PT Annual Exam:

Population	Why
Adults with Parkinson Disease (PD)	Parkinson Disease (PD) is a progressive neurodegenerative disorder; thus, patients living with PD experience clinical symptoms that evolve and worsen over time.[1] PD's etiology is multifactorial, and the disease affects multiple systems in the body; therefore, there is also a wide variety of clinical manifestations.[1] Motor symptoms of PD can include bradykinesia, rigidity, tremor, and postural instability; and PD can also cause disturbances in autonomic function, sleep, cognition and memory, and mood regulation.[1] As a result, those with PD may be at risk for developing secondary conditions, such as dysphagia or high rates of falls, that can cause additional injury or contribute to activity limitation.[1] Furthermore, symptoms of PD that are perceived barriers to participating in physical activity may contribute to the development of metabolic syndrome and other chronic illnesses for which inactivity and sedentary lifestyle are risk factors.[2] Over the course of a year, progression of motor and/or non-motor symptoms of PD may significantly impact patients' quality of life and ability to function in their life roles and home environment.[1,3] An annual exam tailored to PD allows Physical Therapists (PTs) to screen for the presence of new or significantly increased PD symptoms as well as other health and wellness indicators. PTs can gain a comprehensive view of the patient's overall health and PD symptoms and address impairments within the PT scope of practice that are impeding participation in positive health behaviors or health risk factors (ie: falls risk). Furthermore, the wellness exam can be used to identify signs and/or symptoms that warrant referral to another healthcare provider.[4]

Annual exam: Subjective/objective

Question/test	What testing	Positive finding	Clinical reasoning (Evidence if indicated)
Appendix A: Past Medical History (PMH) Questions Adapted from	Past Medical History	Any positive PMH items	A patient's PMH can help inform an annual wellness exam. If a patient has indicated presence of a chronic condition or illness, then follow-up questions about medical and self-management are warranted. PTs can provide educational resources and/or referrals to other healthcare providers for disease management that is outside the PT scope of practice. Furthermore, presence of medical

APTA Adult PT Checkup Template[4]			conditions can impact later testing items (ie: history of arthritis may impact musculoskeletal testing). Filling out a PMH form can also reveal “red flag” symptoms that indicate an unidentified systemic disease process may be present. This would warrant referral to the patient’s primary health care provider. It is important to know about a patient’s overall health history in order to best individualize care.
1.Who is your primary PD provider? 2.What is your current PD medication regimen? 3.What other treatments and/or surgeries have you undergone for your PD?	PD-specific PMH	Patient does not have a primary PD provider	Information about a patient’s PD management is important for understanding where they are in the course of the disease and for anticipating side effects. For example, Levodopa medications are associated with an “on-off” phenomenon throughout the day, which can greatly impact an individual’s symptoms and functioning.[5] An annual visit can also be helpful for patient education on various procedures and surgeries they may be considering, such as deep brain stimulation.[5] PD is progressive and complex and affects many body systems.[1,3] Thus, a significant finding would be that a patient does not have a primary PD provider that is tracking their medical status. If this is the case, I would refer the patient to a neurologist in their insurance network to assure medical care and guidance.
Appendix B: Stay Independent Questionnaire (SIQ)[6]	Falls risk	Score of 4 or more indicates fall risk[6] “Yes” to questions 1, 3, or 5	Between 62% and 68% of patients with PD experience falls, which are associated with progressive postural instability in PD.[1] Older age, duration of disease, and dementia are also independent risk factors for falls in PD.[1] Falls can be devastating for older adults with PD and are associated with many medical complications, including fractures and traumatic brain injury (TBI), decreased mobility, social isolation, and decreased quality of life.[1,7] The Stay Independent Questionnaire was developed as comprehensive screening tool for falls risk for older adults by the Centers for Disease Control and Prevention.[6] The measure itself also has a brief explanation for why

			each item is relevant for falls risk, which can assist with patient education.[6] If a patient feels unsteady while walking, is fearful of falling, or has fallen in the past year, then I would recommend following up in PT for a deeper falls risk assessment and course of treatment.[6] Furthermore, a significant decline in function may warrant referral to the patient's physician for alteration in medical management of PD.
1.Resting heart rate (HR), 2.Resting respiratory rate (RR), 3.Blood pressure (BP) at rest in sitting and upon standing	Vital Signs	Any value greater than the norms below:[8] HR: 60-100 BP: <120/80 RR: 12-16 Presence of orthostatic hypotension:[1] decrease of systolic BP >20mmHg or diastolic BP >10mmHg upon standing	Vital signs can reveal valuable information about a patient's overall cardiovascular health. The Guide to Physical Therapy Practice recommends that all patients who are seen for PT intervention receive a cardiopulmonary screening, including HR, RR and BP.[9] This information may uncover unidentified risk factor in older adults; for example, hypertension is a risk factor for cardiovascular disease, cancer, stroke, and diabetes.[9] With high rates of chronic diseases in the adult population, vitals screening during annual exams assist PTs with health promotion.[9] It is important to screen for orthostatic hypotension, which affects 30-40% of patients with PD.[1] Autonomic dysfunction related to PD may cause dizziness, vision alteration, impaired cognition, or loss of consciousness upon assuming upright posture.[1] Positive findings for any vital sign measure would warrant communication with the patient's physician. Positive orthostatic hypotension findings can prompt education on self-management (ie: lower extremity exercises before standing) and closer guarding during functional activity testing.

Appendix C: BMI Calculation[10]	Body Composition	BMI outside of the "Normal" range[10] Underweight: below 18.5 Normal: 18.5-24.9 Overweight: 25.0-29.9 Obese: 30.0 and above	Obesity is a risk factor for cardiovascular disease, cancer, obstructive lung disease, stroke, and diabetes, among other chronic illnesses.[9] In PD specifically, obesity is related to an increased risk of functional dependency and rapid motor progression.[11] Identification of a patient's overweight or obese status may prompt conversation about barriers to physical activity and referral to a registered dietician for weight management. Conversely, weight loss can also be a complication of common PD medications; and sarcopenia and frailty are associated with poor prognosis and risk of mortality in PD patients.[12,13] Thus, identification of underweight status may also prompt referral to registered dietician or PD specialist for nutritional counseling. .
Appendix D: Mini Nutritional Assessment (MNA)[14]	Nutrition Assessment	MNA score of <23.5 indicates "at risk of malnutrition"[14] <17 indicates malnourished[14]	Malnutrition, loss of body weight, and muscle and fat wasting are common in patients with PD.[15] These secondary conditions are associated with debility, impaired immunity, and increased risk of mortality.[15] However, early detection of malnutrition risks may decrease these consequences.[15] Nutritional status should be screened in a PD patient's annual exam to identify body weight changes, nutritional deficiencies, autonomic GI dysfunction, and other non-motor symptoms of PD or its treatments that impact feeding.[16] The MNA is a nutrition screening tool that takes into account anthropometrics, types of foods eaten per day, mobility and independence, difficulties with food intake, and more.[14] A positive result indicating malnutrition or risk of malnutrition would prompt referral to a registered dietician or PD specialist for nutritional counseling.

