cord Injury Focal Neuropathic Pain, a Randomized Controlled Trial.

Olusanya A, Yearsley A, Brown N, Braun S, Hayes C, Rose E, Connolly B, Dicks M, Beal C, Helmonds B, Peace W, Kirkman B, Nguyen C, Erickson J, Nguyen G, Lukose E, Koek W, Nagpal SA, Trbovich M.

Pain Med. 2022 Jul 7;pnac104. doi: 10.1093/pm/pnac104. Online ahead of print.

PMID: 35799365

Effectiveness of Motor Imagery Combined with Structured Progressive Circuit Class Training on Functional Mobility in Post-Stroke Individuals: A Randomized Controlled Trial.

Aung N, Hiengkaew V, Tretriluxana J, Bryant MS, Bovonsunthonchai S.

J Rehabil Med. 2022 Jul 27;54:jrm00297. doi: 10.2340/jrm.v54.1390.

PMID: 35797065 **Free PMC article.** Clinical Trial.

Impact of Parkinson's Disease on Functional Mobility at Different Stages.

Mollà-Casanova S, Pedrero-Sánchez J, Inglés M, López-Pascual J, Muñoz-Gómez E,

Aguilar-Rodríguez M, Sempere-Rubio N, Serra-Añó P.

Front Aging Neurosci. 2022 Jun 15;14:935841. doi: 10.3389/fnagi.2022.935841.

eCollection 2022.

PMID: 35783141 **Free PMC article.**

Dual task effect on upper and lower extremity skills in different stages of Parkinson's disease.

Ozcan Gulsen E, Tunca Yilmaz O.

Acta Neurol Belg. 2022 Jul 1. doi: 10.1007/s13760-022-02007-x. Online ahead of print.

PMID: 35776407

Fear of Falling Avoidance Behavior in Parkinson's Disease: Most Frequently Avoided Activities.

Rider JV, Longhurst JK, Navalta JW, Young DL, Landers MR.

OTJR (Thorofare N J). 2022 Jun 30;15394492221106103. doi:

10.1177/15394492221106103. Online ahead of print.

PMID: 35773954

Evaluating occupational performance coaching to support fatigue management for people with multiple sclerosis: A feasibility study.

Askari S, Kessler D, Smyth P, Finlayson M.

Clin Rehabil. 2022 Sep;36(9):1244-1256. doi: 10.1177/02692155221107074. Epub 2022 Jun 7.

PMID: 35673263 **Free PMC article.** Clinical Trial.

A systematic review on the effectiveness of perturbation-based balance training in postural control and gait in Parkinson's disease.

Coelho DB, de Oliveira CEN, Guimarães MVC, Ribeiro de Souza C, Dos Santos ML, de Lima-Pardini AC.

Physiotherapy. 2022 Sep;116:58-71. doi: 10.1016/j.physio.2022.02.005. Epub 2022 Feb 25.

PMID: 35550488 Review.

The impact of the COVID-19 pandemic on physical therapy practice for people with multiple sclerosis: A multicenter survey study of the RIMS network.

Kahraman T, Rasova K, Jonsdottir J, Medina CS, Kos D, Coote S, Tacchino A, Smedal T, Arntzen EC, Quinn G, Learmonth Y, Pedulla L, Moumdjian L, Kalron A.

Mult Scler Relat Disord. 2022 Jun;62:103799. doi: 10.1016/j.msard.2022.103799. Epub 2022 Apr 10.

PMID: 35428030 **Free PMC article.**

The SIT-PT Trial Protocol: A Dose-Matched Randomized Clinical Trial Comparing 2 Physical Therapist Interventions for Infants and Toddlers With Cerebral Palsy.

Dusing SC, Harbourne RT, Hsu LY, Koziol NA, Kretch K, Sargent B, Jensen-Willett S, McCoy SW, Vanderbilt DL.

Phys Ther. 2022 Jul 4;102(7):pzac039. doi: 10.1093/ptj/pzac039.

PMID: 35421222

Association between sleep disturbances and pain subtypes in Parkinson's disease.

Gao L, Huang W, Cai L, Li H.

Neurol Sci. 2022 Aug;43(8):4785-4790. doi: 10.1007/s10072-022-06030-x. Epub 2022 Mar 26.

PMID: 35347526

Investigating the potential disease-modifying and neuroprotective efficacy of exercise therapy early in the disease course of multiple sclerosis: The Early Multiple Sclerosis Exercise Study (EMSES).

Riemenschneider M, Hvid LG, Ringgaard S, Nygaard MKE, Eskildsen SF, Gaemelke T, Magyari M, Jensen HB, Nielsen HH, Kant M, Falah M, Petersen T, Stenager E, Dalgas U.

