

Table 5-9

**EQUATIONS FOR PREDICTING  $\text{VO}_2\text{MAX}$  FROM BRUCE  
TREADMILL (WITH AND WITHOUT HOLDING HANDRAILS)<sup>1,2</sup>**

<i>Protocol</i>	<i>Equation</i>
Bruce Treadmill (without hand-rail support)	$\text{VO}_2\text{max (mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}) = 14.8 - 1.379$ $(\text{time in min}) + 0.451 (\text{time}^2) - 0.012$ $(\text{time}^3)$ $\text{SEE} = 3.35 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$
Bruce Treadmill (with handrail support)	$\text{VO}_2\text{max (mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}) = 2.282 (\text{time}$ $\text{in min}) + 8.545$ $\text{SEE} = 4.92 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$

SEE = standard error of the estimate

### NORMAL FINDINGS

- Average and above aerobic fitness (see Appendix A on page 264)
- Increased heart rate, SBP with increasing workloads

### ABNORMAL FINDINGS

- Below average fitness (see Appendix A on page 264))
- Heart rate or SBP fail to increase with increasing workloads
- Diastolic blood pressure changing  $\geq 10$  mm Hg from standing resting levels

### SPECIAL CONSIDERATIONS

- Initial workload ( $>3$  METs) and steep inclination changes may be challenging for many clients
- Static gastrocnemius and soleus muscle stretching should be encouraged before and following the test
- An active cool down is recommended to prevent blood pooling

### REFERENCES

1. American College of Sports Medicine. *ACSM Guidelines for Exercise Testing and Prescription*. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2006.