Preparing for the Neurologic Certified Specialist Exam
Resource List
2022 Update

The Neurologic Certified Specialist (NCS) Exam is a certification process for physical therapists that are committed to providing the best evidenced-based care to neurologically-impaired adults. Preparation for the NCS exam requires a commitment of time, energy and focus to the entire process in order to be successful. This outline is designed to help you only in your preparation for the specialist exam. It does not attempt to provide an exhaustive list of resources nor a foolproof way of studying. Neither the American Board of Physical Therapy Specialties, nor the Neurologic Specialty Council has reviewed or endorsed the content of this list. In addition, reviewing these resources does not guarantee that a candidate will receive a passing score on the specialist certification examination.

This list was prepared by the NCS Committee as a service to therapists taking the NCS exam and reflects not only its work but also feedback of those who have taken the exam previously. Its content covers key areas outlined in the Description of Specialty Practice – Neurologic Physical Therapy. According to ABPTS, "specialization is the process by which a physical therapist builds on a broad base of professional education and practice to develop a greater depth of knowledge and skills related to a particular area of practice." Neurologic Certified Specialists treat in a wide variety of settings (e.g. acute hospital, rehabilitation units, home care, private practice, skilled nursing facilities, assisted living units) and to a diverse clientele. Preparation for the exam must take into account the management of patients over a large age and with complex acute and chronic medical histories. To begin your application process:

1. Review all application materials from American Board of Physical Therapy Specialties (ABPTS) at https://specialization.apta.org/become-a-specialist/neurology

2. Review requirements thoroughly and ensure that you have enough clinical hours in the specialty to sit for the exam or that you have satisfied the requirements to sit based on completion of a credentialed residency program in neurology.

3. Create a timeline for yourself that includes time to complete the application process, gather resources, talk and collaborate with others, and thoroughly study for all the elements of the exam.

Suggestions for Studying for the NCS Exam

1. Evaluate the time you will need to prepare for the certification exam. Six months is most likely the minimum one should consider, though everyone learns at different paces. This is a recommendation only.

2. Schedule a set number of hours each day or week to specifically study evidenced-based literature and recommended texts.

3. Become a member of the Academy of Neurologic Physical Therapy (ANPT) to begin to receive the peer reviewed Journal of Neurologic Physical Therapy (JNPT) and other resources that are produced by the Section. JNPT for the iPad is available on the Apple app store for free. Dissemination of information to members is made through email blast.

4. Join Neurologic Special Interest Groups: http://www.neuropt.org/special-interest-groups. There are six special interest groups within the ANPT, including Balance and Falls, Brain Injury, Degenerative Diseases, Spinal Cord Injury, Stroke, and Vestibular Rehabilitation. Each group has posted resources and current documents relevant to that specific health condition. If you lack clinical experience within one of these practice areas of neurorehabilitation, you may find these Special Interest Group documents to be helpful in guiding your studying.

5. The Description of Specialty Practice on the APTA online store includes a free self-assessment tool so you can determine areas to focus your review.
   https://specialization.apta.org/become-a-specialist/neurology
   ***Note to Specialist Applicants**: As part of your application fee for board certification, you will receive the DSP: Neurologic and Self-Assessment Tool-so there is no need to order this separately!

6. A Candidate Guide available HERE offers information on the process of certification, sample questions, exam content outlines, and other helpful information for sitting for a specialist exam. Neuro-specific information begins on page 62.

7. Participate in the NCS Discussion Board which will be online beginning November through March. Information, guidance, and assistance in developing study groups is provided on this site.

8. Participate in the Academy of Neurologic Physical Therapy mentor/mentee program.
   http://www.neuropt.org/professional-resources/mentorship

9. Join the NeuroPT Listserve: http://www.neuropt.org/join/neuropt-listserve

10. Join or form study groups. When completing the Specialist Certification application to take the NCS examination, you have an option to request participation in an exam study group. Contact information of other applicants within your geographic region will be provided to you as a service run through the APTA Specialist Certification Program / American Board of Physical Therapy Specialties.

11. Access materials developed by the Neurology Section members to provide education covering the breadth and depth of a variety of settings and diagnoses in which NCS Physical Therapists work. Resources sited further in this document can be found on the APTA Learning Center (http://learningcenter.apta.org/default.aspx) and the ANPT Education Center (https://anpteducationcenter.org/).

12. Take advantage of the Section's website links to review outside resources and research specifically related to neurologic physical therapy. https://www.neuropt.org/research/research-resources Here you will find links to various research search engines.

13. Check out the Academy of Neurologic Physical Therapy outcome measures recommendations: http://www.neuropt.org/professional-resources/neurology-section-outcome-measures-recommendations

14. Attend the APTA Combined Sections Meetings to become immersed in the field attending courses, studying posters, visiting the booth, talking to authors and authorities in the field, and receive first-hand experience with the many therapists who have successfully attained certification.

NCS Resource List (2020)

Web-based resources

Diagnosis-Specific Evidence-based Resources

Brain Injury:
• https://erabi.ca/ (Evidence-Based Review of moderate to severe Acquired Brain Injury)
• http://tbims.org/combi/ (Center for Outcome Measurement in Brain Injury)
• https://www.impacttest.com/ (Concussion Management)
• http://www.cdc.gov/headsup/index.html (Heads Up Concussion)
• https://onf.org/ (Ontario Neurotrauma Foundation)

CVA:
• http://strokengine.ca (Evidence-based information about stroke for clinicians, patients, and families)
• www.ebrsr.com (Evidence-Based Review of Stroke Rehabilitation)

Huntington's Disease:
• http://www.euro-hd.net/html/network/groups/physio (European Huntington's Disease Physiotherapy Working Group Guidelines for Physiotherapists)
• https://hdsa.org/ (Huntington's Disease Society of America)

Parkinson's Disease:
• https://www.apdaparkinson.org/ (American Parkinson's Disease Association)

Multiple Sclerosis:
• https://www.nationalmssociety.org/For-Professionals/Clinical-Care/Resources-for-You-and-Your-Practice/Resources-and-Tools (Resource Guide for Clinicians by the NMSS)

Spinal Cord Injury:
• www.scireproject.com/home (Spinal Cord Injury Rehabilitation Evidence)
• www.elearnsci.org (web-based teaching and educational resource by the International Spinal Cord Society)
• http://www.asia-spinalinjury.org/ (American Spinal Injury Association)
• http://www.aci.health.nsw.gov.au/networks/spinal-cord-injury/spinal-seating (Spinal Seating Models)

Vestibular Disorders:
• https://vestibular.org/educational-resources (Vestibular Disorders Association)
• http://www.dizziness-and-balance.com/index.html (Chicago Dizziness and Hearing)

Evidence-based Resources (general, covers variety of diagnoses)

• https://www.apta.org/patient-care (access to Clinical Practice Guidelines, cases and clinical summaries)

