

Written Assignment: Designing an Annual PT Exam

<u>Population</u>	<u>Why</u>
<p>Adults who have had a stroke</p>	<p>A population that would greatly benefit from an annual exam is individuals who have had a stroke. Not only is the incidence of stroke very high (16 million individuals globally per year),¹ but individuals after a stroke experience a range of impairments that can significantly and chronically affect overall function and participation in daily life. Some, but not all, of the impairments include changes in sensation, vision, cognition, muscle tone, speech, balance, gait, perception, personality, motor coordination and control, fatigue/energy level.² Furthermore, individuals after a stroke often retain lifestyle-related risk factors that increase their risk for future stroke or other chronic conditions.^{3,4} In Brewer et al. in 2015, it was reported that at 6 months post-stroke, 68 percent still had a BMI greater than or equal to 25 kg/m,³ 63.4 percent still had blood pressure greater than 140/90 mmHg, and 16.4 percent still reported smoking.³ These are modifiable risk factors that should be addressed to decrease risk for another stroke.⁴ Individuals are also at increased risk for depression and decreased social engagement after a stroke.^{1,5} Additionally, individuals may be at increased risk for falls and musculoskeletal pain from shoulder subluxation and/or contractures.⁶</p> <p>An annual exam would be beneficial to evaluate individuals after stroke for directly physical therapy-related issues such as increased risk for falls⁷ and musculoskeletal pain.⁶ Additionally, physical activity is significantly decreased on average in individuals after a stroke.⁵ Not only have individuals after a stroke been found to exercise at a lower duration and intensity,⁵ but they also take almost 2,000 steps per day less than the general older adult population, with an average of roughly 4,255.6 steps per day.⁵ There are several factors associated with decreased physical activity after a stroke that could be addressed directly or recognized and referred out by a physical therapist. Some of these include depression,⁸ fatigue,^{1,8} self-efficacy,^{1,8} understanding of the benefits of exercise,¹ memory and attention,¹ lack of knowledge about programs,¹ pain,¹ frustration,¹ fear of falling,¹ guilt associated with dependence for transportation and assistance from caregivers.¹ These factors may be the cause of decreased physical activity, the effect, or the relationship may be bi-directional but should still be addressed. Falling is not only a potential cause of decreased activity after a stroke, but it can also lead to head injuries, fractures, and increased disability.⁹ Falling is a common problem after a stroke and can be addressed in physical therapy through screenings, environmental modifications, assistive devices, and balance training.⁹ Furthermore, patients after a stroke that leads to hemiplegia commonly have chronic shoulder pain due to shoulder subluxation and would benefit</p>

from at least annual physical therapy evaluations to assess for any significant changes (risk of subsequent development of complex regional pain syndrome and/or “secondary brachial plexus injury”)⁶ and offer any strategies for management such as pain control with TENS, passive range of motion to maintain mobility, sling for stability, and/or stability exercises (depending on severity).⁶ In terms of contracture management, passive stretching has not been shown to have a significant effect on contracture development;⁶ however, it would still be beneficial to have an annual exam to determine if any modifications to splinting, AFOs, or positioning recommendations need to be made to manage contractures.

While modifiable lifestyle factors such as higher BMI, high blood pressure, smoking alone may not justify an annual *physical therapy* exam, if an annual exam is already indicated for musculoskeletal issues and falls risk, physical therapists may actually be in an optimal position to regularly check in on patients about these other factors and refer as necessary.³ Several studies report that knowledge alone does *not* translate to behavioral changes.^{4,10} According to Ellis and Breland, patients who are most successful at achieving self-efficacy have very specific goals, a positive outlook and confidence in their ability to manage their condition, and the ability and willingness to reflect, recognize, and analyze any decline in function or health.^{4,10} Thus, physical therapists, with relatively long evaluation times (compared to physicians), will have increased opportunity to ask questions to understand each patient’s beliefs about their disease and the effects of lifestyle interventions, as well as any barriers they might have.¹⁰ Elland and Breland emphasize that we must work with them to help them understand *how* to make these changes based on their unique situation.¹⁰ Furthermore, according to Ellis and Breland, therapists should recognize the important opportunity to educate caregivers on their potential role (when appropriate) to facilitate healthy lifestyle choices.¹⁰ An annual exam would allow us to first of all to maintain a relationship of trust and rapport, ask questions about lifestyle behaviors, check vitals, administer depression screenings, assess level of social and caregiver support, and refer as indicated.