Mult Scler. 2022 Sep;28(10):1620-1629. doi: 10.1177/13524585221079200. Epub 2022 Mar 16.

PMID: 35296183 Clinical Trial.

Pain Trajectories During Initial Rehabilitation After Spinal Cord Injury: Do Psychosocial Resources and Mental Health Predict Trajectories?

Braunwalder C, Ehrmann C, Hodel J, Müller R, von Matt D, Fekete C.

Arch Phys Med Rehabil. 2022 Jul;103(7):1294-1302. doi: 10.1016/j.apmr.2022.01.149. Epub 2022 Feb 11.

PMID: 35157891

The effect of time spent in rehabilitation on activity limitation and impairment after stroke.

Clark B, Whittall J, Kwakkel G, Mehrholz J, Ewings S, BurrIDGE J.

Cochrane Database Syst Rev. 2021 Oct 25;10(10):CD012612. doi: 10.1002/14651858.CD012612.pub2.

PMID: 34695300 Review.

A Survey of People With Parkinson's and Their Carers: The Management of Pain in Parkinson's.

Naisby J, Amjad A, Ratcliffe N, Yarnall AJ, Rochester L, Walker R, Baker K.

J Geriatr Psychiatry Neurol. 2022 Jul;35(4):613-621. doi: 10.1177/08919887211023592.

CLINICAL NEUROPHYSIOLOGY

Total tenderness score and pressure pain thresholds in persistent post-traumatic headache attributed to mild traumatic brain injury.

Ashina H, Al-Khazali HM, Iljazi A, Ashina S, Amin FM, Schytz HW.
J Headache Pain. 2022 Aug 8;23(1):96. doi: 10.1186/s10194-022-01457-1.
PMID: 35941545 **Free PMC article.**

Rewiring cortico-muscular control in the healthy and post-stroke human brain with proprioceptive beta-band neurofeedback.

Khademi F, Naros G, Nicksirat A, Kraus D, Gharabaghi A.
J Neurosci. 2022 Aug 8;JN-RM-1530-20. doi: 10.1523/JNEUROSCI.1530-20.2022. Online ahead of print.
PMID: 35940874

Neuroplasticity after upper-extremity rehabilitation therapy with sensory stimulation in chronic stroke survivors.

Schranz C, Vatinno A, Ramakrishnan V, Seo NJ.
Brain Commun. 2022 Jul 24;4(4):fcac191. doi: 10.1093/braincomms/fcac191. eCollection 2022.
PMID: 35938072 **Free PMC article.**

Non-invasive brain stimulation for improving gait, balance, and lower limbs motor function in stroke.

Veldema J, Gharabaghi A.
J Neuroeng Rehabil. 2022 Aug 3;19(1):84. doi: 10.1186/s12984-022-01062-y.
PMID: 35922846 **Free PMC article.** Review.

Repetitive Transcranial Magnetic Stimulation of the Brain After Ischemic Stroke: Mechanisms from Animal Models.

Xing Y, Zhang Y, Li C, Luo L, Hua Y, Hu J, Bai Y.
Cell Mol Neurobiol. 2022 Aug 2. doi: 10.1007/s10571-022-01264-x. Online ahead of print.
PMID: 35917043 Review.

Improving self-motion perception and balance through roll tilt perceptual training.

Wagner AR, Kobel MJ, Tajino J, Merfeld DM.
J Neurophysiol. 2022 Sep 1;128(3):619-633. doi: 10.1152/jn.00092.2022. Epub 2022 Jul 27.
PMID: 35894439

Rehabilitation Interventions Combined with Noninvasive Brain Stimulation on Upper Limb Motor Function in Stroke Patients.

Cha TH, Hwang HS.
Brain Sci. 2022 Jul 27;12(8):994. doi: 10.3390/brainsci12080994.
PMID: 35892435 **Free PMC article.** Review.

New Frontiers in Neurodegeneration and Regeneration Associated with Brain-Derived Neurotrophic Factor and the rs6265 Single Nucleotide Polymorphism.

Szarowicz CA, Steece-Collier K, Caulfield ME.
Int J Mol Sci. 2022 Jul 20;23(14):8011. doi: 10.3390/ijms23148011.
PMID: 35887357 **Free PMC article.** Review.

Effects of Non-Invasive Brain Stimulation on Post-Stroke Spasticity: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.

Wang X, Ge L, Hu H, Yan L, Li L.
Brain Sci. 2022 Jun 27;12(7):836. doi: 10.3390/brainsci12070836.
PMID: 35884643 **Free PMC article.** Review.

COVID-19 and Parkinsonism: A Critical Appraisal.

