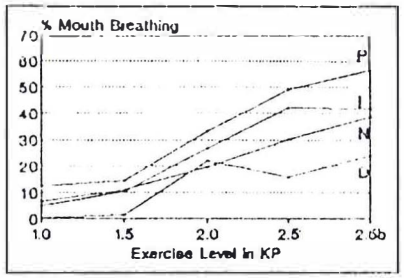
R01-OH-02005
End-Date-08-31-1991
Respirators

NASAL-ORAL FLOW PARTITION WITH RESPIRATOR USE

P. Harber*, J. Beck, P. Hsu, J. Luo,
Occupational Medicine Branch, UCLA, Los Angeles CA

Am Rev Respir Dis
1991; 143: A104

Breathing through the oral route (versus nasal) significantly decreases the total airflow resistance but also bypasses the benefits of nasal "air conditioning". Therefore changes in the partitioning of airflow between the nasal (N) and oral (O) routes may affect respirator tolerance. Eleven healthy volunteers performed progressive work on a bicycle ergometer while wearing a full face mask respirator under the following conditions: Disconnected (D) from apparatus; No Load (N; small resistance due to pneumotachometer and spirometer); Inspiratory Resistance (I) using a single respirator cartridge; Pressure Bias (P; simulating pressure demand respirator with a 10cm Peep valve). N-O partition was determined by a short time constant thermistor adjacent to mouth. As shown by the figure (and confirmed by ANCOVA analysis) increasing exercise led to a shift N to O. In addition, respirator related resistance (I) and pressure loads (P) caused a shift from nasal to oral breathing particularly at higher exercise levels.



Supported by NIOSH grant R01-OH-02005