COVER PAGE FOR
the PDF file of

Vilke GM, Michalewicz B, Kolkhorst FW, Neuman T, Chan TC;

Does weight force during physical restraint cause respiratory compromise?

Acad Emerg Med May 2005;12(5 Supplement 1): page 16.

The unpublished paper presented at the May, 2005, Annual Meeting of the **Society for Academic Emergency Medicine.**

Because this Paper Presentation's abstract was so BRIEF,
I typed the whole thing out when I originally posted it in my Restraint Asphyxia Library.

This PDF file of the abstract contains:

A copy of the actual Supplement's Paper Presentation Abstract … as it was obtained from the Internet.

The REVIEW I wrote of this paper presentation is on its Restraint Asphyxia Library page. To read it, go to:
http://www.charlydmiller.com/LIB06/2005newweightstudy.html
and use the "skip" link to go to "CHAS' REVIEW."

YOURS, CHAS
(Ms. Charly D. Miller)

Academic
Emergency Medicine

Acad Emerg Med Volume 12, Number 5_suppl_1 16,
 Academic Emergency Medicine Volume 12, Number 5 suppl 1 16,

EMS

Does Weight Force during Physical Restraint Cause Respiratory Compromise?

Gary M. Vilke, Betty Michalewicz, Fred W. Kolkhorst , Tom Neuman and Theodore C. Chan

University of California, San Diego: San Diego, CA, San Diego State University: San Diego, CA

ABSTRACT

Background: Violent patients often require physical restraint by emergency department (ED), out-of-hospital, and law enforcement personnel. Concern has been raised that weight force, commonly applied during the restraining process, can compromise respiratory function, placing individuals at risk for asphyxiation. **Objective:** To determine the impact of heavy weight force on pulmonary and respiratory function on restrained human subjects. We hypothesized that weight force would result in changes in pulmonary and respiratory parameters. **Methods:** 10 volunteers completed a randomized crossover, controlled trial in an exercise physiology laboratory. Subjects were placed in 5 positions in random order: sitting, prone hobble restraint, prone with light weight (LW: either 75 or 50 lb depending on

subject body weight) on the back, prone with medium weight (MW: 150 or 125 lb), and prone with heavy weight (HW: 225 or 200 lb). While in these positions, maximal voluntary ventilation (MVV) measurements were performed in following ATS criteria for reproducibility within 5% variability on 3 repeated measures. Raw data were converted to percent predicted values for subject race, height, and gender as per standard practice for pulmonary function tests allowing comparison with known population clinical normal values. Data were compared utilizing ANOVA ($p < 0.05$) and 95% confidence intervals (CIs). **Results:** Mean % predicted values for MVV were significantly higher in the sitting position (122%; 95% CI = 103.5% to 140%) compared with all other positions, including the restraint position (100%; 95% CI = 98.7% to 101.6%), LW (107%; 95% CI = 97.3% to 117.4%), MW (96%; 95% CI = 87.2% to 102.8%), and HW (85%; 95% CI = 71.6% to 97.5%). However, only the HW position resulted in a CI that fell below 100% of predicted for subjects and none of the mean % predicted values fell below the standard 80% threshold for clinical abnormality. **Conclusions:** Significant weight force in the prone position decreases MVV; however, we did not detect decreases below known clinical thresholds for abnormal pulmonary function.