Annual exam: subjective/objective

<u>Question/test</u>	<u>What testing</u>	<u>Positive finding</u>	<u>Clinical reasoning (Evidence if indicated)</u>
Do you think being active helps you manage your condition and keep you healthy? (repeat with eating “healthy,” smoking cessation, adequate sleep, stress management, or management of other relevant risk factors)	Patient’s current beliefs about effectiveness of healthy behaviors.	One example: Patient believes ability to manage is more out of their control than in it because “it runs in their family.” Alternatively, they have misguided beliefs about what is acceptable/healthy. For example, they think walking the dog 10-15 minutes is sufficient exercise to maintain health or that 5 to 6 hours of sleep is adequate.	According to Ellis and Breland, it is important to understand the beliefs a patient has about the healthy lifestyle behaviors therapists are promoting because this will help predict their adherence and guide any individualized education to increase understanding. ¹⁰ As discussed in the introduction, many people after a stroke continue to have the same lifestyle behaviors as before their stroke that can put them at increased risk for a subsequent stroke or other chronic diseases. ^{3,4}
What does your diet look like? (repeat with other relevant lifestyle behaviors) Follow up with questions about barriers to eating healthier, getting adequate sleep, etc.	Specific lifestyle factors that would benefit from a goal to make a healthy change to decrease risk for secondary conditions or another stroke	One example necessitating a goal would be if a patient said they only sleep 5 hours each night.	According to Ellis and Breland, setting <i>specific</i> goals is one important factor in facilitating lasting behavioral changes, in order to facilitate setting specific goals that will be helpful and meaningful for each patient, we must ask them questions to understand what would areas would benefit from a change. ¹⁰ Understanding barriers will also help us set reasonable and attainable goals. ¹⁰ For example, if the patient responded with 5 hours of sleep at night, it would be important to understand barriers. Some barriers, such as caffeine later in the day could be modifiable and we could assist in helping patients set

			these goals. However, if a barrier seems like it would indicate potential insomnia, sleep apnea, etc. this question would help guide need for referral.
Body Mass Index (BMI)	Relationship between weight and height used to calculate underweight, normal, overweight, and obese. Measure patient's height in meters and weight in kg (or pounds and convert). Use online BMI calculator to determine BMI using these numbers.	BMI greater than or equal to 25 kg/m ² indicates increased risk for another stroke or other chronic conditions. ^{3,11}	According to Brewer et al., 68 percent of individuals in their study had a BMI greater than or equal to 25 kg/m ² at 6-month follow-up. Brewer et al. and Billinger et al. report that overweight and obesity are associated with increased risk of stroke recurrence and other cardiovascular disease. ^{3,11} This measurement will help us assess risk and bring up professional conversation with patient about risk and strategies including basic nutritional advice and referral to registered dietician and group exercise classes.
Blood Pressure	Systolic and Diastolic Blood Pressure	Brewer et al. reports a recommended blood pressure for "high risk" patients for cardiovascular disease which is less than or equal to 140/90 mmHg. ³	A study by Brewer et al. showed that only 37 percent of individuals 6 months after a stroke had a blood pressure under the recommended value. ³ It is important if we are performing an annual exam to assess blood pressure in individuals after a stroke due to association of high blood pressure with increased risk for subsequent stroke and cardiovascular disease. ^{3,11}
Geriatric Depression Scale	Screening for depression	Sivrioglu et al. reported the cut off for minor depression in individuals post-stroke was 11 on the 30-item	The Geriatric Depression Scale is a measure that can be administered by physical therapists and has been shown to have high reliability and validity. ¹² Administering this test assist