Appendix E: Pittsburgh Sleep Quality Index (PTQI)[17]	Sleep Dysfunction	Global PSQI score >5 out of 21 indicates "poor sleeping"[17]	The PD disease process affects anatomical structures and neurotransmitters that are involved in modulating sleep cycles.[1] Excessive daytime sleepiness occurs in up to 50% of PD patients; and this may be connected to PD medications and/or fractionated sleep.[1] In sleep studies, patients with PD awaken more frequently in the night than those without PD; and PD symptoms, such as nocturia, tremors, difficulty moving in the bed and/or depression may contribute.[1] REM Behavior Sleep Disorder may also be present in 27-32% of PD patients.[1] Sleep is linked to physical health, psychological health, and wellbeing.[9] Thus, a screen of sleep quality is warranted in an annual exam. The PSQI contains items on sleep duration, disturbances, latency, and impacts on daytime function.[17] Positive findings could prompt discussions on sleep hygiene and modifying behaviors that may improve sleep quality.[9] Specific impairments identified may also warrant referral to the patient's neurologist or a sleep specialist.
Adapted from APTA Adult PT Checkup Template:[4] What physical activities do you enjoy? What activities do you want to be able to do? How many minutes per day and days per week are	Physical Activity	Cumulative physical activity that is lower than the Physical Activity Guidelines for Americans[18]: At least 150 minutes/week of moderate intensity aerobic activity[18]	Physical inactivity is a risk factor for cardiovascular disease, cancer, stroke, diabetes, and osteoporosis.[9] However, nearly 80% of adults in the United States are not meeting the guidelines for both aerobic and muscle strengthening activity.[18] Therefore, in a wellness exam, a positive finding would prompt patient education, discussions on motivation and problem solving barriers to performing physical activity. For patients with PD, higher self-reported physical activity is associated with slower progression of motor symptoms; decreased rates of depression, anxiety, and cognitive decline; and greater independence with Activities of Daily Living (ADLs).[19] However, motor or non-motor symptoms of PD may make participation in physical activity more difficult. Positive findings on these questions may inform more in-depth PT evaluation of functional movements and strength to find ways for the patient to participate in meaningful physical activity.

you physically active? At what intensity do you engage in physical activity (mild, moderate, vigorous)?		2x/week moderate+ intensity muscle-strengthening activities[18] Patient is unable to perform activities that he/she enjoys	
Appendix F: Snellen Eye Chart[20] The patient should wear any corrective lenses/glasses they typically use for the test.	Visual Acuity Screen	Visual acuity worse than 20/40[25] (unable to read all of line 6 accurately at a distance of 10 feet with both eyes open)[20,25]	Vision is a major sensory input used for postural control and balance.[21,22] In healthy test subjects, altering or removing visual stimuli from the environment during a Sensory Organization Test decreases postural control.[22] The sensory system deteriorates as part of the aging process; thus, it is recommended that vision is checked at annual visits for older adults for falls prevention.[22-24] The PD process also significantly impacts postural stability; therefore, ensuring that visual inputs are as accurate as possible is important to prevent loss of stability.[1] The Snellen Eye Chart is a useful tool for assessing vision and identifying visual impairments in elderly patients.[25] In an annual exam, it can be used as a screen for visual acuity. Distant binocular acuity of 20/40 is required for safety with driving; positive findings would prompt referral to a vision specialist.[25]
1. Are you experiencing constipation or difficulty evacuating stools during	Bowel and/or Bladder Dysfunction	"Yes" to questions 1 or 2 1 or greater to question 3[26]	Gastrointestinal (GI) symptoms are common in PD, with up to 70-80% of patients complaining of slow-transit constipation.[1] Autonomic PD changes can impact GI motility and sphincter control, as well as urinary control disturbances.[1] Frequent nocturia is reported in up to 60% of patients, which can greatly impact sleep quality and quality of life for patients and their caregivers.[1,26] Positive findings on these

bowel movements?[1] 2. Are you experiencing increased urinary urgency, frequency, or incontinence (uncontrolled voiding)?[1] 3. How often do you wake at night to use the restroom?[26]			questions can prompt deeper questioning as well as patient education and conservative treatment within the PT scope of practice. Significant changes in function may also warrant referral to the patient's physician for management (ie: prescription of antimuscarinic medication, stool softener).[26]
Appendix G: Mini Mental State Examination (MMSE)[27]	Cognition	MMSE score < 24/30 is "abnormal"[27] 20-25/30 indicates "mild impairment"[27] 10-20/30 indicates "moderate impairment"[27] 0-10/30 indicates "severe impairment"[27]	Cognitive dysfunction and dementia is common in PD, with early symptoms including problems with executive functioning (ie: goal-directed behavior, money management).[1] Cognitive decline has also been reported as more debilitating for patients and caregivers than motor problems.[3] Mild Cognitive Impairment (MCI) can be identified in 15% of PD patients at the time of diagnosis, and those with PD are twice as likely to develop MCI compared to those without PD.[1,28] The MMSE contains items that test orientation, attention, memory, language, and visual-spatial skills.[27,29] The MMSE can be used to screen for cognitive impairment in those with PD and to track change in global cognitive state over time at subsequent annual exams.[29] Positive findings would prompt referral to the patient's neurologist for formal assessment of cognition.

Appendix H: Hospital Anxiety and Depression Scale (HADS)[30]	Depression and/or Anxiety	HADS score >11 indicates probably presence of a mood disorder[30]	The loss of dopaminergic neurons is also associated with disturbances of mood and reward systems in those with PD.[31] Clinically significant depressive disturbances occur in 40-50% of PD patients, which can negatively impact quality of life, motor and cognitive deficits, functional disability, and other psychiatric co-morbidities.[31] Patients with PD may also experience anxiety either as a a prominent feature/symptom of a depressive disorder or as a co-morbidity to PD.[31] The HADS contains 14 items and has been validated to screen for depressive/anxiety symptoms in PD patients.[30,32] With a positive finding, I would refer my patient to a clinician who treats mental health to support the patient as a whole.
Appendix I: Swallowing Disturbance Questionnaire (SDQ)[33]	Dysphagia	SDQ score > 12.5 predicts the "presence of both known and unknown swallowing disturbances"[33]	Over 80% of patients with PD develop dysphagia (difficulty swallowing) in their life, which can lead to malnutrition, difficult medication administration, and aspiration pneumonia, which is a frequent cause of death in PD.[34] Thus, I would be sure to screen for swallowing difficulties for patient safety. The SDQ is a 15-item questionnaire that was designed and validated to detect swallowing problems in patients with PD; and it includes difficulties with chewing, swallowing, drooling, breathing, and coughing with meals and drinks.[33,34] Identification of dysphagia would prompt referral for an in-depth swallowing evaluation.
1.Are you experiencing difficulty producing speech at your regular volume?[35] 2.Are those around you	Dysarthria	"Yes" to either question	Between 70 and 79% of individuals with PD report impaired speech and functional communication.[35] These questions serve as a quick screen which indicates difficulty with communication, which can contribute to social isolation and impact quality of life.[35] Positive findings on these questions would prompt referral to a Speech Language Pathologist and/or a PD-specific program, such as LSVT Loud, for speech therapy.[36]