• http://www.neuropt.org/professional-resources/evidence-based-neurologic-practice (This link provides a list of sources to access search engines and databases containing current literature relevant to neurorehabilitation)
•http://www.cochrane.org/ (Cochrane library)
•http://www.pedro.org.au/ (Physiotherapy Evidence Database (PEDro); wonderful resource to find critically-appraised RCTs)
http://guides.mclibrary.duke.edu/ebmtutorial (Introduction to Evidence-Based Practice Tutorials.)
http://www.cebm.net/ (Centre for Evidence-Based Medicine, University of Oxford, United Kingdom)

Outcome Measures

• https://www.sralab.org/rehabilitation-measures (Access to outcome measures, psychometric properties)
• www.neuropt.org/professional-resources/neurology-section-outcome-measures-recommendations (APTA EDGE task force recommendations)

Journals (free full-text after one-year embargo)

• https://academic.oup.com/ptj?navID=47244640522 (Physical Therapy Journal)
• www.jnpt.org (Journal of Neurologic Physical Therapy)
• http://stroke.ahajournals.org/ (Stroke, published by the American Heart Association)
• https://www.archives-pmr.org/ Archives of Physical Medicine and Rehabilitation

Web sites with a variety of diagnosis-specific resources

• http://www.neuropt.org (ANPT)
• http://www.bcm.edu/neurology/case.cfm (Baylor College of Medicine-Department of Neurology: Case of the Month)
• http://library.med.utah.edu/neurologicexam/html/home_exam.html (NeuroLogic Examination Videos and Descriptions: An Anatomical Approach (University of Utah)
• http://library.med.utah.edu/neurologicexam/cases/home_cases.html (NeuroLogic - companion website to the above site. Designed to lead participants through a systematic decision making process on four separate clinical cases. University of Utah)

Professional Issues

• http://www.apta.org/CulturalCompetence/ (Cultural Competence in Physical Therapy)
• http://www.apta.org/EthicsProfessionalism/ (Ethics and Professionalism)
• https://healthliteracy.osu.edu/ (Health literacy modules)
• http://www.aptahpa.org/ (APTA Section on Health Policy and Administration including information about LAMP Leadership Program)

• http://www.apta.org/CareerManagement/SelfAssessments/ (APTA Self-Assessment Tools including Core Values)
• http://www.apta.org/Documentation/ (APTA Guidelines for Documentation)

*The following pages provide resources to assist in preparing for the NCS exam. These include continuing education courses, online courses, as well as textbooks. The courses listed can be found at: http://learningcenter.apta.org/default.aspx.

Spinal Cord Injury

- Duan R, Qu M, Yuan Y, et al. Clinical benefit of rehabilitation training in Spinal Cord Injury. *Spine*. 2020;46(6):398-410. DOI: 10.1097/BRS.0000000000003789
- Farrow M, Nightingale TE, Maher J, McKay CD, Thompson D, Bilzon JLJ. Effect of exercise on cardiometabolic risk factors in adults with chronic spinal cord injury: A systematic review. *Archives of Physical Medicine and Rehabilitation*. 2020;101(12):2177-2205. DOI: 10.1016/j.apmr.2020.04.020
- Fehlings MG, Tetreault LA, Aarabi B, et al. A Clinical Practice Guideline for the Management of Patients With Acute Spinal Cord Injury: Recommendations on the Type and Timing of Rehabilitation. *Global Spine Journal*. 2017;7(3_suppl):231S-238S. DOI: 10.1177/2192568217701910
- Hornby TG, Reisman DS, Ward IG, et al. Clinical practice guideline to improve locomotor function following chronic stroke, incomplete spinal cord injury, and Brain Injury. *J Neurol Phys Ther*. 2020;44(1):49-100. DOI: 10.1097/NPT.0000000000000303
- Model Systems Knowledge Translation System. Living with Spinal Cord Injury. Accessed August 29,2022. https://msktc.org/sci
- Osinski T, Acapo S, Bensmail D, Bouhassira D, Martinez V. Central Nervous System reorganization and pain after spinal cord injury: Possible targets for physical therapy—A systematic review of neuroimaging studies. *Physical Therapy*. 2020;100(6):946-962. DOI: 10.1093/ptj/pzaa043
- Factsheets from the SCI SIG: Anterior Horn Syndrome, Brown-Sequard Syndrome, and Cauda Equina Syndrome

Brain Injury & Concussion

- Hornby, T. G., Reisman, D. S., Ward, I. G., Scheets, P. L., Miller, A., Haddad, D., ... & Walter, A. (2020). Clinical practice guideline to improve locomotor function following chronic stroke, incomplete spinal cord injury, and brain injury. J Neurol Phys Ther, 44(1), 49-100
- Leddy JJ, Haider MN, Ellis M, Willer BS. Exercise is Medicine for Concussion. *Curr Sports Med Rep*. 2018;17(8):262-270.DOI: 10.1249/JSR.0000000000000505
- Quatman-Yates CC, Hunter-Giordano A, Shimamura KK, et al. Physical Therapy Evaluation and Treatment After Concussion/Mild Traumatic Brain Injury. *J Orthop Sports Phys Ther*.

2020;50(4):CPG1-CPG73. DOI:10.2519/jospt.2020.0301
- Tefertiller C, Hays K, Natale A, et al. Results From a Randomized Controlled Trial to Address Balance Deficits After Traumatic Brain Injury. *Arch Phys Med Rehabil*. 2019;100(8):1409-1416. DOI:doi.org/10.1016/j.apmr.2019.03.015
- Vanderbeken I, Kerckhofs E. A systematic review of the effect of physical exercise on cognition in stroke and traumatic brain injury patients. *NeuroRehabilitation*. 2017;40(1):33-48. DOI:10.3233/NRE-161388

  10.1007/s11910-020-1022-z
- Ruiz-González L, Lucena-Antón D, Salazar A, Martín-Valero R, Moral-Munoz JA. Physical therapy in Down syndrome: systematic review and meta-analysis. *J Intellect Disabil Res*. 2019;63(8):1041-1067. DOI: 10.1111/jir.12606
- Winders P, Wolter-Warmerdam K, Hickey F. A schedule of gross motor development for children with Down syndrome. *J Intellect Disabil Res*. 2019;63(4):346-356. DOI: 10.1111/jir.12580