		Geriatric Depression Scale. ¹²	with screening for depression and will provide additional information to determine if additional referral is needed. A score of 11 or greater would indicate need for referral.
Do you have the assistance/support necessary to complete self-care items tasks and attend activities and appointments? Do you feel comfortable asking for help to get to appointments or activities you enjoy?	Assessing available support for transportation for individuals after stroke who require assistance for transportation. Also assessing associated guilt with asking for help as a barrier to participating in physical activity and community engagement.	An example of a positive finding is if the patient answers that they feel guilty or uncomfortable asking for help for transportation to activities because the “caregiver seems tired” or “already does so much.”	Nicholson et al., in a qualitative study interviewed individuals after stroke to assess potential barriers to physical activity. ¹ A common theme was guilt surrounding asking for help for transportation from caregivers, family and friends. It would be important to determine if the barrier is guilt and/or absence of available help for each appropriate patient in order to make the appropriate recommendation.
How many days per week do you exercise? How long do you exercise for on these days and what does the exercise involve?	Assessing current level of physical activity.	According to Billinger et al. in an article for the American Heart Association on physical activity after stroke, the recommended amount of exercise is at least 3 days per week for 20 to 60 minutes each session. ¹¹ This article does suggest breaking up total minutes per day into several shorter bouts depending on the individual patient and their	Individuals after a stroke often have decreased duration, intensity, and frequency of exercise ⁵ due to a multitude of potential barriers as described in the introduction. ^{1,8} Decreased physical activity in individuals after a stroke has been associated with risk factors for cardiovascular disease such as hypertension and altered insulin regulation. ¹¹

		energy capacity. ¹¹ A positive result would be exercising less than the total recommended by Billinger et al. ¹¹	
6 Minute Walk Test	According to Patterson et al., the six-minute walk test may be related to walking endurance and involvement in community activities. ¹³ The six-minute walk test may also be related to VO ₂ max in individuals with milder impairments after a stroke. ¹³	Tang et al. reported that a distance of 288 meters or greater on 6-minute walk test was indicative of ability to walk for a long period of time than walking less than 288 meters in individuals with chronic stroke. ¹⁴ The MCID is suggested as 34.4 meters according to a study by Tang et al. ¹⁴	Lower physical activity level as mentioned above is associated with risk factors for cardiovascular disease. ¹¹ The 6 minute walk helps assess some potential physical barriers to decreased overall activity level including walking endurance and VO ₂ max. ^{13,14} Therefore, less than 288 meters might be <i>one</i> indicator that they are limited in daily step count and activity level. Furthermore, this test can be used at subsequent follow-ups or at each annual exam to measure change, as an MCID does exist for the 6-minute walk test for individuals with chronic stroke. If an individual had a positive change of 34.4 meters on the test, it would potentially be a clinically important improvement in walking endurance. ¹⁴
Do you currently experience any pain/discomfort in your shoulder? Has it changed in the last 6 months?	Testing shoulder pain in shoulder of a patient with hemiplegia.	If patient reports pain or if established pain has worsened.	See following two boxes for importance of assessing for pain in shoulder after a stroke.
Neer Sign	Therapist passively moves patient's shoulder into flexion with full pronation. ⁶	Pain or reproduction of symptoms ⁶	Self-report of pain is important, but Harrison et al. reports that individuals after a stroke often underestimate pain they are experiencing in their shoulder. ⁶ Harrison et al. reported one of the most common physical signs of "post-

			stroke shoulder pain” is a positive test on the Neer test. ⁶
Palpation	Palpate the supraspinatus and bicipital tendon on affected and unaffected side and compare patient report of each side.	Increased pain on affected side may indicate further testing/evaluation for post-stroke shoulder pain and other complications.	Again, patients may underreport their shoulder pain, but they are highly at risk for subluxation and secondary complications as listed in introduction depending on level of weakness, ligamentous laxity, severity of stroke, spasticity or low tone. ⁶ All of these risk factors are important to consider/assess, but in order to determine if pain is present, palpation of supraspinatus and bicipital tendon were also some of the most common signs of pain in the shoulder affected by stroke as reported by Harrison et al. ⁶ Pain with palpation would indicate need for further testing of stability and strength to determine need for further treatment or referral.
Range of motion	Perform passive range of motion to the end feel on all joints to assess contractures.	If end feel is earlier than expected and feels abnormal for the joint, this may indicate contracture.	According to Harrison et al., contractures are common after a stroke and occurred in up to half of individuals in one study reported. ⁶ Stretching may not have an effect on contractures; ⁶ however, an annual exam that involves assessing for contractures would allow us to either refer to be assessed for additional medical treatment (such as Botulinum toxin) if indicated, ⁶ or to provide additional advice and guidance on positioning and bracing.