having difficulty understanding you when you speak?[35]			
5 Times Sit-to-Stand (5xSTS) Timed Up and Go (TUG)	Functional Strength and Mobility	5xSTS score >16.0 seconds indicates fall risk in those with PD.[37] TUG score > 12.0 seconds indicates risk of falling[38]	The 5xSTS measures functional lower extremity strength and allows observation of what movement strategies a patient uses to complete transfers.[37] The TUG includes sit<>stand transfers, ambulation, and turning; and it can be used to assess mobility, balance, walking ability, and falls risk.[38] Functional strength and mobility are necessary for safe home and community navigation, independence with ADLs, and participation in social and leisure activities. Motor symptoms of PD, such as bradykinesia, difficulty initiating movements, muscular rigidity, and postural instability can all affect functional mobility.[1] Positive findings on these tests would prompt a more in-depth PT evaluation and increased delivery of PT services to address functional limitations.
1.Observation of ambulation upon entering the clinic and during functional mobility tests (above) 2.How often do you experience “freezing” episodes or “feeling like	Gait Assessment	Presence of freezing, stumbles, loss of balance	In PD, expected gait changes include decreased gait speed, step length, push-off, clearance, trunk and pelvic rotation, reciprocal arm swing.[39,40] However, the presence of freezing, stumbling, and loss of balance during gait pose a greater risk for patient falls risk and safety.[1] 25-60% of patients with PD experience freezing of movements, which typically emerges multiple years after PD onset.[1] Positive findings during gait assessment would prompt deeper PT evaluation of freezing and dynamic stability during gait. Furthermore, a significant decline in function may warrant prescription of an assistive device and/or referral to the patient’s physician for alteration in medical management of PD.

your foot is glued to the floor" while walking?[39]			
MiniBEST test[41]	Dynamic Balance	Total score of 16/28 or higher indicates risk of falls in older adults[41]	Postural instability is a particularly debilitating motor symptom of PD because it can lead to fall-related injuries (ie: fracture, TBI) as well as decreased activity and social isolation from fear of falling.[7] The MiniBEST test has been found to have higher predictive accuracy of falls in older adults and in the PD population than other balance measures, such as the Berg Balance Scale.[41,42] The MiniBEST also has clinical utility because it assess many aspects of balance, including anticipatory and reactive postural control, sensory organization, and dynamic gait.[41] This makes it appropriate for PD, which has complex, multidimensional causes and consequences.[42] A positive result would indicate need for balance training, and performance on individual items may inform future PT interventions on specific areas of need. Some items of the miniBEST can also be observed during functional mobility testing (above), which increases time-effectiveness.
1.9 Hole Peg Test (HPT)[43] 2.Do tremors impact your ability to perform daily activities such as eating or changing clothes?	Hand Functioning	Significantly increased time to complete task compared to age and gender-matched peers (Appendix J)[44] "Yes" to 2 or 3	Approximately 80% of PD patients report limb tremor, most commonly resting pill-rolling tremor of the hands.[1] Bradykinesia can also impact handwriting and the ability to perform ADLs and other tasks requiring dexterity[1] Thus, screening for hand function is relevant in an annual exam for those with PD. The 9 HPT tests coordination and dexterity and it is recommended for assessment of upper extremity function in PD patients.[43] Positive findings may prompt referral to a hand specialist in PT or Occupational Therapy for functional activities training. Communication of positive findings with the patient's PD physician is also appropriate and may contribute to alteration in medical management of PD.

3. Do tremors impact your ability to participate in hobbies or leisure activities?			

Resources/referrals:

Test item	Resource/referral	Reasoning
Swallowing Disturbance Questionnaire (SDQ)[33]	Speech and Language Pathologist (SLP)	Dysphagia, or difficulty swallowing, may manifest as a result of muscle rigidity, bradykinesia, and autonomic dysfunction in patients with PD.[1] A positive finding on the SDQ predicts the presence of swallowing dysfunction, which can include difficulty swallowing liquids or solid foods, coughing or difficulty breathing with intake, involuntary drooling, and/or food or drinking coming out of the nose/mouth during swallowing.[33] These symptoms can greatly impact a patient's desire to participate in social activities as well as their ability to safely nourish themselves. Dysphagia is a contributor to PD-related malnutrition and aspiration pneumonia; both of which are poor prognostic indicators for long-term health.[15,34] SLPs have expertise in swallowing dysfunction and can perform a comprehensive swallowing examination to diagnose a specific swallowing disorder and determine the safest route of nutrition and hydration intake.[45] SLPs can also provide rehabilitative interventions to improve swallowing function and/or recommend compensatory methods of treating dysphagia.[46] This referral is a priority because it can directly impact a patient's medical stability as well as their quality of life.
Hospital Anxiety and Depression	Psychiatrist (with experience treating PD patients)	Untreated depression is associated with greater functional disability, faster physical and cognitive decline, poorer quality of life, increased caregiver distress and increased mortality for those with PD.[31] Anxiety and depression are also generally referred to as "yellow flags," which are negative prognostic

Scale (HADS)[30]		indicators for progress in physical therapy courses of treatment. A positive finding on the HADS screen would prompt a referral for mental health intervention to promote PD patients' health and wellbeing. A psychiatrist can be an appropriate mental health professional for those with PD because depression can result from the neurobiological course of PD.[31] Improvements in depression symptoms in PD patients have been produced by antidepressant medication (ie: SSRIs), cognitive behavioral therapy, and dopamine-replacing medications in various randomized control trials studies.[47] Thus, a psychiatrist has access to multiple medication and nonmedication interventions that may be useful for patients with PD. Psychiatrists are also equipped to address anxiety and other psychiatric issues that may evolve in those with PD, such as psychosis (ie: hallucinations), sleep disorders, impulse-control disorders.[47] Thus, referral to a psychiatrist with experience treating those with PD may help address currently identified mood disorders and also help identify and address future mental health needs throughout the course of PD.
Mini Nutritional Assessment (MNA)[14]	Registered Dietician (RD)	Malnutrition can develop in PD patients as a result of the interaction of multiple motor and non-motor symptoms, such as decreased hand dexterity and function, constipation, dysphagia, and depression.[1,16] Lack of nutrition is also associated with muscle wasting, frailty, and increased risk of mortality in those with PD.[15] The MNA can identify those who are at risk of malnutrition even before they exhibit weight loss.[14] If a patient is at risk of malnutrition, then referral to a registered dietician is appropriate for full nutritional assessment. RDs can address unintentional weight loss and nutritional deficiencies through individualized diet recommendations.[48] Furthermore, RDs can prescribe nutritional supplements that are associated with reduced PD progression as well as educate patients about optimal timing of meals and medications to ensure medication effectiveness.[16,49] Thus, referral to a RD for nutritional counseling can have a significant impact on the health and wellness of those with PD,

Bibliography:

1. Sveinbjornsdottir S. The clinical symptoms of Parkinson's disease. *J Neurochem*. 2016;139 Suppl 1:318-324. doi:10.1111/jnc.13691
2. LaHue SC, Comella CL, Tanner CM. The best medicine? The influence of physical activity and inactivity on Parkinson's disease. *Mov Disord*. 2016;31(10):1444-1454. doi:10.1002/mds.26728
3. Barone P, Erro R, Picillo M. Quality of life and nonmotor symptoms in parkinson's disease. *Int Rev Neurobiol*. 2017;133:499-516. doi:10.1016/bs.irn.2017.05.023
4. American Physical Therapy Association. Annual Physical Therapy Visit: Adult Population. https://www.apta.org/patient-care/interventions/annual-checkup. Published August 3, 2020. Accessed September 14, 2020.
5. Mercer V. Basal Ganglia Disorders. Presented at the: Neuromuscular Intervention II; February 17, 2020; University of North Carolina at Chapel Hill Division of Physical Therapy.
6. Centers for Disease Control and Prevention. Stay Independent Questionnaire. https://www.cdc.gov/steadi/pdf/STEADI-Brochure-StayIndependent-508.pdf. Accessed September 14, 2020.
7. Crouse JJ, Phillips JR, Jahanshahi M, Moustafa AA. Postural instability and falls in Parkinson's disease. *Rev Neurosci*. 2016;27(5):549-555. doi:10.1515/revneuro-2016-0002
8. Johns Hopkins Medicine. Vital Signs (BodyTemperature, Pulse Rate, Respiration Rate, Blood Pressure) . https://www.hopkinsmedicine.org/health/conditions-and-diseases/vital-signs-body-temperature-pulse-rate-respiration-rate-blood-pressure. Accessed September 14, 2020.
9. Dean E. Physical therapy in the 21st century (Part I): toward practice informed by epidemiology and the crisis of lifestyle conditions. *Physiother Theory Pract*. 2009;25(5-6):330-353. doi:10.1080/09593980802668027
10. Centers for Disease Control and Prevention. About Adult BMI. https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html. Accessed September 14, 2020.
11. Kim R, Jun J-S. Impact of overweight and obesity on functional and clinical outcomes of early parkinson's disease. *J Am Med Dir Assoc*. 2020;21(5):697-700. doi:10.1016/j.jamda.2019.11.019
12. Fabbri M, Zibetti M, Beccaria L, et al. Levodopa/carbidopa intestinal gel infusion and weight loss in Parkinson's disease. *Eur J Neurol*. 2019;26(3):490-496. doi:10.1111/ene.13844
13. Kamijo Y, Kanda E, Ishibashi Y, Yoshida M. Sarcopenia and frailty in PD: impact on mortality, malnutrition, and inflammation. *Perit Dial Int*. 2018;38(6):447-454. doi:10.3747/pdi.2017.00271
14. Vellas B, Guigoz Y, Garry PJ, et al. The Mini Nutritional Assessment (MNA) and its use in grading the nutritional state of elderly patients. *Nutrition*. 1999;15(2):116-122. doi:10.1016/S0899-9007(98)00171-3

15. Shidfar F, Babaii Darabkhani P, Yazdanpanah L, Karkheiran S, Noorollahi-Moghaddam H, Haghani H. Assessment of nutritional status in patients with Parkinson's disease and its relationship with severity of the disease. *Med J Islam Repub Iran*. 2016;30:454.
16. Barichella M, Cereda E, Pezzoli G. Major nutritional issues in the management of Parkinson's disease. *Mov Disord*. 2009;24(13):1881-1892. doi:10.1002/mds.22705
17. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Res.* 1989;28(2):193-213. Doi:10.1016/0165-1781(89)90047-4
18. U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: U.S. Department of Health and Human Services; 2018.
19. Amara AW, Chahine L, Seedorff N, et al. Self-reported physical activity levels and clinical progression in early Parkinson's disease. *Parkinsonism Relat Disord*. 2019;61:118-125. doi:10.1016/j.parkreldis.2018.11.006
20. Vision Source Eye Chart. https://visionsource.com/site/assets/files/1192/vision_source_eye_chart.pdf. Accessed September 14, 2020.
21. Peterka RJ. Sensory integration for human balance control. In: *Balance, Gait, and Falls*. Vol 159. Handbook of clinical neurology. Elsevier; 2018:27-42. doi:10.1016/B978-0-444-63916-5.00002-1
22. Mercer V. Balance Assessment and Intervention. Presented at the: Neuromuscular Intervention I; October 21, 2019; The University of North Carolina at Chapel Hill Division of Physical Therapy.
23. Pelletier AL, Rojas-Roldan L, Coffin J. Vision loss in older adults. *Am Fam Physician*. 2016;94(3):219-226.
24. Cohen HS, Stitz J, Sangi-Haghpeykar H, Williams SP. Vision screening in adults across the life span. *South Med J*. 2018;111(2):109-112. doi:10.14423/SMJ.0000000000000762
25. Kalinowski MA. "Eye" dentifying vision impairment in the geriatric patient. *Geriatr Nurs*. 2008;29(2):125-132. doi:10.1016/j.gerinurse.2007.07.001
26. Batla A, Phé V, De Min L, Panicker JN. Nocturia in parkinson's disease: why does it occur and how to manage? *Mov Disord Clin Pract*. 2016;3(5):443-451. doi:10.1002/mdc3.12374
27. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res*. 1975;12(3):189-198. doi:10.1016/0022-3956(75)90026-6
28. Aarsland D. Cognitive impairment in Parkinson's disease and dementia with Lewy bodies. *Parkinsonism Relat Disord*. 2016;22 Suppl 1:S144-8. doi:10.1016/j.parkreldis.2015.09.034
29. Roheger M, Kalbe E, Liepelt-Scarfone I. Progression of cognitive decline in parkinson's disease. *J Parkinsons Dis*. 2018;8(2):183-193. doi:10.3233/JPD-181306
30. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67(6):361-370. doi:10.1111/j.1600-0447.1983.tb09716.x

31. Marsh L. Depression and Parkinson's disease: current knowledge. *Curr Neurol Neurosci Rep*. 2013;13(12):409. doi:10.1007/s11910-013-0409-5
32. Rodriguez-Blazquez C, Frades-Payo B, Forjaz MJ, de Pedro-Cuesta J, Martinez-Martin P, Longitudinal Parkinson's Disease Patient Study Group. Psychometric attributes of the Hospital Anxiety and Depression Scale in Parkinson's disease. *Mov Disord*. 2009;24(4):519-525. doi:10.1002/mds.22321
33. Cohen JT, Manor Y. Swallowing disturbance questionnaire for detecting dysphagia. *Laryngoscope*. 2011;121(7):1383-1387. doi:10.1002/lary.21839
34. Suttrup I, Warnecke T. [dysphagia in parkinson's disease: pathophysiology, diagnosis and therapy]. *Fortschr Neurol Psychiatr*. 2016;84 Suppl 1:S18-23. doi:10.1055/s-0042-107245
35. Pinto S, Cardoso R, Sadat J, et al. Dysarthria in individuals with Parkinson's disease: a protocol for a binational, cross-sectional, case-controlled study in French and European Portuguese (FraLusoPark). *BMJ Open*. 2016;6(11):e012885. doi:10.1136/bmjopen-2016-012885
36. Fox C, Ebersbach G, Ramig L, Sapir S. LSVT LOUD and LSVT BIG: behavioral treatment programs for speech and body movement in parkinson disease. *Parkinsons Dis*. 2012;2012:391946. doi:10.1155/2012/391946
37. Duncan RP, Leddy AL, Earhart GM. Five times sit-to-stand test performance in Parkinson's disease. *Arch Phys Med Rehabil*. 2011;92(9):1431-1436. doi:10.1016/j.apmr.2011.04.008
38. Makizako H, Shimada H, Doi T, et al. Predictive Cutoff Values of the Five-Times Sit-to-Stand Test and the Timed "Up & Go" Test for Disability Incidence in Older People Dwelling in the Community. *Phys Ther*. 2017;97(4):417-424. doi:10.2522/ptj.20150665
39. Mercer V. Basal Ganglia Disorders. Presented at the: Neuromuscular Intervention II; February 17, 2020; University of North Carolina at Chapel Hill Division of Physical Therapy.
40. Mirelman A, Bonato P, Camicioli R, et al. Gait impairments in Parkinson's disease. *Lancet Neurol*. 2019;18(7):697-708. doi:10.1016/S1474-4422(19)30044-4
41. Yingyongyudha A, Saengsirisuwan V, Panichaporn W, Boonsinsukh R. The Mini-Balance Evaluation Systems Test (Mini-BESTest) Demonstrates Higher Accuracy in Identifying Older Adult Participants With History of Falls Than Do the BESTest, Berg Balance Scale, or Timed Up and Go Test. *J Geriatr Phys Ther*. 2016;39(2):64-70. doi:10.1519/JPT.0000000000000050
42. Lopes LKR, Scianni AA, Lima LO, Lana R de C, Rodrigues-De-Paula F. The Mini-BESTest is an independent predictor of falls in Parkinson Disease. *Braz J Phys Ther*. July 2019. doi:10.1016/j.bjpt.2019.07.006

