

Lab Values – Limitations for Exercise And Physical Activity*

Blood Glucose	100–250 mg/dL	< 100 or >250 limited activity
Platelet Count	< 60,000/mm ³	no resistive exercise
	< 20,000/mm ³	AROM, maybe walking
	< 5,000/mm ³	“no activity”
Coumadin	Protime (PT) or INR > 3	no exercise
Unfractionated Heparin	Partial Thromblastin Time (PTT) > 3x normal range value	no exercise
Hemoatocrit (%)/ Hemoglobin (g/dL)	= 30%/10 g/dL	reduced exercise capacity
	between 24–30%/8–10 g/dL	markedly reduced exercise capacity
	< 24%/< 8 g/dL	no exercise

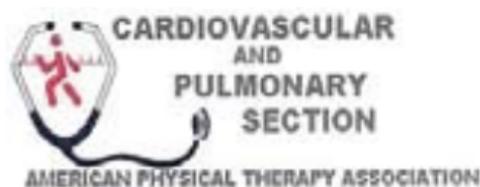
*Expert consensus

Medications Affecting Responses To Exercise or Physical Activity²

Beta Blockers	blunts heart rate and blood pressure responses
Calcium Channel Blockers	decreases resting and exercise blood pressure response; may cause reflex tachycardia, edema, and/or post-exercise hypotension
Digitalis	may cause dysrhythmias and/or tachycardia
Bronchodilators	may increase heart rate and blood pressure; may cause dysrhythmias (if non-selective β agonist)
Diuretics	may cause dysrhythmias; may cause fluid depletion or dehydration
Vasodilators	may increase risk of post-exercise hypotension

Additional information is available at www.apta.org/pfsp.

This document is not intended for use as a patient/client handout.



Physical Fitness for Survivors of Stroke

Neurology and Cardiovascular & Pulmonary Sections of the American Physical Therapy Association in partnership with the American Physical Therapy Association



American Physical Therapy Association
The Science of Healing. The Art of Caring.

1111 N Fairfax St, Alexandria, VA 22314-1488
www.apta.org

Physical Fitness for Survivors of Stroke Based on Best Available Evidence

Recommended Exercise Training Intensity Guidelines for Stroke Survivors¹

Target Heart Rate Range

Graded Exercise Test Performed

50–80% of maximal heart rate achieved

No Graded Exercise Test Performed

40–70% of predicted maximal heart rate (220-age)

Formulas for estimating heart rate are inaccurate in individuals using beta blockers or calcium channel blockers. Lower target heart rates may be indicated. For these individuals, the Borg Rating of Perceived Exertion CR 10 (RPE) may be a better indicator of individual work level. Selection of RPE target should include consideration of individual's current fitness level and exercise tolerance.

Target Borg CR10 Range: 3 (Moderate)–4 using this scale. If using the 6–20 scale, Target Borg Range: 11 (Light)–14.

Borg CR10 Scale

0	Nothing at all	
0.3		
0.5	Extremely weak	Just noticeable
0.7		
1	Very weak	
1.5		
2	Weak	Light
2.5		
3	Moderate	
4		
5	Strong	Heavy
6		
7	Very strong	
8		
9		
10	Extremely strong	“Maximal”
11		
↔		
●	Absolute maximum	Highest possible

Important Things to Know^{2,3}

- 10–15% of individuals s/p CVA may have silent ischemia.
- Individuals with diabetes are more often prone to silent ischemia, postural hypotension, and/or blunted heart rate response.
- DVT complications have been reported in 30–75% of stroke survivors.
- 3–5% of people > 65 years old have atrial fibrillation; ~ 15% of strokes occur in individuals with atrial fibrillation.