Cavallieri F, Fioravanti V, Bove F, Del Prete E, Meoni S, Grisanti S, Zedde M, Pascarella R, Moro E, Valzania F.
Biomolecules. 2022 Jul 11;12(7):970. doi: 10.3390/biom12070970.
PMID: 35883526 **Free PMC article.** Review.

BCI-FES With Multimodal Feedback for Motor Recovery Poststroke.

Remsik AB, van Kan PLE, Gloe S, Gjini K, Williams L Jr, Nair V, Caldera K, Williams JC, Prabhakaran V.
Front Hum Neurosci. 2022 Jul 6;16:725715. doi: 10.3389/fnhum.2022.725715. eCollection 2022.
PMID: 35874158 **Free PMC article.**

The Cerebellum is Involved in Motor Improvements After Repetitive Transcranial Magnetic Stimulation in Parkinson's Disease Patients.

Wen X, Chi S, Yu Y, Wang G, Zhang X, Wang Z, Gesang M, Luo B.
Neuroscience. 2022 Sep 1;499:1-11. doi: 10.1016/j.neuroscience.2022.07.004. Epub 2022 Jul 8.
PMID: 35817220

Transcranial Direct Current Stimulation Over Motor Areas Improves Reaction Time in Parkinson's Disease.

Sadler CM, Kami AT, Nantel J, Lommen J, Carlsen AN.
Front Neurol. 2022 Jun 14;13:913517. doi: 10.3389/fneur.2022.913517. eCollection 2022.
PMID: 35775046 **Free PMC article.**

Transcranial magnetic stimulation of the brain: What is stimulated? - A consensus and critical position paper.

Siebner HR, Funke K, Abera AS, Antal A, Bestmann S, Chen R, Classen J, Davare M, Di Lazzaro V, Fox PT, Hallett M, Karabanov AN, Kesselheim J, Beck MM, Koch G, Liebetanz D, Meunier S, Miniussi C, Paulus W, Peterchev AV, Popa T, Ridding MC, Thielscher A, Ziemann U, Rothwell JC, Ugawa Y.
Clin Neurophysiol. 2022 Aug;140:59-97. doi: 10.1016/j.clinph.2022.04.022. Epub 2022 May 18.
PMID: 35738037 Review.

Targeting gut-brain axis through scalp-abdominal electroacupuncture in Parkinson's disease.

Nazarova L, Liu H, Xie H, Wang L, Ding H, An H, Huang D.
Brain Res. 2022 Sep 1;1790:147956. doi: 10.1016/j.brainres.2022.147956. Epub 2022 Jun 1.
PMID: 35660372 Clinical Trial.

Time-dependent cortical plasticity during moderate-intensity continuous training versus high-intensity interval training in rats.

Hugues N, Pin-Barre C, Pellegrino C, Rivera C, Berton E, Laurin J.
Cereb Cortex. 2022 Aug 22;32(17):3829-3847. doi: 10.1093/cercor/bhab451.
PMID: 35029628

TECHNOLOGIES

Examining the effectiveness of virtual, augmented, and mixed reality (VAMR) therapy for upper limb recovery and activities of daily living in stroke patients: a systematic review and meta-analysis.

Leong SC, Tang YM, Toh FM, Fong KNK.
J Neuroeng Rehabil. 2022 Aug 24;19(1):93. doi: 10.1186/s12984-022-01071-x.
PMID: 36002898 **Free PMC article.** Review.

The Impact of Cognitive Impairment on Robot-Based Upper-Limb Motor Assessment in Chronic Stroke.

Bui KD, Lyn B, Roland M, Wamsley CA, Mendonca R, Johnson MJ.
Neurorehabil Neural Repair. 2022 Aug 23;15459683221110892. doi: 10.1177/15459683221110892. Online ahead of print.
PMID: 35999810

Upper limb soft robotic wearable devices: a systematic review.
Bardi E, Gandolla M, Braghin F, Resta F, Pedrocchi ALG, Ambrosini E.
J Neuroeng Rehabil. 2022 Aug 10;19(1):87. doi: 10.1186/s12984-022-01065-9.
PMID: 35948915 **Free PMC article.** Review.

Monitoring Arm Movements Post-Stroke for Applications in Rehabilitation and Home Settings.

Gomez-Arrunategui JP, Eng JJ, Hodgson AJ.
IEEE Trans Neural Syst Rehabil Eng. 2022;30:2312-2321. doi:
10.1109/TNSRE.2022.3197993. Epub 2022 Aug 22.
PMID: 35947559

Systematic review of the application of virtual reality to improve balance, gait and motor function in patients with Parkinson's disease.