43. Earhart GM, Cavanaugh JT, Ellis T, Ford MP, Foreman KB, Dibble L. The 9-hole PEG test of upper extremity function: average values, test-retest reliability, and factors contributing to performance in people with Parkinson disease. *J Neurol Phys Ther*. 2011;35(4):157-163. doi:10.1097/NPT.0b013e318235da08
44. Mathiowetz V. Adult Norms for the Nine Hole Peg Test of Finger Dexterity . *The Occupational Therapy Journal of Research*. 1985;5(1):30-31.
45. American Speech-Language-Hearing Association. Adult Dysphagia . https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589942550&section=Assessment#Assessment. Accessed September 14, 2020.
46. Smith SK, Roddam H, Sheldrick H. Rehabilitation or compensation: time for a fresh perspective on speech and language therapy for dysphagia and Parkinson's disease? *Int J Lang Commun Disord*. 2012;47(4):351-364. doi:10.1111/j.1460-6984.2011.00093.x
47. Grover S, Somaiya M, Kumar S, Avasthi A. Psychiatric aspects of Parkinson's disease. *J Neurosci Rural Pract*. 2015;6(1):65-76. doi:10.4103/0976-3147.143197
48. Michael J. Fox Foundation. How a Dietitian Can Help with Parkinson's. https://www.michaeljfox.org/news/ask-md-how-dietitian-can-help-parkinsons. Published January 30, 2020. Accessed September 14, 2020.
49. Mischley LK, Lau RC, Bennett RD. Role of diet and nutritional supplements in parkinson's disease progression. *Oxid Med Cell Longev*. 2017;2017:6405278. doi:10.1155/2017/6405278

Appendices:

Appendix A: Past Medical History (PMH) Questions Adapted from APTA Adult PT Checkup Template[4]

Medical and Surgical History, Including Current Prescription Medications:
Collect information specifically regarding individual's medical and surgical history.

- ☐ Allergies
  - ☐ Seasonal
  - ☐ Other Click here to enter.
- ☐ Arthritis
- ☐ Asthma or other lung disease
- ☐ Blood disorder
- ☐ Bone fractures (include locations) Click here to enter.
- ☐ Cancer (include type) Click here to enter.
- ☐ Circulation, vascular problems (including burning or cramping sensation in lower legs when walking short distances)
- ☐ Depression
- ☐ Diabetes or high blood sugar
- ☐ Head injury
- ☐ Heart problems (including heart attack, heart surgery, cardiac catheterization, angioplasty, pacemaker/implantable defibrillator, rhythm disturbance, heart valve disease, heart failure, heart transplant, congenital heart disease)
- ☐ High cholesterol
- ☐ Hypertension
- ☐ Hypoglycemia or low blood sugar
- ☐ Infectious disease (e.g., tuberculosis, hepatitis)
- ☐ Kidney problems
- ☐ Lung problems (including chronic obstructive pulmonary disease)
- ☐ Major surgery
  Type: Click here to enter.
  Month/Year: Click here to enter.
  Type: Click here to enter.
  Month/Year: Click here to enter.
  Type: Click here to enter.
  Month/Year: Click here to enter.
- ☐ Multiple sclerosis
- ☐ Muscular dystrophy
- ☐ Musculoskeletal problems (list) Click here to enter.
- ☐ Osteoporosis
- ☐ Parkinson disease
- ☐ Repeated infections
- ☐ Seizures, epilepsy
- ☐ Skin diseases or open wounds
- ☐ Stroke
- ☐ Thyroid problems
- ☐ Ulcers, stomach problems

Medical and Surgical History, Including Current Prescription Medications:
Collect information specifically regarding individual's medical history within the past year.

- ☐ Bowel problems (e.g., constipation, leakage of gas or stool, irritable bowel syndrome)
- ☐ Chest pain or chest discomfort with exertion
- ☐ Chronic cough
- ☐ Coordination problems
- ☐ Dizziness, fainting, or blackouts
- ☐ Difficulty sleeping
- ☐ Difficulty swallowing
- ☐ Fever, chills, or sweats
- ☐ Heart palpitations
- ☐ Headaches
- ☐ Hernias
- ☐ Hoarseness
- ☐ Loss of appetite
- ☐ Loss of balance
- ☐ Nausea/vomiting
- ☐ Pain that wakes individual at night
- ☐ Pain with sexual activity
- ☐ Pelvic or abdominal bloating or pain
- ☐ Restrictions from scars
- ☐ Shortness of breath
- ☐ Urinary problems (e.g., difficulty emptying, leakage during cough or sneeze, leakage with urgency, leakage while exercising, painful urination, urinary urgency, frequency >12 times per day, frequency >2 times per night)
- ☐ Weakness or swelling in arms or legs
- ☐ Weight loss or gain

Appendix B: Stay Independent Questionnaire[6]

STAY INDEPENDENT QUESTIONNAIRE

Centers for Disease Control and Prevention

National Center for Injury Prevention and Control

This test was produced in collaboration with the VA Greater Los Angeles Healthcare System, Geriatric Research Education & Clinical Center (GRECC), and the Fall Prevention Center of Excellence

Patient Name:
Date:

PLEASE CHECK OFF "YES" OR "NO" FOR EACH STATEMENT BELOW			WHY IT MATTERS
YES	NO		
☐	☐	I have fallen in the past year	People who have fallen once are likely to fall again.
☐	☐	I use or have been advised to use a cane or walker to get around safely	People who have been advised to use a cane or walker may already be more likely to fall.
☐	☐	Sometimes I feel unsteady when I am walking	Unsteadiness or needing support while walking are signs of poor balance
☐	☐	I steady myself by holding onto furniture when walking at home	This is also a sign of poor balance
☐	☐	I am worried about falling	People who are worried about falling are more likely to fall
☐	☐	I need to push with my hands to stand up from a chair	This is a sign of weak leg muscles, a major reason for falling
☐	☐	I have some trouble stepping up onto a curb	This is also a sign of weak leg muscles
☐	☐	I often have to rush to the toilet	Rushing to the bathroom, especially at night, increases your chance of falling
☐	☐	I have lost some feeling in my feet	Numbness in your feet can cause stumbles and lead to falls
☐	☐	I take medicine that sometimes makes me feel light-headed or more tired than usual	Side effects from medicines can sometimes increase your chance of falling
☐	☐	I take medicine to help me sleep or improve my mood	These medicines can sometimes increase your chance of falling
☐	☐	I often feel sad or depressed	Symptoms of depression, such as not feeling well or feeling slowed down, are linked to falls