Stroke/CVA

- Hornby TG, Reisman DS, Ward IG, et al. Clinical Practice Guideline to Improve Locomotor Function Following Chronic Stroke, Incomplete Spinal Cord Injury, and Brain Injury. *J Neurol Phys Ther*. 2020;44(1):49-100. DOI:10.1097/NPT.0000000000000303
- Johnston TE, Keller S, Denzer-Weiler C, Brown L. A Clinical Practice Guideline for the Use of Ankle-Foot Orthoses and Functional Electrical Stimulation Post-Stroke. *J Neurol Phys Ther*. 2021;45(2):112-196. DOI:10.1097/NPT.0000000000000347
- Lee H, Park Y, Park S. The Effects of Virtual Reality Training on Function in Chronic Stroke Patients: A Systematic Review and Meta-Analysis. *BioMed Research International*. 2019: 1-12. DOI:10.1155/2019/7595639
- MacKay-Lyons M, Billinger SA, Eng JJ, et al. Aerobic exercise recommendations to optimize best practices in care after stroke: AEROBICS 2019 update. *Physical therapy*. 2020;100(1):149-156. DOI:10.1093/ptj/pzz153
- Moncion K, Biasin L, Jagroop D, et al. Barriers and facilitators to aerobic exercise implementation in stroke rehabilitation: A scoping review. *J Neurol Phys Ther*. 2020;44(3):179-187. DOI:10.1097/npt.0000000000000318
- Sharififar S, Shuster JJ, Bishop MD. Adding electrical stimulation during standard rehabilitation after stroke to improve motor function. A systematic review and meta-analysis. *Ann Phys Rehabil Med*. 2018;61(5):339-344. DOI:10.1016/j.rehab.2018.06.005
- Wu J, Cheng H, Zhang J, et al. Robot-assisted therapy for upper extremity motor impairment after stroke: a systematic review and meta-analysis. *Physical Therapy*. 2021;101(4). DOI:10.1093/ptj/pzab010

Degenerative Diseases (PD & HD)

- Fritz NE, Rao AK, Kegelmeyer D, Kloos A, Busse M, Hartel L, Carrier J, Quinn L. Physical therapy and exercise interventions in Huntington's disease: A mixed methods systematic review. Journal of Huntington's Disease. 2017;6:217–235. DOI: 10.3233/JHD-170260
- Lauzé M, Daneault JF, Duval C. The Effects of Physical Activity in Parkinson's Disease: A Review. *J Parkinsons Dis*. 2016;6(4):685-698. DOI: 10.3233/JPD-160790
- Leavy B, Joseph C, Löfgren N, Johansson H, Hagströmer M, Franzén E. Outcome Evaluation of Highly Challenging Balance Training for People With Parkinson Disease: A Multicenter Effectiveness-Implementation Study. *J Neurol Phys Ther*. 2020;44(1):15-22. DOI: 10.1097/NPT.0000000000000298
- Osborne J, Botkin R, Colon-Semenza C, et al. Physical Therapist Management of Parkinson Disease: A Clinical Practice Guideline from the American Physical Therapy Association. *Physical Therapy*, 2022;102:1–36. DOI: 10.1093/ptj/pzab302
- Playle R, Dimitropoulou P, Kelson M, Quinn L, Busse M. Exercise interventions in Huntington's disease: An individual patient data meta-analysis. *Movement Disorders Clinical Practice.* 2019; 6(7): 567–575. DOI: 10.1002/mdc3.12809
- Prime M, McKay JL, Bay AA, et al. Differentiating Parkinson Disease Subtypes Using Clinical Balance Measures.
  J Neurol Phys Ther. 2020;44(1):34-41. DOI: 10.1097/NPT.0000000000000297
- Quinn L, Kegelmeyer D, Kloos A, Rao AK, Busse M, Fritz NE. Clinical recommendations to guide physical therapy practice for Huntington disease. Neurology, 2020,94(5), 217-228.DOI: 10.1212/WNL.0000000000008887
- Rawson KS, McNeely ME, Duncan RP, Pickett KA, Perlmutter JS, Earhart GM. Exercise and Parkinson Disease: Comparing Tango, Treadmill, and Stretching. *J Neurol Phys Ther*. 2019;43(1):26-32. DOI: 10.1097/NPT.0000000000000245
- Reyes A, Bartlett DM, Rankin TJ, et al. Clinical Determinants of Dual Tasking in People With Premanifest Huntington's Disease. *Phys Ther*. 2021;101(4):pzab016. DOI: 10.1093/ptj/pzab016
- Rosenfeldt AB, Miller Koop M, Penko AL, Alberts JL. Individuals With Parkinson Disease Are Adherent to a High-Intensity Community-Based Cycling Exercise Program. *J Neurol Phys Ther*. 2022;46(2):73-80. DOI: 10.1097/NPT.0000000000000370
- Slade SC, Finkelstein DI, McGinley JL, Morris ME. Exercise and physical activity for people with Progressive Supranuclear Palsy: a systematic review. *Clin Rehabil*. 2020;34(1):23-33.DOI:10.1177/0269215519877235
- HDSA/APTA Continuing Education Course for Huntington's Disease https://hdsa.org/healthcare-professionals-resources/pt-continuing-education/

Multiple Sclerosis

- Amatya B, Khan F, Gaiea M. Rehabilitation for People with Multiple Sclerosis: An Overview of Cochrane Reviews. Cochrane Database Syst Rev. 2019; 1(1):1-41. DOI: 10.1002/14651858.CD012732.pub2
- Comber L, Galvin R, Coote S. Gait deficits in people with multiple sclerosis: A systematic review and meta-analysis. Gait & Posture. 2017;51:25-35. DOI: 10.1016/j.gaitpost.2016.09.026
- Edwards T. Pilutti LA. The effect of exercise training in adults with multiple sclerosis with severe mobility disability: A systematic review and future research directions. Multiple Sclerosis and Related Disorders.2017;16:31-39. DOI: 10.1016/j.msard.2017.06.003
- Kalb R, Brown TR, Coote S, et al. Exercise and lifestyle physical activity recommendations for people with multiple sclerosis throughout the disease course. Multiple Sclerosis Journal.2020;26(12):1459-1469. DOI: 10.1177/1352458520915629
- Kim Y, Mehta T, Lai B, Motl R. Immediate and sustained effects of interventions for changing physical activity in people with multiple sclerosis: Meta-analysis of randomized controlled trials. Arch Phys Med Rehabil. 2020;101 (8):1414-1436. DOI: 10.1016/j.apmr.2020.03.017
- Monaghan AS, Mansfield A, Huisinga JM, & Peterson DS. Examining the Relationship between Reactive Stepping Outcomes and Falls in People with Multiple Sclerosis. *Physical Therapy*. 2022; 102:1-8.DOI: 10.1093/ptj/pzac041
- Pearson M, Dieberg G, Smart N. Exercise as a therapy for improvement of walking ability in adults with Multiple Sclerosis: a meta-analysis. Archives of PM&R.2015;96:1339-1348. DOI: 10.1016/j.apmr.2015.02.011
- Sandroff BM, Jones CD, Baird JF, Motl RW. Systematic Review on Exercise Training as a Neuroplasticity-inducing behavior in Multiple Sclerosis. Neurorehabil Neural Repair. 2020;34(7):575-588. DOI: 10.1177/1545968320921836

Motor Neuro Disease (ALS & PLS)