Kashif M, Ahmad A, Bandpei MAM, Farooq M, Iram H, E Fatima R.
Medicine (Baltimore). 2022 Aug 5;101(31):e29212. doi: 10.1097/MD.00000000000029212.
PMID: 35945738 **Free PMC article.**

Toward Soft Wearable Strain Sensors for Muscle Activity Monitoring.

Alvarez JT, Gerez LF, Araromi OA, Hunter JG, Choe DK, Payne CJ, Wood RJ, Walsh CJ.
IEEE Trans Neural Syst Rehabil Eng. 2022;30:2198-2206. doi:
10.1109/TNSRE.2022.3196501. Epub 2022 Aug 11.
PMID: 35925858 **Free PMC article.**

A Comprehensive Literature Search of Digital Health Technology Use in Neurological Conditions: Review of Digital Tools to Promote Self-management and Support.

Spreadbury JH, Young A, Kipps CM.
J Med Internet Res. 2022 Jul 28;24(7):e31929. doi: 10.2196/31929.
PMID: 35900822 **Free PMC article.** Review.

Short and long-term effects of robot-assisted therapy on upper limb motor function and activity of daily living in patients post-stroke: a meta-analysis of randomized controlled trials.

Zhang L, Jia G, Ma J, Wang S, Cheng L.
J Neuroeng Rehabil. 2022 Jul 21;19(1):76. doi: 10.1186/s12984-022-01058-8.
PMID: 35864524 **Free PMC article.** Review.

Gait biofeedback training in people with Parkinson's disease: a pilot study.

McMaster K, Cole MH, Chalkley D, Creaby MW.
J Neuroeng Rehabil. 2022 Jul 16;19(1):72. doi: 10.1186/s12984-022-01051-1.
PMID: 35842699 **Free PMC article.**

Active Virtual Reality for Chronic Primary Pain: Mixed Methods Randomized Pilot Study.

Tuck N, Pollard C, Good C, Williams C, Lewis G, Hames M, Aamir T, Bean D.
JMIR Form Res. 2022 Jul 13;6(7):e38366. doi: 10.2196/38366.
PMID: 35830224 **Free PMC article.**

Effects of a social participation-focused virtual reality intervention for community-dwelling stroke survivors with physical disabilities: a randomised controlled trial protocol.

Chau JPC, Lo SHS, Lau AYL, Lee VWY, Choi KC, Kwok ECF, Thompson DR.
BMJ Open. 2022 Jul 5;12(7):e061069. doi: 10.1136/bmjopen-2022-061069.
PMID: 35790329 **Free PMC article.**

A Dynamic Wheelchair Armrest for Promoting Arm Exercise and Mobility After Stroke.

Comellas M, Chan V, Zondervan DK, Reinkensmeyer DJ.
IEEE Trans Neural Syst Rehabil Eng. 2022;30:1829-1839. doi:
10.1109/TNSRE.2022.3187755. Epub 2022 Jul 14.
PMID: 35776829 **Free PMC article.**

Soft robotics and functional electrical stimulation advances for restoring hand function in people with SCI: a narrative review, clinical guidelines and future directions.

Cardoso LRL, Bochkezanian V, Forner-Cordero A, Melendez-Calderon A, Bo APL.
J Neuroeng Rehabil. 2022 Jun 30;19(1):66. doi: 10.1186/s12984-022-01043-1.
PMID: 35773733 **Free PMC article.** Review.



Giovanni Berardi, DPT, PhD
University of Iowa



Antoinette Domingo, PT, PhD (Co-Chair)
San Diego State University



Pamela Dunlap, DPT, PhD
University of Pittsburgh



Tara McIsaac, PT, PhD
Creighton University



Jacqueline Palmer, PT, DPT, PhD
University of Kansas Medical Center



Evan Papa, DPT, PhD
Tufts University



Sujata Pradhan, PT, PhD (Co-Chair)
University of Washington

The Research in Review was designed using Medline filters to extract high impact research articles related to the field of neuroscience and physical therapy, which includes areas of motor control, rehabilitation, clinical neurophysiology, and technology. Emphasis is placed heavily on articles published within the last eight weeks, that cover issues related to spinal cord injury, stroke, balance and falls, brain injury, degenerative diseases, and vestibular rehabilitation. The list contains the full citation and a link to the abstract or full text article. The Research in Review is published once every 2 months and will arrive in your email box in a format that is easily viewable by both HTML and text-based readers. Articles with no volume, issue or page numbers indicate that the article has not been published in paper form yet, but may be available in electronic form through the publisher. We welcome requests for article postings at the first and third Mondays of each month. Those interested in assisting with this endeavor are welcome to contact [Dr. Antoinette Domingo](#).

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

Stay Connected on 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](mailto:info@neuropt.org)

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

Sent by adomingo@sdsu.edu powered by



Try email marketing for free today!