YOUR SCORE: 0

< 4 :	Minimal or No Risk of Falling
4 – 8 :	Moderate to High Risk of Falling
> 8 :	High to Severe Risk of Falling

Appendix C: BMI Calculation[10]

Measurement Units	Formula and Calculation
Kilograms and meters (or centimeters)	Formula: weight (kg) / [height (m)]^2 With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Because height is commonly measured in centimeters, divide height in centimeters by 100 to obtain height in meters. Example: Weight = 68 kg, Height = 165 cm (1.65 m) Calculation: 68 ÷ $(1.65)^2$ = 24.98
Pounds and inches	Formula: weight (lb) / [height (in)]^2 x 703 Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of 703. Example: Weight = 150 lbs, Height = 5’5” (65”) Calculation: [150 ÷ $(65)^2$] x 703 = 24.96

Appendix D: Mini Nutritional Assessment (MNA)[14]

MINI NUTRITIONAL ASSESSMENT
MNA®

ID# _____

Last Name: _____ First Name: _____ M.I. _____ Sex: _____ Date: _____

Age: _____ Weight, kg: _____ Height, cm: _____ Knee Height, cm: _____

Complete the form by writing the numbers in the boxes. Add the numbers in the boxes and compare the total assessment to the Malnutrition Indicator Score.

ANTHROPOMETRIC ASSESSMENT

	Points
1. Body Mass Index (BMI) (weight in kg) / (height in m)^2 a. BMI < 19 = 0 points b. BMI 19 to < 21 = 1 point c. BMI 21 to < 23 = 2 points d. BMI ≥ 23 = 3 points	☐
2. Mid-arm circumference (MAC) in cm a. MAC < 21 = 0.0 points b. MAC 21 ≤ 22 = 0.5 points c. MAC > 22 = 1.0 points	☐.☐
3. Calf circumference (CC) in cm a. CC < 31 = 0 points b. CC ≥ 31 = 1 point	☐
4. Weight loss during last 3 months a. weight loss greater than 3kg (6.6 lbs) = 0 points b. does not know = 1 point c. weight loss between 1 and 3 kg (2.2 and 6.6 lbs) = 2 points d. no weight loss = 3 points	☐

GENERAL ASSESSMENT

5. Lives independently (not in a nursing home or hospital) a. no = 0 points b. yes = 1 point	☐
6. Takes more than 3 prescription drugs per day a. yes = 0 points b. no = 1 point	☐
7. Has suffered psychological stress or acute disease in the past 3 months a. yes = 0 points b. no = 2 points	☐
8. Mobility a. bed or chair bound = 0 points b. able to get out of bed/chair but does not go out = 1 point c. goes out = 2 points	☐
9. Neuropsychological problems a. severe dementia or depression = 0 points b. mild dementia = 1 point c. no psychological problems = 2 points	☐
10. Pressure sores or skin ulcers a. yes = 0 points b. no = 1 point	☐

DIETARY ASSESSMENT

11. How many full meals does the patient eat daily? a. 1 meal = 0 points b. 2 meals = 1 point c. 3 meals = 2 points	☐

	Points
12. Selected consumption markers for protein intake • At least one serving of dairy products (milk, cheese, yogurt) per day? yes ☐ no ☐ • Two or more servings of legumes or eggs per week? yes ☐ no ☐ • Meat, fish or poultry every day? yes ☐ no ☐ a. if 0 or 1 yes = 0.0 points b. if 2 yes = 0.5 points c. if 3 yes = 1.0 points	☐.☐
13. Consumes two or more servings of fruits or vegetables per day? a. no = 0 points b. yes = 1 point	☐
14. Has food intake declined over the past three months due to loss of appetite, digestive problems, chewing or swallowing difficulties? a. severe loss of appetite = 0 points b. moderate loss of appetite = 1 point c. no loss of appetite = 2 points	☐
15. How much fluid (water, juice, coffee, tea, milk,...) is consumed per day? (1 cup = 8 oz.) a. less than 3 cups = 0.0 points b. 3 to 5 cups = 0.5 points c. more than 5 cups = 1.0 points	☐.☐
16. Mode of feeding a. Unable to eat without assistance = 0 points b. self-fed with some difficulty = 1 point c. self-fed without any problem = 2 points	☐

SELF ASSESSMENT

17. Do they view themselves as having nutritional problems? a. major malnutrition = 0 points b. does not know or moderate malnutrition = 1 point c. no nutritional problem = 2 points	☐
18. In comparison with other people of the same age, how do they consider their health status? a. not as good = 0.0 points b. does not know = 0.5 points c. as good = 1.0 points d. better = 2.0 points	☐.☐

ASSESSMENT TOTAL (max. 30 points): ☐☐.☐

MALNUTRITION INDICATOR SCORE		
≥ 24 points	well-nourished	☐
17 to 23.5 points	at risk of malnutrition	☐
< 17 points	malnourished	☐

Ref.: Guigoz Y, Vellas B and Garry P.J. 1994. Mini Nutritional Assessment: A practical assessment tool for grading the nutritional state of elderly patients. *Facts and Research in Gerontology.* Supplement #2: 15-59.

Appendix E: Pittsburgh Sleep Quality Index (PSQI)[17]

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

INSTRUCTIONS: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, when have you usually gone to bed at night?
   USUAL BED TIME _____
2. During the past month, how long (in minutes) has it usually take you to fall asleep each night?
   NUMBER OF MINUTES _____
3. During the past month, when have you usually gotten up in the morning?
   USUAL GETTING UP TIME _____
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)
   HOURS OF SLEEP PER NIGHT _____

INSTRUCTIONS: For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...cannot get to sleep within 30 minutes	☐	☐	☐	☐
(b) ...wake up in the middle of the night or early morning	☐	☐	☐	☐
(c) ...have to get up to use the bathroom	☐	☐	☐	☐
(d ...cannot breathe comfortably	☐	☐	☐	☐
(e) ...cough or snore loudly	☐	☐	☐	☐
(f) ...feel too cold	☐	☐	☐	☐
(g) ...feel too hot	☐	☐	☐	☐
(h) ...had bad dreams	☐	☐	☐	☐
(i) ...have pain	☐	☐	☐	☐
(j) Other reason(s), please describe _____				
How often during the past month have you had trouble sleeping because of this?	☐	☐	☐	☐

PSQI Page 1

	Very good	Fairly good	Fairly bad	very bad
6. During the past month, how would you rate your sleep quality overall?	☐	☐	☐	☐

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
7. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?	☐	☐	☐	☐
8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?	☐	☐	☐	☐

	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

	No bed partner or roommate	Partner/ roommate in other room	Partner in same room, but not same bed	Partner in same bed
10. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

If you have a roommate or bed partner, ask him/her how often in the past month you have had...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...loud snoring	☐	☐	☐	☐
(b) ...long pauses between breaths while asleep	☐	☐	☐	☐
(c) ...legs twitching or jerking while you sleep	☐	☐	☐	☐
(d) ...episodes of disorientation or confusion during sleep	☐	☐	☐	☐
(e) Other restlessness while you sleep; please describe _____	☐	☐	☐	☐

PSQI Page 2

SCORING INSTRUCTIONS FOR THE PITTSBURGH SLEEP QUALITY INDEX:

The Pittsburgh Sleep Quality Index (PSQI) contains 19 self-rated questions and 5 questions rated by the bed partner or roommate (if one is available). Only self-rated questions are included in the scoring. The 19 self-rated items are combined to form seven "component" scores, each of which has a range of 0-3 points. In all cases, a score of "0" indicates no difficulty, while a score of "3" indicates severe difficulty. The seven component scores are then added to yield one "global" score, with a range of 0-21 points, "0" indicating no difficulty and "21 " indicating severe difficulties in all areas.

