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Presenter/author	Title	Abstract
Turner, Nina **Sinkule**, E. **Eschenbacher**, W. *National Institute for Occupational Safety and Health* *Division of Respiratory Disease Studies,* *1095 Willowdale Road* *Morgantown, WV 26505* *USA*	**Metabolic and Respiratory Responses During the Performance of a 60-Minute Man Test 4**	Human physiological variables, such as body weight, height, strength, and aerobic capacity, can affect the results of such exercise tests as that used for Man Test 4 (MT4), a U. S. respirator certification test described in Title 42, Code of Federal Regulations, Part 84. The Automated Breathing and Metabolic Simulator (ABMS) is a computer-controlled system designed to simulate human oxygen consumption, carbon dioxide production, and minute ventilation. The purpose of this research was to characterize the metabolic responses of various body weight human subjects performing a 60-minute MT4, with the intent to use these results in the development of an ABMS test protocol for respirator certification. Fourteen male volunteers performed MT4 for one hour while they wore a portable, telemetric metabolic measurement device weighing 0.5 kg. The subjects were stratified into four body weight categories: 80-86.5 kg (BW1, n=4); 86.6-92.5 kg (BW2, n=4); 92.6-100 kg (BW3, n=4); and >100.5 kg (BW4, n=2). Heart rate (HR), minute ventilation (V.E), tidal volume (VT), oxygen consumption ($V.O_2$), carbon dioxide production ($V.CO_2$), and respiratory quotient (RQ) were measured for every breath and averaged for each minute of each task. There were no significant differences among the four body weight categories for mean MT4 HR, V.E, VT, or RQ. Mean MT4 $V.O_2$ was significantly greater for BW3 (1.53 $L \cdot min^{-1}$) and BW4 (1.69 $L \cdot min^{-1}$) than for BW1 (1.06 $L \cdot min^{-1}$, $p<0.05$). Mean MT4 $V.CO_2$ was significantly greater for BW3 (1.40 $L \cdot min^{-1}$) and BW4 (1.41 $L \cdot min^{-1}$) than for BW1 (1.07 $L \cdot min^{-1}$, $p<0.05$). For all MT4 tasks except the overcast, these data represent lower values than those observed or predicted in previous research (Kamon, 1975). These differences are the result of the absence of steady-state conditions in the current study.