- Clawson LL, Cudkowicz M, Krivickas L. et al. A randomized controlled trial of resistance and endurance exercise in amyotrophic lateral sclerosis. *ALS and Frontotemporal Degeneration*. 2018;19:250–258. DOI: 10.1080/21678421.2017.1404108
- Dal Bello-Haas V, Florence JM. Therapeutic exercise for people with amyotrophic lateral sclerosis or motor neuron disease. *Cochrane Database of Systematic Reviews*. 2013, Issue 5. CD005229. DOI: 10.1002/14651858.CD005229.pub3
- Dal Bello-Haas V. Physical therapy for individuals with amyotrophic lateral sclerosis: current insights. *Degenerative neurological and neuromuscular disease*. 2018;8:45–54. DOI: 10.2147/DNND.S146949
- Meng L, Li X, Li C, Tsang RC, Chen Y, Ge Y, Gao Q. Effects of exercise in patients with amyotrophic lateral sclerosis: a systematic review and meta-analysis. *American Journal of Physical Medicine & Rehabilitation*. 2020 Sep 1;99(9):801-10. DOI: 10.1097/PHM.0000000000001419
- Park D, Kwak SG, Park JS, Choo YJ, Chang MC. Can therapeutic exercise slow down progressive

functional decline in patients with amyotrophic lateral sclerosis? A Meta-Analysis. *Frontiers in Neurology*. 2020;11:853. DOI: 10.3389/fneur.2020.00853

- Soofi AY, Dal Bello-Haas V, Kho ME, Letts L. The impact of rehabilitative interventions on quality of life: a qualitative evidence synthesis of personal experiences of individuals with amyotrophic lateral sclerosis. *Quality of Life Research.* 2018; 27:845–856. DOI: 10.1007/s11136-017-1754-7

Vestibular

- Basura GJ, Adams ME, Monfared A, et al. Clinical Practice Guideline: Ménière's Disease. *Otolaryngology–Head and Neck Surgery*. 2020;162(2_suppl):S1-S55. DOI: 10.1177/0194599820909438
- Bhattacharyya N, Gubbels SP, Schwartz SR, et al. Clinical Practice Guideline: Benign Paroxysmal Positional

  Vertigo (Update). *Otolaryngol Head Neck Surg*. 2017;156(3_suppl):S1-S47. DOI: 10.1177/0194599816689667
- Galgon, A. K., Tate, A., Fitzpatrick, M., & Schoenewald, W. W. (2021). Agreement Between Physical Therapists in Diagnosing Benign Paroxysmal Positional Vertigo. *J Neurol Phys Ther*, 45(2), 79-86. DOI: 10.1097/npt.0000000000000349
- Hall CD, Herdman SJ, Whitney SL, et al. Vestibular Rehabilitation for Peripheral Vestibular Hypofunction: An Updated Clinical Practice Guideline from the Academy of Neurologic Physical Therapy of the American Physical Therapy Association. *J Neurol Phys Ther*. 2022;46(2):118-177. DOI: 10.1097/npt.0000000000000382
- Rodriguez DL, Ledesma AL, de Oliveira CA. Physical therapy for posterior and horizontal canal benign paroxysmal positional vertigo: Long-term effect and recurrence: a systematic review. Int Arch Otorhinolaryngol 2018;22:455–459. DOI: 10.1055/s-0037-1604345

Balance & Falls

- Gill-Body KM, Hedman LD, Plummer L, et al. Movement system diagnoses for balance dysfunction: recommendations from the academy of neurologic physical Therapy's movement system task force. *Physical therapy*. 2021;*101*(9). DOI: 10.1093/ptj/pzab153
- Lurie JD, Zagaria AB, Ellis L, et al. Surface perturbation training to prevent falls in older adults: a highly pragmatic, randomized controlled trial. *Physical therapy*. 2020;*100*(7):1153-1162. DOI: 10.1093/ptj/pzaa023
- Lusardi MM, Fritz S, Middleton A, et al. Determining Risk of Falls in Community Dwelling Older Adults: A Systematic Review and Meta-analysis Using Posttest Probability. *J Geriatr Phys Ther*. 2017;40(1):1-36. DOI: 10.1519/jpt.0000000000000099
- Omaña H, Bezaire K, Brady K, et al. Functional reach test, single-leg stance test, and Tinetti performance-oriented mobility assessment for the prediction of falls in older adults: a systematic review. *Physical Therapy*. 2021;*101*(10). DOI: 10.1093/ptj/pzab173
- Rimland JM, Abraha I, Dell'Aquila G, et al. Effectiveness of Non-Pharmacological Interventions to

Prevent Falls in Older People: A Systematic Overview. The SENATOR Project ONTOP Series. *PLoS ONE*. 2016;11(8). DOI: 10.1371/journal.pone.0161579

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- Tang A, Tao A, Soh M, et al. The effect of interventions on balance self-efficacy in the stroke population: a systematic review and meta-analysis. *Clin Rehabil*. 2015;29(12):1168-1177. DOI: 10.1177/0269215515570380
- Verma SK, Willetts JL, Corns HL, et al. Falls and Fall-Related Injuries among Community-Dwelling Adults in the United States. *PLoS One*. 2016;11(3):e0150939. DOI: 10.1371/journal.pone.0150939
- Yuzlu V, Oguz S, Timurtas E, et al. The Effect of 2 Different Dual-Task Balance Training Methods on Balance and Gait in Older Adults: A Randomized Controlled Trial. *Physical Therapy*. 2022;*102*(3), pzab298. DOI: 10.1093/ptj/pzab298

Pediatric Neuro

- Cobo-Vicente F, San Juan AF, Larumbe-Zabala E, Estévez-González AJ, Donadio MVF, Pérez-Ruiz M. Neuromuscular Electrical Stimulation Improves Muscle Strength, Biomechanics of Movement, and Functional Mobility in Children With Chronic Neurological Disorders: A Systematic Review and Meta-Analysis. *Phys Ther*. 2021;101(10):pzab170. DOI: 10.1093/ptj/pzab170
- Crytzer TM, Keramati M, Anthony SJ, Cheng YT, Robertson RJ, Dicianno BE. Exercise Prescription Using a Group-Normalized Rating of Perceived Exertion in Adolescents and Adults With Spina Bifida [published correction appears in PM R. 2018 Oct;10(10):1134]. *PM R*. 2018;10(7):738-747. DOI: 10.1016/j.pmrj.2018.01.004
- Harbourne RT, Dusing SC, Lobo MA, et al. START-Play Physical Therapy Intervention Impacts Motor and Cognitive Outcomes in Infants With Neuromotor Disorders: A Multisite Randomized Clinical Trial. *Phys Ther*. 2021;101(2):pzaa232. DOI: 10.1093/ptj/pzaa232
- Novak I, Morgan C, Fahey M, et al. State of the Evidence Traffic Lights 2019: Systematic Review of Interventions for Preventing and Treating Children with Cerebral Palsy. *Curr Neurol Neurosci Rep*. 2020;20(2):3. DOI: 10.1007/s11910-020-1022-z
- Ruiz-González L, Lucena-Antón D, Salazar A, Martín-Valero R, Moral-Munoz JA. Physical therapy in Down syndrome: systematic review and meta-analysis. *J Intellect Disabil Res*. 2019;63(8):1041-1067. DOI: 10.1111/jir.12606
- Winders P, Wolter-Warmerdam K, Hickey F. A schedule of gross motor development for children with Down syndrome. *J Intellect Disabil Res*. 2019;63(4):346-356. DOI: 10.1111/jir.12580