Scoring proceeds as follows:

Component 1: Subjective sleep quality

Examine question #6, and assign scores as follows:

Response	Component 1 score
"Very good"	0
"Fairly good"	1
"Fairly bad"	2
"Very bad"	3

*Component 1 score:*_____

Component 2: Sleep latency

1. Examine question #2, and assign scores as follows:

Response	Score
≤15 minutes	0
16-30 minutes	1
31-60 minutes	2
> 60 minutes	3

Question #2 score: _____

2. Examine question #5a, and assign scores as follows:

Response	Score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

Question #5a score: _____

3. Add #2 score and #5a score

Sum of #2 and #5a: _____

4. Assign component 2 score as follows:

Sum of #2 and #5a	Component 2 score
0	0
1-2	1
3-4	2
5-6	3

*Component 2 score:*_____

PSQI Page 3

Component 3: Sleep duration

Examine question #4, and assign scores as follows:

Response	Component 3 score
> 7 hours	0
6-7 hours	1
5-6 hours	2
< 5 hours	3

*Component 3 score:*_____

Component 4: Habitual sleep efficiency

1. Write the number of hours slept (question #4) here:_____
2. Calculate the number of hours spent in bed:

   Getting up time (question #3):_____

   Bedtime (question #1):_____

   _____

   *Number of hours spent in bed:*_____

3. Calculate habitual sleep efficiency as follows:

   (Number of hours slept/Number of hours spent in bed) X 100 = Habitual sleep efficiency (%)

   (_____/_____) X 100 = %

4. Assign component 4 score as follows:

Habitual sleep efficiency %	Component 4 score
> 85%	0
75-84%	1
65-74%	2
< 65%	3

*Component 4 score:*_____

PSQI Page 4

Component 5: Step disturbances

1. Examine questions #5b-5j, and assign scores for each question as follows:

Response	Score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

5b score: _____
5c score: _____
5d score: _____
5e score: _____
5f score: _____
5g score: _____
5h score: _____
5i score: _____
5j score: _____

2. Add the scores for questions #5b-5j:

Sum of #5b-5j: _____

3. Assign component 5 score as follows:

Sum of #5b-5j	Component 5 score
0	0
1-9	1
10-18-4	2
19-27	3

Component 5 score: _____

Component 6: Use of sleeping medication

Examine question #7 and assign scores as follows:

Response	Component 6 score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

Component 6 score: _____

PSQI Page 5

Component 7: Daytime dysfunction

1. Examine question #8, and assign scores as follows:

Response	Score
Never	0
Once or twice	1
Once or twice each week	2
Three or more times each week	3

Question#8 score: _____

2. Examine question #9, and assign scores as follows:

Response	Score
No problem at all	0
Only a very slight problem	1
Somewhat of a problem	2
A very big problem	3

Question #9 score: _____

3. Add the scores for question #8 and #9:

Sum of #8 and #9: _____

4. Assign component 7 score as follows:

Sum of #8 and #9	Component 7 score
0	0
1-2	1
3-4	2
5-6	3

Component 7 score: _____

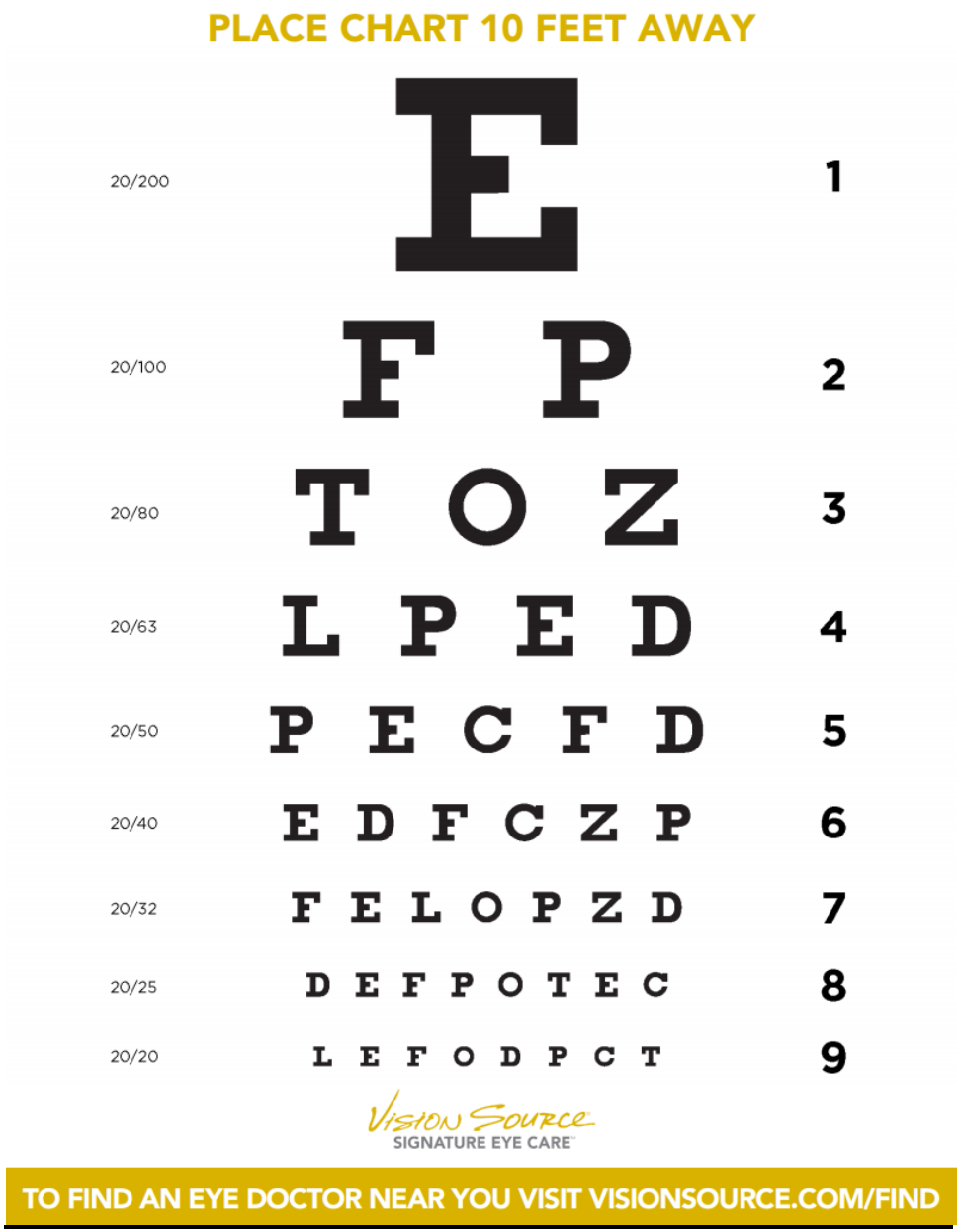
Global PSQI Score

Add the seven component scores together:

Global PSQI Score: _____

PSQI Page 6

Appendix F: Snellen Eye Chart[20]


PLACE CHART 10 FEET AWAY
20/200
E
1
20/100
F P
2
20/80
T O Z
3
20/63
L P E D
4
20/50
P E C F D
5
20/40
E D F C Z P
6
20/32
F E L O P Z D
7
20/25
D E F P O T E C
8
20/20
L E F O D P C T
9
Vision Source
SIGNATURE EYE CARE
TO FIND AN EYE DOCTOR NEAR YOU VISIT VISIONSOURCE.COM/FIND

Appendix G: Mini Mental State Examination (MMSE)[27]

Mini-Mental State Examination (MMSE)

Patient's Name: _____ Date: _____

Instructions: Score one point for each correct response within each question or activity.