Activities-specific Balance Confidence Scale ¹⁵	A method to assess fear of falling. This self-report measure is given to assess confidence in ability to not fall in a variety of situations. ¹⁵	The specificity to “rule-in” an individual after a stroke who has a fear of falling is 92.0. ¹⁵ Importantly, Park et al. reported the cut-off for increased risk for falls was 63.75. ¹⁵ Therefore, a score of less would indicate significant decrease in confidence that increases risk for falls. ¹⁵	According to Cho et al., fear of falling can actually increase risk for falls. ⁹ The Activities Specific Balance Scale is a standardized way to assess this fear as well as to provide information as to which situations the patient is particularly fearful of so that they can be accurately addressed. ¹⁵
Have you had any falls? How many in the last month? Any injuries? Did you seek medical treatment/have X-rays?	Used to determine presence of falls and frequency.	Patient report of falls.	Individuals after a stroke can be at greater risk for falls, and falls can lead to increased fear of falling and serious injuries. ⁹ An annual exam would allow physical therapists to determine if the patient has been falling and determine main contributing factors. If a patient has fallen, the physical therapist could use judgement on need for referral for X-ray considering all situational factors. Furthermore, a patient after a stroke who is falling or at risk for falling will benefit from balance screening (next box) and potential screening for environmental modifications.
Mini-BESTest	Follow instructions for Mini-BESTest including various measures of dynamic and static balance.	According to Tsang et al., a score of less than or equal to 17.5 may indicate increased likelihood that the individual in the chronic phase after a stroke has a history of falls (sensitivity of 64.0 percent and	As mentioned previously, individuals after a stroke commonly have impairments in balance ¹⁶ are at increased risk for falls. ⁹ The Berg Balance Scale may have a larger ceiling effect for individuals in the chronic stroke phase than the Mini-BESTest. ¹⁶ A score below 17.5 on the Mini-BESTest may indicate impairments in dynamic balance that could be associated with history of falls ¹⁶ and would

		specificity of 64.2 percent). ¹⁶	indicate follow-up appointments to address balance deficits and offer environmental modifications.
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Resources/referrals: (See Appendix)

Test item	Resource/referral	Reasoning
Geriatric Depression Scale	Notify Primary Care Physician to refer to Psychologist/Psychiatrist AND Stroke Support Group	Individuals after a stroke are at increased risk for depression, with up to one-third of individuals experiencing “depressive symptoms” after a stroke, according to Sivrioglu et al. ¹² Depression can potentially lead to decreased physical activity, ⁸ and it has been shown to lead to increased disability and decreased function after a stroke. ¹² According to Christensen et al. in a qualitative study lack of social support is potentially one factor that contributes to post-stroke depression, and depression may be partially managed by peer support. ¹⁷
Blood Pressure	Notify Primary Care Physician AND Provide general resource on lifestyle supplements for blood pressure	If a patient has a blood pressure of greater than or equal to 140/90 mmHg at annual exam, it would be important to inquire about adherence to medication regimen. ³ Due to increased risk for additional stroke and/or cardiovascular disease with high blood pressure, ³ it would be important to notify Primary Care Physician. It is important for us to take blood pressure in this population before exercising due to potential adverse effects of exercising with uncontrolled blood pressure. ¹¹
Support from caregivers/family/friends	Social work (situational) AND Transportation services AND Support group for patient and/or caregivers	Individuals after a stroke may depend on a caregiver for transportation. They may have feelings of guilt about asking for assistance to get to group exercise programs or therapy appointments. ¹ This may lead to decreased physical activity levels, socialization and community engagement. Determining if this is a barrier and why will facilitate ability to provide appropriate resources. This can directly affect participation in

		<p>follow-up therapy appointments if transportation is an issue. Therefore, finding transportation programs for this patient would be important. If the issue seems larger and the patient could be a victim of neglect/abuse, it would be important to refer to Adult Protective Services and report to the “Director of the County Department of Social Services” directly according to North Carolina General Assembly Article 6: “Protection of the Abused, Neglected, or Exploited Disabled Adult Act.”¹⁸</p>
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Bibliography:

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Appendix (if indicated):

Depression: refer to primary care physician but also provide support stroke group contact information/handout.

UNC Stroke Support Group:¹⁹

When: Second Wednesday each month at 1:00 pm

Where: The Center for Rehabilitation Care (1807 Fordham Boulevard, Chapel Hill, NC 27514)

Blood Pressure:²⁰ Notify Primary Care Physician but also provide this handout.

let's talk about stroke Prevention

let's talk about

High Blood Pressure and Stroke

What is high blood pressure (HBP)?
High blood pressure means that the force of the blood pushing against the sides of your arteries is consistently in the high range. This can lead to stroke, heart attack, heart failure or kidney failure.

