**Table 5-9**

**Equations for Predicting VO$_{2}$max From Bruce Treadmill (With and Without Holding Handrails)$^{1,2}$**

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruce Treadmill (without handrail support)</td>
<td>$VO_{2}\text{max (mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}) = 14.8 - 1.379$ (time in min) + $0.451$ (time$^2$) - $0.012$ (time$^3$) SEE = $3.35$ mL$\cdot$kg$^{-1}\cdot$min$^{-1}$</td>
</tr>
<tr>
<td>Bruce Treadmill (with handrail support)</td>
<td>$VO_{2}\text{max (mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}) = 2.282$ (time in min) + $8.545$ SEE = $4.92$ mL$\cdot$kg$^{-1}\cdot$min$^{-1}$</td>
</tr>
</tbody>
</table>

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**