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### Oxygen and Carbon Dioxide Levels During Qualitative Respirator Fit Testing

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#### Year and Degree

2004, MS, University of Cincinnati, Medicine : Industrial Hygiene (Environmental Health).

#### Abstract

Approved Occupational Safety and Health Administration qualitative respirator fit test methods require the use of a test hood about the subject's head and shoulders. Workers fit tested by this method have commented on the discomfort of being inside the test enclosure. This study was designed to quantify some parameters that might lead to these types of comments. For this study, subjects performed a series of four respirator fit tests. A quantitative and a qualitative fit test were performed with a full facepiece respirator. Then a quantitative and a qualitative fit test were performed with an N95 filtering facepiece respirator. Parameters measured include: subjects height, weight, and age, oxygen and carbon dioxide levels, air temperature, heart rate, arterial oxygen saturation, and Borg Ratio Scale value on breathing exertion. Carbon dioxide levels are significantly higher and oxygen levels are significantly lower in the respirator when the test hood is used during the qualitative fit test. The temperature inside the test hood rose an average 7.5°F in the course of the qualitative fit test of the N95 filtering facepiece device. These stressors are not present during a quantitative respirator fit test. Professionals conducting respirator fit tests should be aware of the physiological burdens that may occur during the qualitative respirator fit test. Some groups may be especially sensitive to this test such as the elderly, pregnant women, persons with pulmonary and/or cardiac disease, or persons with psychological disorders such as anxiety, panic disorders, or claustrophobia.

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#### Committee

Dr. Roy McKay (Advisor)

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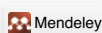
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