Two numbers represent blood pressure. The higher (systolic) number shows the pressure while the heart is beating. The lower (diastolic) number shows the pressure when the heart is resting between beats. The systolic number is always listed first. Blood pressure is measured in millimeters of mercury (mm Hg).

Normal blood pressure is below 120/80 mm Hg. If you're an adult and your systolic pressure is 120 to 129, and your diastolic pressure is less than 80, you have elevated blood pressure. High blood pressure is a pressure of 130 systolic or higher, or 80 diastolic or higher, that stays high over time.

How does high blood pressure increase stroke risk?
High blood pressure is the single most important risk factor for stroke because it's the leading cause of stroke.

HBP adds to your heart's workload and damages your arteries and organs over time. Compared to people whose blood pressure is normal, people with HBP are more likely to have a stroke.

About 87 percent of strokes are caused by narrowed or clogged blood vessels in the brain that cut off the



blood flow to brain cells. This is an **ischemic stroke**. High blood pressure causes damage to the inner lining of the blood vessels. This adds to any blockage that is already within the artery wall.

About 13 percent of strokes occur when a blood vessel ruptures in or near the brain. This is a **hemorrhagic stroke**. Chronic HBP or aging blood vessels are the main causes of this type of stroke. HBP puts more pressure on the blood vessels until they can no longer maintain the pressure and the blood vessel ruptures over time.

Am I at higher risk for HBP?
There are risk factors that increase your chances of developing HBP. Some you can control, and some you can't.

Those that can be controlled are:

- Smoking and exposure to secondhand smoke
- Diabetes
- Being obese or overweight
- High cholesterol
- Unhealthy diet (high in sodium, low in potassium, and drinking too much alcohol)

(continued)

American Heart Association American Stroke Association. Life is why.

let's talk about **stroke**  Prevention

High Blood Pressure and Stroke

- Physical inactivity

Factors that cannot be modified or are difficult to control are:

- Family history of high blood pressure
- Race/ethnicity
- Increasing age
- Gender (males)
- Chronic kidney disease
- Obstructive sleep apnea

Socioeconomic status and psychosocial stress are also risk factors for HBP. These can affect access to basic living necessities, medication, healthcare providers, and the ability to adopt lifestyle changes.

How can I control high blood pressure?

- Don't smoke and avoid secondhand smoke.
- Lose weight if you're overweight.
- Eat a healthy diet that's low in sodium (salt), saturated fat, and *trans* fat.
- Eat fruits and vegetables, whole grains and low-fat dairy products. Include foods rich in potassium.



The only way to know if your blood pressure is high is to check it regularly. Know what your blood pressure should be and try to keep it at that level.

- Enjoy regular physical activity.
- Limit alcohol to no more than two drinks a day if you're a man and one drink a day if you're a woman.
- Take all medicines as prescribed to control your blood pressure.

HOW CAN I LEARN MORE?

- 1 Call 1-888-4-STROKE (1-888-478-7653) to learn more about stroke or find local support groups, or visit StrokeAssociation.org.
- 2 Sign up to get Stroke Connection magazine, a free magazine for stroke survivors and caregivers at strokeconnection.org.
- 3 Connect with others sharing similar journeys with stroke by joining our Support Network at strokeassociation.org/supportnetwork.

Do you have questions for the doctor or nurse?

Take a few minutes to write your questions for the next time you see your healthcare provider.

For example:

What should my blood pressure be?

How often should my blood pressure be checked?

My Questions:

We have many other fact sheets to help you make healthier choices to reduce your risk, manage disease or care for a loved one. Visit strokeassociation.org/letstalkaboutstroke to learn more.

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Caregiver/Social Support:

Reporting Potential Neglect/Abuse:²¹ (for the physical therapist)

Orange County Director of Social Services: Nancy Coston (919) 245-2802

Emergency Phone: (919) 245-2800

General Phone: (919) 245-2800

Transportation services: (to provide to the patient/caregiver or to call with the patient to set up)

Adults over 60 after stroke,²² may be eligible for transportation through Orange County Department of Social Services; therefore, begin by contacting (919) 245-2800.²¹ The Chatham County Council on Aging also provides transportation to activities, lunches, etc. for individuals over 60 in need.²³ They offer group exercise classes and social activities, which may both be beneficial for this population.

Support group for caregivers:

Chatham County Council on Aging Caregiver Support Group:²³

When: Third Monday of each month at 6:00 pm

Where: Eastern Senior Center Pittsboro (356 NC-87, Pittsboro, NC 27312)