Wheelchair, Seating & Assistive Technology

- Keeler L, Kirby RL, Parker K, McLean KD, Hayden J. Effectiveness of the Wheelchair Skills Training Program: a systematic review and meta-analysis. Disabil Rehabil Assist Technol 2019;14(4):391-409. DOI: 10.1080/17483107.2018.1456566
- Kenyon LK, Hostnik L, McElroy R, Peterson C, Farris JP. Power Mobility Training Methods for Children: A Systematic Review. *Pediatr Phys Ther*. 2018;30(1):2-8. DOI: 10.1097/PEP.0000000000000458
- Medola FO, Elui VM, Santana Cda S, Fortulan CA. Aspects of manual wheelchair configuration affecting mobility: a review. J Phys Ther Sci. 2014 Feb;26(2):313-8. DOI: 10.1589/jpts.26.313
- Fact Sheets from the ANPT Assistive Technology/Seating and Wheeled Mobility Special Interest Group

Outcome Measures

- Godi M, Arcolin I, Leavy B, Giardini M, Corna S, Franzén E. Insights into the mini-bestest scoring system: Comparison of 6 different structural models. *Physical Therapy*. 2021;101(10). DOI:10.1093/ptj/pzab180
- McCulloch KL, de Joya AL, Hays K, et al. Outcome Measures for Persons With Moderate to Severe Traumatic Brain Injury: Recommendations From the American Physical Therapy Association Academy of Neurologic Physical Therapy TBI EDGE Task Force. *J Neurol Phys Ther*. 2016;40(4):269-280. DOI: 10.1097/npt.0000000000000145
- Moore JL, Potter K, Blankshain K, Kaplan SL, O'Dwyer LC, Sullivan JE. A core set of outcome measures for adults with neurologic conditions undergoing rehabilitation. *J Neurol Phys Ther*. 2018;42(3):174-220. DOI:10.1097/npt.0000000000000229

Research & Statistics

- Jewell DV. Guide to Evidence-Based Physical Therapist Practice. 4th ed. Jones & Bartlett Learning; 2017. (Specifically Chapters 9, 10, and 13)
- Watkins MP, Portney LG. Foundations of Clinical Research: Applications to Practice. 3rd ed. FA Davis Company; 2015.
- Web-based tutorial on evidence-based practice developed by the Icahn School of Medicine at Mount Sinai can be accessed at: https://libguides.mssm.edu/ebm

Miscellaneous

- Dos Anjos S, Morris D, Taub E. Constraint-Induced Movement Therapy for Lower Extremity Function: Describing the LE-CIMT Protocol. *Phys Ther*. 2020;100(4):698-707. DOI: 10.1093/ptj/pzz191
- Leech KA, Roemmich RT, Gordon J, Reisman DS, Cherry-Allen KM. Updates in Motor Learning: Implications for Physical Therapist Practice and Education. *Phys Ther*. 2022;102(1):pzab250. DOI: 10.1093/ptj/pzab250

Textbook recommendations are based on previous test-taker feedback about how they prepared for the exam. They may provide a nice review of information in areas you feel less comfortable, but we encourage you not to rely solely on texts for your preparation. The information is generally too basic a level and at times, outdated.

The NCS committee acknowledges that this is not an all-inclusive list of web-based resources or APTA Learning Center courses to support individuals preparing for the NCS exam. Rather, we have attempted to select those resources and courses that were: 1) sponsored by APTA, 2) directly applicable to Neurologic Description of Specialty Practice topics, and/or 3) had been used by task force members and were deemed beneficial for neurologic physical therapy learning. Therapists are encouraged to select web-based resources and APTA Learning Center courses to best meet their individual study needs. **Use of these resources does not ensure that the therapist will pass the NCS exam.**

Neurologic Description of Specialty Practice Curricular Topics linked with resources	
I. KNOWLEDGE AREAS	Available APTA learning center resources http://learningcenter.apta.org/Courses.aspx Academy of Neurologic Physical Therapy Education Center courses https://anpteducationcenter.org/
A. Foundation Sciences	
Human Anatomy and Physiology in healthy and neurologic populations • *Musculoskeletal system* • *Cardiovascular and pulmonary systems* • *Integumentary system* • *Exercise Physiology* • *Electrophysiology*	**APTA Learning Center:** Concussion: Evidence-Informed Rehabilitation on the C-Spine and Vestibular System Defining Dizziness: A Home Healthcare Approach to Vestibular Disorders **ANPT Education Center:** Huntington's Disease Module 1-Overview of Huntington's Disease

	Texts: Blumenfeld H. Neuroanatomy through Clinical Cases. Second Edition. Sunderland, MA: Sinauer Associates, Inc, 2010. Goldberg, S. Clinical Neuroanatomy Made Ridiculously Simple (5th ed). Interactive Edition. Miami, Florida: MedMaster, 2014. Haines DE, Mihailoff GA. Fundamental Neuroscience for Basic and Clinical Applications (5th ed). Philadelphia: Churchhill Livingston, 2017. Lundy-Ekman L. Neuroscience Fundamentals for Rehabilitation (5th ed). Philadelphia: W.B. Saunders Company, 2017. Goodman CC, Fuller KS. Pathology: Implications for the Physical Therapist-4th ed. Philadelphia PA: Saunders, 2014. Simon RP, Greenberg D, Aminoff MA, eds. Lange Clinical Neurology – 10th Edition. McGraw Hill Co, Inc., 2017
Neuroanatomy and Neurophysiology • *Anatomical organization and functional specialization* • *Age-related changes across the life span, including developmental neuroanatomy* • *Neural growth and plasticity, such as cortical remodeling, activity-dependent changes* • *Neurotransmission and neurotransmitters* • *Perception and sensory systems* • *Motor systems* • *Neural control of locomotion, such as central pattern generators* • *Neural control of balance and postural control* • *Regulation and modulation of reflexes* • *Regulation and modulation of autonomic function*	**APTA Learning Center:** Neuromuscular Changes with Aging (part of Geriatrics Focus for the Physical Therapist – 2016) A Primer on Pain for the Practicing Physical Therapist Pain, Plasticity and Physical Therapy: Applications of Graded Motor Imagery New Directions and Considerations in Neurorehabilitation Defining Dizziness: A Home Healthcare Approach to Vestibular Disorders Physical Therapy Considerations of Neurologic Presentations in COVID-19 **Texts**: Blumenfeld H. Neuroanatomy through Clinical Cases. Second Edition. Sunderland, MA: Sinauer Associates, Inc, 2010.