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day? Month?"
5		"Where are we now? State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then the instructor asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible.
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, ...) Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.) 
30		TOTAL

Interpretation of the MMSE:

Method	Score	Interpretation
Single Cutoff	<24	Abnormal
Range	<21	Increased odds of dementia
	>25	Decreased odds of dementia
Education	21	Abnormal for 8th grade education
	<23	Abnormal for high school education
	<24	Abnormal for college education
Severity	24-30	No cognitive impairment
	18-23	Mild cognitive impairment
	0-17	Severe cognitive impairment

Interpretation of MMSE Scores:

Score	Degree of Impairment	Formal Psychometric Assessment	Day-to-Day Functioning
25-30	Questionably significant	If clinical signs of cognitive impairment are present, formal assessment of cognition may be valuable.	May have clinically significant but mild deficits. Likely to affect only most demanding activities of daily living.
20-25	Mild	Formal assessment may be helpful to better determine pattern and extent of deficits.	Significant effect. May require some supervision, support and assistance.
10-20	Moderate	Formal assessment may be helpful if there are specific clinical indications.	Clear impairment. May require 24-hour supervision.
0-10	Severe	Patient not likely to be testable.	Marked impairment. Likely to require 24-hour supervision and assistance with ADL.

Source:

- Folstein MF, Folstein SE, McHugh PR: "Mini-mental state: A practical method for grading the cognitive state of patients for the clinician." *J Psychiatr Res* 1975;12:189-198.

Appendix H: Hospital Anxiety and Depression Scale (HADS)[30]

Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.
Don't take too long over you replies: your immediate is best.

D	A		D	A	
		I feel tense or 'wound up':			**I feel as if I am slowed down:**
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			**I get a sort of frightened feeling like 'butterflies' in the stomach:**
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
		I get a sort of frightened feeling as if something awful is about to happen:			**I have lost interest in my appearance:**
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			**I feel restless as I have to be on the move:**
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		Worrying thoughts go through my mind:			**I look forward with enjoyment to things:**
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		I feel cheerful:			**I get sudden feelings of panic:**
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		I can sit at ease and feel relaxed:			**I can enjoy a good book or radio or TV program:**
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not Often	2		Not often
	3	Not at all	3		Very seldom

Please check you have answered all the questions

Scoring:
Total score: Depression (D) _____ Anxiety (A) _____
0-7 = Normal
8-10 = Borderline abnormal (borderline case)
11-21 = Abnormal (case)

Appendix I: Swallowing Disturbances Questionnaire (SDQ)[33]

TABLE I.
Swallowing Disturbances Questionnaire (SDQ).

	Question	0 Never	1 Seldom (once a month or less)	2 Frequently (1–7 times a week)	3 Very frequently (>7 times a week)
1.	Do you experience difficulty chewing solid food, like an apple, cookie or a cracker?				
2.	Are there any food residues in your mouth, cheeks, under your tongue or stuck to your palate after swallowing?				
3.	Does food or liquid come out of your nose when you eat or drink?				
4.	Does chewed-up food dribble from your mouth?				
5.	Do you feel you have too much saliva in your mouth; do you drool or have difficulty swallowing your saliva?				
6.	Do you need to swallow chewed-up food several times before it goes down your throat?				
7.	Do you experience difficulty in swallowing solid food (i.e., do apples or crackers get stuck in your throat)?				
8.	Do you experience difficulty in swallowing pureed food?				
9.	While eating, do you feel as if a lump of food is stuck in your throat?				
10.	Do you cough while swallowing liquids?				
11.	Do you cough while swallowing solid foods?				
12.	Do you experience a change in your voice, such as hoarseness or reduced intensity immediately after eating or drinking,?				
13.	Other than during meals, do you experience coughing or difficulty breathing as a result of saliva entering your windpipe?				
14.	Do you experience difficulty in breathing during meals?				
15.	Have you suffered from a respiratory infection (pneumonia, bronchitis) during the past year?		Yes		No

Appendix J: Adult Norms for the Nine Hole Peg Test of Finger Dexterity[44]

Table 3
Average Performance of Normal Males
on the Nine Hole Peg Test (time in seconds)

Age	Hand	Mean	SD	SE	Low	High
20–24	R	16.1	1.9	.35	13	22
	L	16.8	2.2	.41	13	23
25–29	R	16.7	1.6	.31	14	21
	L	17.7	1.6	.31	15	21
30–34	R	17.7	2.5	.48	14	24
	L	18.7	2.2	.43	14	24
35–39	R	17.9	2.4	.48	15	26
	L	19.4	3.5	.70	14	28
40–44	R	17.7	2.2	.43	14	22
	L	18.9	2.0	.39	16	24
45–49	R	18.8	2.3	.43	15	24
	L	20.4	2.9	.55	15	27
50–54	R	19.2	1.8	.36	15	22
	L	20.7	2.3	.46	16	25
55–59	R	19.2	2.6	.56	14	25
	L	21.0	3.2	.70	17	27
60–64	R	20.3	2.6	.54	15	25
	L	21.0	2.5	.51	18	27
65–69	R	20.7	2.9	.55	15	29
	L	22.9	3.5	.67	18	30
70–74	R	22.0	3.3	.65	17	30
	L	23.8	3.9	.77	16	33
75+	R	22.9	4.0	.80	17	35
	L	26.4	4.8	.96	19	37
All Male	R	19.0	3.2	.18	13	35
Subjects	L	20.6	3.9	.22	13	37

Table 4
Average Performance of Normal Females
on the Nine Hole Peg Test (time in seconds)

Age	Hand	Mean	SD	SE	Low	High
20–24	R	15.8	2.1	.41	12	22
	L	17.2	2.4	.47	14	26
25–29	R	15.8	2.2	.43	13	23
	L	17.2	2.1	.40	15	25
30–34	R	16.3	1.9	.36	13	20
	L	17.8	2.0	.40	15	22
35–39	R	16.4	1.6	.32	14	20
	L	17.3	2.0	.40	15	21
40–44	R	16.8	2.1	.37	14	23
	L	18.6	2.8	.51	15	24
45–49	R	17.3	2.0	.39	13	23
	L	18.4	1.9	.38	16	24
50–54	R	18.0	2.5	.50	14	24
	L	20.1	3.0	.60	16	26
55–59	R	17.8	2.6	.52	14	26
	L	19.4	2.3	.47	16	24
60–64	R	18.4	2.0	.39	15	22
	L	20.6	2.2	.44	17	25
65–69	R	19.5	2.3	.44	16	25
	L	21.4	2.7	.51	17	26
70–74	R	20.2	2.7	.51	15	26
	L	22.0	2.7	.51	18	27
75+	R	21.5	2.9	.58	17	31
	L	24.6	4.3	.85	18	35
All Female	R	17.9	2.8	.16	12	31
Subjects	L	19.6	3.4	.19	14	35