When to Monitor Physiologic Responses To Exercise and Physical Activity²

- History of cardiac disease, valve dysfunction, angina, AND/OR other cardiac or pulmonary event.
- Presence of 2 or more risk factors for cardiac disease (eg, smoking, hypertension, dyslipidemia, diabetes, obesity, stress, sedentary lifestyle, family history significant for cardiac disease, age: men \geq 45, women \geq 55).
- Any change in medication regimen.
- Report of new symptoms.
- Progression of exercise program in patient with 2 or more risk factors AND/OR previous cardiac or pulmonary events AND/OR low functional capacity.

Contraindications for Exercise Or Physical Activity^{4,5}

Signs	Resting HR	> 100 bpm or < 50 bpm
	Resting SBP	> 200 mmHg or < 90 mmHg
	Resting DBP	> 110 mmHg
	Oxygen Saturation	< 90%
	Other	cyanosis, diaphoresis, bilateral edema in a patient with CHF, pallor, fever, weight gain > 4–6 lbs/day, abnormal change in breath sounds or heart sounds
Symptoms		SOB, angina, dizziness, severe headache, sudden onset of numbness or weakness, painful calf suggestive of DVT

Indications to Terminate Exercise Or Physical Activity^{4,5}

Signs	HR	sudden drop > 15 bpm, change from regular to irregular rhythm, or exceeds HR maximum
	SBP	> 200 mmHg, decreases to < 90 mmHg, drop > 10 mmHg from resting or with increasing exercise
	DBP	> 110 mmHg
	Oxygen Saturation	< 90%
	Other	cyanosis, diaphoresis, bilateral edema in a patient with CHF, pallor, abnormal change in breath sounds or heart sounds, ataxia
Symptoms		SOB, angina, dizziness, severe headache, sudden onset of numbness or weakness

Assessment of Chest Pain

- Described as pressure, tightness, heaviness, sharp pain, a squeezing sensation and/or “indigestion.”
- Usually located in chest; may radiate to neck, jaw, mid-scapular region, and/or arms; may also occur in isolation in these regions.
- Symptoms may occur with exertion or emotional situations.
- Relieved with rest or nitroglycerine.
- Women present with atypical chest pain more frequently than men; symptoms may include neck/shoulder pain, nausea, vomiting, fatigue, dyspnea with or without chest pain.
- Chest pain that is reproducible with palpation is likely to be musculoskeletal in origin.

Angina Scale⁴

Rating	Description of pain/discomfort intensity
1+	Light, barely noticeable
2+	Moderate, bothersome
3+	Severe, very uncomfortable
4+	Most severe pain ever experienced

Assessment of Shortness of Breath

- Exercise produces a disproportionate ventilatory response AND/OR sensation of dyspnea.
- Upper extremity exercise is more likely to cause SOB in patients with compromised pulmonary status.
- Observe use of accessory muscles, pallor.
- Assess oxygen saturation.
- Patient may complain of (or present with) orthopnea, paroxysmal nocturnal dyspnea, altered respiratory patterns (eg, Cheyne-Stokes respiration, paradoxical breathing).

Dyspnea Scale

0	Nothing at all	
0.5	Very, very slight	Just noticeable
1	Very slight	
2	Slight	Light
3	Moderate	
4	Somewhat severe	
5	Severe	Heavy
6		
7	Very severe	
8		
9		
10	Very, very severe	Almost maximum
•	Maximal	

Mahler, D A et al. *J Appl Physiol*. 2001; 90:2188–2196. Used with permission.

References

- ¹ Gordon NF, Gulanick M, Costa F, Fletcher G, Franklin BA, Roth EJ, Shephard T. AHA Scientific Statement: Physical Activity and Exercise Recommendations for Stroke Survivors. *Circulation*. 2004; 109:2031-2041.
- ² American Heart Association www.americanheart.org
- ³ American Stroke Association www.strokeassociation.org
- ⁴ American College of Sports Medicine. *ACSM's Guidelines for Exercise Testing and Prescription: 7th edition*. Lippincott Williams & Wilkins; 2005.
- ⁵ Fletcher BJ et al. Cardiac precautions for non-acute inpatient setting. *Am J Phys Med Rehabil*. 1993; 72:140–143.