















## Vital Sign Parameter Guidelines

Parameter	Rest	Activity
Heart Rate	 >120 bpm <sup>1</sup>	 >85% HR Maximum <sup>1</sup>
	 <60 bpm <sup>1</sup>	 >80% HRR (Karvonen formula) <sup>1</sup> *Reduce HR range by 10-15 bpm if on beta-blockers <sup>2</sup>
Blood Pressure	 >180/110 mmHG (SBP/DBP) <sup>3</sup> *When either value is close to above limit at rest, reassess after 5 minutes of exercise	 >250/115 mmHg (SBP/DBP) <sup>1</sup> *When either value is close to above limit, stop exercise and reassess after 5 minutes
	 <90/60 mmHG	 Reduction >10mmHg in systolic accompanied by other symptoms of ischemia
SaO <sub>2</sub>	 <92% <sup>1</sup> *Other notable signs may be pallor, wheezing, dyspnea with a reduction of SaO <sub>2</sub> from baseline	 <92% <sup>1</sup> *Other notable signs may be pallor, wheezing, dyspnea with a reduction of SaO <sub>2</sub> from baseline
<b>Diabetes Mellitus Considerations</b>		
Blood Glucose	 <70 mg/dL	
	 70-100 mg/dL *If DM, provide snack and monitor frequently, may require MD referral if hypoglycemia persists	
	 100-250 mg/dL *Proceed with exercise program	
	 >250 mg/Dl *Should check ketones <sup>7</sup> , if ketone levels are ≥1.5 mmol/L – exercise contraindicated <sup>7</sup>	
	Vital education with activity *If symptoms of hypoglycemia develop with activity, recheck BG *Reduction in blood sugar can occur 6-15 hours post exercise <sup>4</sup> and can persist upwards of 48 hours post <sup>5,6</sup> , educate patient that this may occur	

**Note:** Vital Parameter Guidelines prescribed by physician SUPERSEDE the above noted thresholds. Additionally, self-report from patient is of utmost importance to triangulate all clinical findings.

## References

1. *Guideline's for Exercise Testing and Prescription*. American College of Sports Medicine, 10<sup>th</sup> Edition;2018.
2. Cohen-Solal A, Baleynaud S, Laperche T, Sebag C, Gourgon R. Cardiopulmonary response during exercise of a beta 1-selective beta-blocker (atenolol) and a calcium-channel blocker (diltiazem) in untrained subjects with hypertension. *J Cardiovasc Pharmacol*. 1993;22(1):33-38.
3. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2018;138(17):e484-e594.
4. Tsalikian E, Mauras N, Beck RW, et al. Impact of exercise on overnight glycemic control in children with type 1 diabetes mellitus. *J Pediatr*. 2005;147(4):528-534.
5. Gillen JB, Little JP, Punthakee Z, Tarnopolsky MA, Riddell MC, Gibala MJ. Acute high-intensity interval exercise reduces the postprandial glucose response and prevalence of hyperglycaemia in patients with type 2 diabetes. *Diabetes Obes Metab*. 2012;14(6):575-577.
6. Manders RJ, Van Dijk JW, van Loon LJ. Low-intensity exercise reduces the prevalence of hyperglycemia in type 2 diabetes. *Med Sci Sports Exerc*. 2010;42(2):219-225.
7. Colberg SR, Sigal RJ, Yardley JE, et al. Physical Activity/Exercise and Diabetes: A Position Statement of the American Diabetes Association. *Diabetes Care*. 2016;39(11):2065-2079.