**RMCRI Cancer Treadmill Protocol**

Calculate VO2 using the last completed stage of the RMCRI protocol. If the client completed at least 30 seconds of a stage, average the estimated VO2 values from the two appropriate stages.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Stage** | **Speed (mph)** | **Grade (%)** | **Estimated VO2 peak (mL/kg/min)** | **METS** | **Estimated VO2 peak (Handrails)** | **METS****(Handrails)** |
| **1** | **1.0** | **0** | 6.2 (walk) | 1.7 | 6.2 (walk) | 1.7 |
| **2** | **1.5** | **0** | 7.5 (walk) | 2.1 | 7.5 (walk) | 2.1 |
| **3** | **2.0** | **0** | 8.9 (walk) | 2.5 | 8.9 (walk) | 2.5 |
| **4** | **2.5** | **0** | 10.2 (walk) | 2.9 | 10.2 (walk) | 2.9 |
| **5** | **2.5** | **2** | 12.6 (walk) | 3.6 | 12.1 (walk) | 3.5 |
| **6** | **3.0** | **3** | 15.9 (walk) | 4.5 | 14.4 (walk) | 4.1 |
| **7** | **3.3** | **3** | 17.1 (walk) | 4.9 | 15.2 (walk) | 4.3 |
| **8** | **3.4** | **4** | 19.1(walk) | 5.5 | 16.6 (walk) | 4.7 |
| **9** | **3.5** | **5** | 21.3(walk) | 6.1 | 18.1 (walk) | 5.2 |
| **10** | **3.6** | **6** | 28.0 (run) | 23.6 (walk) | 8.0 / 6.7 | 22.8 (run) | 19.7 (walk) | 6.5 / 5.6 |
| **11** | **3.7** | **7** | 29.6 (run) | 25.9 (walk) | 8.5 / 7.4 | 23.9 (run) | 21.3 (walk) | 6.8 / 6.1 |
| **12** | **3.8** | **8** | 31.3 (run) | 28.4 (walk) | 8.9 / 8.1 | 25.0 (run) | 23.0 (walk) | 7.1 / 6.6 |
| **13** | **3.9** | **9** | 32.9 (run) | (walk) | 9.4 / 8.8 | 26.2 (run) | 24.8 (walk) | 7.5 / 7.1 |
| **14** | **4.0** | **10** | 34.6 (run) | 33.5 (walk) | 9.9 / 9.6 | 27.3 (run) | 26.6 (walk) | 7.8 / 7.6 |
| **15** | **4.1** | **11** | 36.4 (run) | 36.3 (walk) | 10.4 / 10.4 | 28.6 (run) | 28.5 (walk) | 8.2 / 8.1 |
| **16** | **4.2** | **12** | 38.2 (run) | 39.0 (walk) | 10.9 / 11.1 | 29.8 (run) | 30.4 (walk) | 8.5 / 8.7 |
| **17** | **4.3** | **13** | 40.0 (run) | 42.0 (walk) | 11.4 / 12.0 | 31.1 (run) | 32.5 (walk) | 8.9 / 9.3 |
| **18** | **4.4** | **14** | 41.9 (run) | 45.0 (walk) | 12.0 / 12.9 | 32.4 (run) | 34.6 (walk) | 9.3 / 9.9 |
| **19** | **4.5** | **15** | 43.9 (run) | 48.1 (walk) | 12.5 / 13.7 | 33.8 (run) | 36.7 (walk) | 9.7 / 10.5 |
| **20** | **4.6** | **16** | 45.9 (run) | 51.3 (walk) | 13.1 / 14.7 | 35.2 (run) | 38.9 (walk) | 10.0 / 11.1 |
| **21** | **4.7** | **17** | 48.0 (run) | 54.6 (walk) | 13.7 / 15.6 | 36.6 (run) | 41.2 (walk) | 10.5 / 11.8 |

**VO2max Norms (ml•kg-1•min-1)**

**Age Low Fair Average Good High Superior**

**Women**

 20-29 <28 29-34 35-43 44-48 49-53 54+

 30-39 <27 28-33 34-41 42-47 48-52 53+

 40-49 <25 26-31 32-40 41-45 46-50 51+

 50-65 <21 22-28 29-36 37-41 42-45 46+

**Men**

 20-29 <38 39-43 44-51 52-56 57-62 63+

 30-39 <34 35-39 40-47 48-51 52-57 58+

 40-49 <30 31-35 36-43 44-47 48-53 54+

 50-59 <25 26-31 32-39 40-43 44-48 49+

 60-69 <21 22-26 27-35 36-39 40-44 45+

Source: Astrand, *ACTA Physiol Scand* 49(suppl): 169, 1960. Blackwell Scientific Publications, LTD.