• *Pain, including neurogenic and nonneurogenic*	Goldberg, S. Clinical Neuroanatomy Made Ridiculously Simple (5th ed). Interactive Edition. Miami, Florida: MedMaster, 2014.
Movement sciences • *Biomechanics and kinesiology of movement systems* • *Kinematic and kinetic analysis of functional movements, postural control, and gait* • *Pathokinesiology of functional movement, such as gait, posture, and reaching* • *Theories and principles of motor control* • *Theories and principles of skill acquisition and motor learning* • *Theories and principles of motor development* • *Interrelationships among social, cognitive, and movement systems* • *Effects of movement dysfunctions on multiple body systems, including immediate and long-term*	**ANPT Education Center:** Movement System 1 – Diagnoses in Neurologic Physical Therapy Movement System 2 – Task Analysis in Neurologic Physical Therapy Movement System 3 – Balance Diagnoses in Neurologic Physical Therapy **Texts:** Goodman CC, Fuller KS. Pathology: Implications for the Physical Therapist-4th ed. Philadelphia PA: Saunders, 2014. Goodman CC, Snyder TK. Differential Diagnosis for Physical Therapists: Screening for Referral-6th edition. St. Louis, MO: Saunders, 2017. Neumann DA. Kinesiology of the Musculoskeletal System: Foundations for Rehabilitation. 3rd edition. St. Louis, MO: Mosby Elsevier, 2016. Schmidt RA, et al. Motor Control and Learning: A Behavioral Emphasis (6th ed). Champaign, Illinois: Human Kinetics, 2018. Shumway-Cook A, Woollacott MH. Motor Control: Translating Research into Clinical Practice. 5th edition. Baltimore, MD; Lippincott Williams & Wilkins, 2016.

B. Behavioral Sciences	
Psychology and neuropsychology, including knowledge of: • *Cognitive processes (attention, memory, and executive dysfunction)*	**Texts**: Ropper A. Disorders of the Nervous System Caused by Alcohol, Drugs, Toxins, and Other Chemical Agents in Adams and Victor's

• *Cognitive, language, and learning disorders* • *Affective and behavioral disorders* • *Expected emotional and behavioral responses, and individualized coping strategies to illness and recovery* • *Influence of motivational factors and adherence strategies to facilitate behavioral change on illness and recovery* • *Impact of cultural and social systems on illness and recovery*	Principles of Neurology. 11th ed. McGraw-Hill Companies, Inc; 2019:1209-1256. Gillen G. Managing Attention Deficits to Optimize Function in Cognitive and Perceptual Rehabilitation Optimizing Function. St Louis, MO: Mosby Elsevier; 2009: 184-209.
Psychiatry including knowledge of: • *Common psychiatric symptoms, syndromes, and classifications* • *Effect of psychiatric disease and treatment on cognition, learning, and function* • *Aphysiologic presentation, such as functional movement disorder*	**Texts:** Ropper A. Part 6: Psychiatric Disorders in Adams and Victor's Principles of Neurology. 11th ed. McGraw-Hill Companies, Inc; 2019:1505-1558.
Teaching and learning theory • *Principles of teaching and learning* • *Development and implementation of educational planning process*	**Texts**: Bastable S, Gramet P, Jacobs K, Sopczyk D. Health Professional as Educator: Principles of Teaching and Learning. 2nd ed. Sudbury MA; Jones & Bartlett Learning, 2019. Jensen GM and Mostrom E. Handbook of Teaching and Learning for Physical Therapists. 3rd ed. Elsevier Health Sciences, 2012. Plack M, Driscoll M (eds). Teaching and Learning in Physical Therapy: From Classroom to Clinic. 2nd ed. Thorofare, NJ: Slack, Inc, 2017.
C. Clinical Sciences	
Pathology, including congenital and acquired pathology/pathophysiology of: • *Neuromuscular system* • *Musculoskeletal system* • *Cardiovascular and pulmonary system* • *Physiologic response to trauma and stress*	**APTA Learning Center:** Neuromuscular Changes with Aging (Part of Geriatrics Focus for the Physical Therapist – 2016) **Text:** Goodman CC, Fuller KS. Pathology: Implications for the Physical Therapist-4th ed. Philadelphia PA: Saunders, 2014.

• *Impact of neurologic conditions on other body systems*	
Epidemiology, including knowledge of: • *Incidence and prevalence* • *Prognostic factors* • *Risk factors relevant to health status across the lifespan* • *Natural history, morbidity, and mortality*	**Texts:** Goodman CC, Fuller KS. Pathology: Implications for the Physical Therapist-4th ed. Philadelphia PA: Saunders, 2014. Haynes RB, Sackett DL, Guyatt et al. Clinical Epidemiology: How to Do Clinical Practice Research. 3rd edition. Philadelphia, PA: Lippincott Williams & Wilkins, 2006.
Medical management, including knowledge of: • *Imaging, such as MRI, f-MRI, CT Scans, and PET Scans* • *Clinical diagnostic procedures, such as EMG, NCV, and evoked potential exam* • *Laboratory tests, including normal and abnormal findings* • *Surgical and nonsurgical interventions performed for neurologic conditions* • *Assessment, monitoring, and activity modifications related to medical procedures*	**APTA Learning Center:** Neurology: Treating CVA, TBI, and MS in the Home Health Setting **Text:** Goodman CC, Fuller KS. Pathology: Implications for the Physical Therapist-4th ed. Philadelphia PA: Saunders, 2014.
Pharmacology, including knowledge of: • *Pharmacokinetics and pharmacodynamics* • *Abnormal drug reactions, interactions, and adverse dosage effects*	**APTA Learning Center:** Pharmacology in Rehabilitation: Neuromuscular Medications Pharmacology for the Home Health Physical Therapist **Text:** Ciccone CD. Pharmacology in Rehabilitation -5th ed. FA Davis, 2016
D. Clinical Reasoning and Critical Inquiry	

• *Application of decision-making algorithms and models to clinical practice* • *Integration of the ICF framework to inform clinical decisions and prioritize plan of care* • *Clinical research methodology appraisal* • *Critical evaluation of test psychometrics and application of principles of measurement in clinical practice* • *Judicious evaluation of components and merit of published evidence*	**APTA Learning Center:** The International Classification of Functioning, Disability, and Health: Overview **ANPT Education Center:** Clinical Decision Making **Texts:** How to use the ICF: A practice manual http://www.who.int/classifications/drafticfpracticalmanual.pdf International Classification of Functioning, Disability and Health (ICF) http://www.apta.org/ICF/ Carter R, Lubinsky J, Domholdt E. Section Six: Measurement in Rehabilitation Research Principles and Application. 5th ed. St. Louis, MO: Elsevier Saunders; 2015: 231-258. Law M and MacDermid J (eds.) Evidence-Based Rehabilitation: A Guide to Practice. 3rd Ed. Thorofare, NJ. SLACK Incorporated; 2013; 121-139.
II. Professional Roles, Responsibilities, and Values of Neurologic Clinical Specialists	
A. Communication	
• *Employs effective communication strategies in individuals with neurologic conditions, including verbal, nonverbal, and assistive technologies* • *Empowers individuals in the management of their own health* • *Facilitates collaborative team management and transitions of care for individuals with neurologic conditions* • *Addresses cultural or social issues that affect the plan of care*	**APTA Learning Center:** Rehabilitation of Individuals with Dementia Professionalism Module 1: Introduction to Professionalism Professionalism Module 2: History of Professionalism in Physical Therapy Professionalism Module 3: Ethical Compass

B. Education	
• *Performs a needs assessment, including determining the educational needs and unique characteristics of the learners and group of learners* • *Develops educational objectives based on the learning needs of individuals and their families, significant others, and caregivers; colleagues; and/or the public with consideration of learning domains and level of expected outcomes for learners and groups of learners* • *Develops and customizes appropriate teaching strategies and methods based on learning objectives and identified learning style preferences of individuals and their families, significant others, and caregivers* • *Implements an educational plan that includes explanation, demonstration, practice, and effective use of feedback as appropriate* • *Accurately and objectively assesses learning outcomes of teaching strategies and modifies strategies based on outcomes* • *Educates physical therapy students and colleagues to enhance knowledge and skills in neurologic physical therapy* • *Educates health care professionals outside of physical therapy and outside agencies about neurologic physical therapy*	**Texts:** Bastable S, Gramet P, Jacobs K, Sopczyk D. Health Professional as Educator: Principles of Teaching and Learning. 2nd ed. Sudbury MA; Jones & Bartlett Learning, 2019. Jensen GM and Mostrom E. Handbook of Teaching and Learning for Physical Therapists. 3rd ed. Elsevier Health Sciences, 2012. Jensen GM, Gwyer JM, Hack LM, Shepard KF. Expertise in Physical Therapy Practice. 2nd ed. Philadelphia: W.B. Saunders Company, 2006 Plack M, Driscoll M (eds). Teaching and Learning in Physical Therapy: From Classroom to Clinic. 2nd ed. Thorofare, NJ: Slack, Inc, 2017.

• *Educates community groups in primary, secondary, and tertiary prevention*	
C. Consultation	
• *Synthesizes information from a wide variety of sources when providing consultative services to colleagues* • *Effectively contributes to multidisciplinary team decision-making to maximize patient and client outcomes* • *Renders specialist opinion about patients and clients with neurological dysfunction to other health professionals and external organizations* • *Provides peer and utilization review*	**Texts:** Guide to Physical Therapist Practice 3.0. Alexandria, VA: American Physical Therapy Association; 2014. Available at: http://guidetoptpractice.apta.org/
D. Evidence-Based Practice	
• *Evaluates the efficacy and effectiveness of new and established examination tools, interventions, and technologies* • *Critically appraises peer-reviewed evidence and judiciously translates evidence into practice* • *Participates in conducting and disseminating clinical research following ethical guidelines* • *Participates in collecting and interpreting patient and client outcomes data, such as programmatic assessment* • *Synthesizes information from a variety of sources, such as clinical practice guidelines, to develop evidence-based clinical practice*	**APTA Learning Center:** New Directions and Considerations in Neurorehabilitation Dosing and Rehabilitation: Balance and Vestibular Related Impairments (pediatrics based course) **ANPT Education Center:** Multiple Sclerosis Outcome Measure Case Study Contraversive Pushing: Physical Therapy Decision Making for Patient Prognosis Post-Stroke: Navigating the continuum of care **Texts:** Jewell, D. Guide to Evidence-Based Physical Therapy Practice. 4th edition. Sudbury MA, Jones & Bartlett Learning, 2017.

E. Prevention, Wellness, and Health Promotion	
• *Develops and implements programs to promote health and fitness at the individual and societal level* • *Promotes health and quality of life for individuals with and without neurologic conditions* • *Establishes screening programs for neurologic problems and uses screening programs to identify at-risk populations*	**APTA Learning Center:** Physical Fitness Training After Stroke **ANPT Education Center:** Health Promotion & Wellness Strategies Applied to Neurorehabilitation IV STEP: Prevention from a IV STEP Perspective **Texts:** Rush Thompson C. Prevention Practice for Neuromuscular Conditions in Prevention Practice: A Physical Therapist Guide to Health, Fitness and Wellness. 1st ed. Thorofare, NJ. SLACK Incorporated; 2007:185-200.
F. Social Responsibility and Advocacy	
• *Seeks unique solutions to challenging problems for the individual patient or client, such as access to health services, equipment, and community resources* • *Advocates for neurologically impaired individuals with policy- and lawmaking bodies* • *Promotes advanced neurologic practice at the local, regional, national, and/or international levels* • *Represents neurologic physical therapy to other professionals and professional organizations*	**APTA Learning Center:** Social Responsibility in PT: Promoting Equity Through Community and Global Health Professionalism Module 1: Introduction to Professionalism Professionalism Module 2: History of Professionalism in Physical Therapy Professionalism Module 3: Ethical Compass **ANPT Education Center:** Huntington's Disease Module 5 – Reimbursement Issues Health Promotion & Wellness Strategies Applied to Neurorehabilitation IV STEP: Integrating Participation into PT **Texts:**

	Other professional Roles. Consultation. Guide to Physical Therapist Practice 3.0. Alexandria, VA: American Physical Therapy Association; 2014. Available at: http://guidetoptpractice.apta.org/
G. Leadership	
• *Models and facilitates ethical principles in decision-making and interpersonal interactions* • *Pursues opportunities to mentor others and seeks mentors to expand own knowledge, skills and abilities* • *Resolves conflicts or challenging situations using multiple strategies* • *Models and facilitates the translation of evidence into clinical practice* • *Facilitates the use of evidence to shape system policies and procedural change*	**APTA Learning Center:** Professionalism Module 1: Introduction to Professionalism Professionalism Module 2: History of Professionalism in Physical Therapy Professionalism Module 3: Ethical Compass **ANPT Education Center:** Becoming a Good Mentor **Other Resources:** http://www.apta.org/Ethics/Core/ Information on APTA's Ethics Documents https://www.aptahpa.org/page/LAMP (APTA Section on Health Policy and Administration including information about LAMP Leadership Program) http://www.apta.org/CareerManagement/SelfAssessments/ (APTA Self-Assessment Tools including Core Values) http://www.abpts.org/Certification/About/Process/ (ABPTS Self-Assessment for Neurologic Specialty)
H. Professional Development	
• *Practices active reflection and self-evaluation* • *Models and facilitates a continued pursuit of additional and advanced knowledge, skills, and competencies* • *Maintains current knowledge of regional, national, and international developments that impact neurologic physical therapist practice*	**APTA Learning Center:** Professionalism Module 1: Introduction to Professionalism Professionalism Module 2: History of Professionalism in Physical Therapy Professionalism Module 3: Ethical Compass **Other Resources:**

	http://www.apta.org/CareerManagement/SelfAssessments/ (APTA Self-Assessment Tools including Core Values) http://www.abpts.org/Certification/About/Process/ (ABPTS Self-Assessment for Neurologic Specialty)
III. Patient and Client Management	
A. Patient and Client Examination	
Examination *(includes history, systems review, tests and measures--large section of DSP)* **Evaluation** *•Skillfully interprets observed movement and function, particularly when objective measures are not available or cannot be applied* *•Differentiates examination findings across ICF domains that require remediation versus compensatory strategies* *•Links examination findings, personal modifiers, and environmental factors, with the individual's and caregiver's expressed goal(s)* *•Integrates examination findings obtained by other health care professionals* *•Develops sound clinical judgments based on data collected from the examination* **Diagnosis**	**APTA Learning Center:** Concussion: Evidence-Informed Rehabilitation on the C-Spine and Vestibular System Defining Dizziness: A Home Healthcare Approach to Vestibular Disorders Physical Therapy Considerations of Neurologic Presentations in COVID-19 **ANPT Education Center:** Huntington's Disease Module 2- Physical Therapy Evaluation of Individuals with Huntington's Disease Across Disease Stages Real-time decision making for patient prognosis post-stroke: navigating the continuum of care IV STEP: Movement System Diagnosis & Prediction Differential Diagnosis and Management of Vestibular Migraine vs. Meniere's Disease Integrating Current Evidence into Vestibular Rehabilitation Educational Programs **Texts**: Palisano RJ, Orlin M, Schreiber J. Campbell's Physical Therapy for Children 5th ed. St. Louis, MO: Elsevier Saunders, 2016. Herdman SJ, Clendaniel R. Vestibular Rehabilitation 4th ed. Philadelphia: F.A. Davis, 2014.

• *Differentially diagnoses emergent versus nonemergent neurologic signs and symptoms* • *Differentially diagnoses body function, body structures, and functional performance findings consistent or inconsistent with health condition, and if amenable to intervention* • *Confers with other professionals regarding examination needs that are beyond the scope of physical therapy and refers as appropriate* **Prognosis** • *Analyzes barriers, such as resources and psychosocial barriers, that limit the individual in achieving optimal outcomes based on neurologic condition* • *Predicts potential for recovery and time to achieve optimal level of improvement across the ICF domains* • *Collaborates with individuals and their families, significant others, and caregivers in setting goals* • *Develops a plan of care that prioritizes interventions related to the recovery process, patient and client goals, and resources* • *Develops a plan of care that prioritizes interventions related to all levels of prevention, health, and wellness.*	O'Sullivan SB and Schmitz TJ. Physical Rehabilitation 7th ed. Philadelphia: F.A. Davis, 2019. Umphred DA, Lazaro RT, Roller M, Burton G. Neurological Rehabilitation 7th ed. St. Louis: Mosby, 2020.
B. Intervention	

Clinical Decision-Making and Prioritization of Interventions • *Selects and, if needed, modifies interventions based on potential short-term impact and secondary prevention benefits with consideration of the individual's body function and structure, activity limitations, and participation restrictions* • *Selects and, if needed, modifies interventions based on physiological or behavioral changes across the lifespan* • *Prioritizes optimal interventions based on type and severity of impairments in body function and structures, activity limitations, and participation restrictions* • *Analyzes risk versus benefit when selecting interventions* • *Negotiates interventions with the patient or client and family, significant others, and caregivers* • *Modifies or continues intervention based on ongoing evaluation*	**APTA Learning Center:** Concussion: Evidence-Informed Rehabilitation on the C-Spine and Vestibular System Defining Dizziness: A Home Healthcare Approach to Vestibular Disorders Dosing and Rehabilitation: Balance and Vestibular Related Impairments (pediatrics based course) Rehabilitation and Dosing for Children with Cerebral Palsy Neurology: Treating CVA, TBI, and MS in the Home Health Setting Physical Therapy Considerations of Neurologic Presentations in COVID-19 **ANPT Education Center:** Huntington's Disease Module 3- Physical Therapy Management of Individuals in Early to Middle Stages of Huntington's Disease Huntington's Disease Module 4- Physical Therapy Management of Individuals in Late Stages of Huntington's Disease Differential Diagnosis and Management of Vestibular Migraine vs. Meniere's Disease Peripheral Vestibular Hypofunction CPG Set into Action **Texts**: O'Sullivan SB and Schmitz TJ. Physical Rehabilitation 7th ed. Philadelphia: F.A. Davis, 2019. Umphred DA, Lazaro RT, Roller M, Burton G. Neurological Rehabilitation 7th ed. St. Louis: Mosby, 2020.
Coordination, Communication, Documentation	**Texts:**

• *Adapts communication to meet the diverse needs of the patient or client and family, significant others, and caregivers, such as cultural, age-specific, educational, and cognitive needs.* • *Adapts communication to meet the health literacy needs of the patient or client and family, significant others, and caregivers.* • *Asks questions which help to determine an in-depth understanding of the patient's or client's problems.* • *Coordinates patient and client management across care settings, disciplines, and community and funding resources.*	*Guide to Physical Therapist Practice 3.0*. Alexandria, VA: American Physical Therapy Association; 2014. http://guidetoptpractice.apta.org/ Quinn L, Gordon J. Documentation for Rehabilitation: A Guide to Clinical Decision Making in Physical Therapy. 3rd Edition. Saunders/Elsevier, 2015. **Other Resources:** http://www.apta.org/Documentation/
Patient and Client Instruction • *Educates patient or client and family, significant others, and caregivers on diagnosis, prognosis, treatment, responsibility, and self-management within the plan of care* • *Provides instruction aimed at risk reduction, prevention, and health promotion* • *Provides instruction using advances in technology, such as web-based resources*	**ANPT Education Center:** Health Promotion & Wellness Strategies Applied to Neurorehabilitation **Texts**: O'Sullivan SB and Schmitz TJ. Physical Rehabilitation 7th ed. Philadelphia: F.A. Davis, 2019. Umphred DA, Lazaro RT, Roller M, Burton G. Neurological Rehabilitation 7th ed. St. Louis: Mosby, 2020.
Procedural Interventions • *Therapeutic exercises* • *Functional training in self-care and in domestic, education, work, community, social and civic life* • *Manual therapy techniques*	**APTA Learning Center:** Concussion: Evidence-Informed Rehabilitation on the C-Spine and Vestibular System Defining Dizziness: A Home Healthcare Approach to Vestibular Disorders

• *Prescription, application, and, as appropriate,, fabrication of devices and equipment, including assistive, adaptive, orthotic, protective, supportive, or prosthetic* • *Airway clearance techniques* • *Integumentary repair and protective techniques* • *Electrotherapeutic modalities*	Dosing and Rehabilitation: Balance and Vestibular Related Impairments (pediatrics based course) Rehabilitation and Dosing for Children with Cerebral Palsy Neurology: Treating CVA, TBI, and MS in the Home Health Setting
C. Outcomes Assessment	
• *Selects appropriate outcome measures, such as sensitive and responsive, across the ICF domains, based on patient or client acuity, diagnosis, prognosis, and practice setting* • *Adjusts the plan of care within and across episodes based on interpretation of outcome measure results* • *Analyzes and interprets patient and client outcomes to modify own future practice and perform programmatic assessments*	**APTA Learning Center:** New Directions and Considerations in Neurorehabilitation **ANPT Education Center:** Core Outcome Measures: 10 Meter and 6 Minute Walk Core Outcome Measures: Berg Balance Scale Core Outcome Measures: Five Times Sit to Stand and ABC Scale Core Outcome Measures: Functional Gait Assessment Core Outcome Measures: Score Interpretation and Continuum Use

Reference:
ABPTS and the Specialty Council on Neurologic Physical Therapy. Description of Specialty Practice: Neurologic. 2016