

matched for age, sex, CAD risk factors and VS. Computerized discriminant function analysis was performed. Positive MEXT was defined ≥ 1.0 mm flat or downsloping ST depression .08 second after J point. +MEXT occurred in 25/35 (71 percent) HT patients and 22/35 (66 percent) CAD patients ($P > .05$). Total VS was 3.6 in HT vs 3.3 in CAD ($P > .05$); 16/20 (80 percent) HT patients with 3VS had +MEXT vs 17/21 (81 percent) CAD patients with 3VS ($P > .05$). MEXT in HT vs CAD: ST segment $\downarrow$ 1.6 vs 1.8 mm ($P > .05$); incidence of PVCs $> 5/\text{minute}$ ($P > .05$). Echographic left ventricular wall thickness (LVW): 1.17 cm in HT vs 1.08 in CAD ($P > .05$). In 11 patients HT subset with ECG left ventricular hypertrophy (LVH): LVW 1.29 and ST $\downarrow$ 1.9 mm ($P > .05$ vs all HT patients). There was no difference ($P > .05$) in +MEXT in HT with LVH vs HT without LVH: 7/11 (63 percent) vs 18/24 (75 percent). MEXT functional class and angina were same in HT vs CAD ($P > .05$). Thus, MEXT is useful in detecting CAD in HT. However, there is no difference ($P > .05$) in sensitivity or specificity of MEXT in CAD with or without HT. In addition, LVH with HT does not affect MEXT identification of CAD.

Airways response to Micro-Aerosolized Delta-9-Tetrahydrocannabinol. Louis Vachon; Arthur G. Robins; Edward A. Gaensler, Boston

Marihuana and delta-9-THC, its principal psychoactive ingredient, decrease airways resistance in normal individuals and asthmatics. In previous studies, bronchodilation has been accompanied by substantial tachycardia and psychologic "high." In an attempt to dissociate these effects from bronchodilation, we administered a micro-aerosol of THC (0.7 mg) dissolved in propylene glycol. Seven normal subjects and ten asthmatics were tested with propylene glycol alone, with THC, and with isoproterenol. In asthmatics, THC decreased airways resistance (-16 percent at 90 minutes, $P < .05$) and increased flow rates ($\text{FEV}_1 + 9$ percent, $\text{MMF} + 22$ percent, $P < .01$). Tachycardia from THC was not significant and no subject experienced more than transient "relaxation." Four subjects increased their airways resistance after vehicle alone; of these, two had no response to THC and two decreased airways resistance. We conclude that low-dose micro-aerosolized THC is an effective bronchodilator. Interestingly, some asthmatics but no normal subjects responded to the propylene glycol aerosol with increased airways resistance.

CO₂ Threshold Ventilatory Responses in Asthmatic and Normal Subjects. John C. Vandree, and Archie F. Wilson, Irvine, Cal.

Occlusion pressures (P_{100}) and minute ventilatory ($\dot{V}_E$) responses to CO₂ were measured in eight asthmatic patients and compared to a group of normal subjects. $\dot{V}_E$ was characterized by two and three phase linear increases to increasing carbon dioxide with wide interindividual differences in the threshold of CO₂ at which phase increases occurred. P_{100} also demonstrated wide interindividual differences in the threshold of CO₂ at which exponential increase occurred. No differences between the asthmatic and control groups were noted, although individual asthmatic patients either had very blunted response to carbon dioxide or had linear increases occurring only after end tidal CO₂ with 55 mm Hg. No difference in response in $\dot{V}_E$ or P_{100} to increasing levels of CO₂ was noted in the asthmatic group after terbutaline. It is concluded that as a group, asthmatic patients respond like normal control patients in respiratory response to increasing

levels of carbon dioxide but wide interindividual differences commonly occur. A subset of asthmatic patients with blunted response or high threshold to carbon dioxide may be at increased risk if respiratory insufficiency should occur.

The Effect of Colloid Osmotic Pressure and Pulmonary Capillary Wedge Pressure on Intrapulmonary Shunt. Richard W. Virgilio; David E. Smith; Charles L. Rice; Charles L. Hobelmann; Christopher K. Zarins; David R. James; Richard M. Peters, San Diego

Application of the Starling equation to fluid dynamics within the lung would suggest that a significant decrease in the gradient between the serum colloid osmotic pressure (COP) and pulmonary capillary wedge pressure (PCWP) secondary to either an increase in PCWP or a decrease in COP would cause an egress of fluid from the capillary and an increase in the amount of pulmonary extravascular water (PEVW). This should create intrapulmonary shunting (Q_s/Q_t) and produce hypoxia. The relationship between changes in this gradient (COP-PCWP) and Q_s/Q_t were studied in 43 patients (157 simultaneous determinations) following hemodynamic resuscitation with various fluids. The mean values ($\pm$ standard error) and extremes for each of the variables were: PCWP $10.3 \pm .04$ mm Hg (0-30), COP 19.1 ± 0.3 mm Hg (8.4-27.6), COP-PCWP 8.7 ± 0.4 mm Hg (-10.6 — 23.4) and Q_s/Q_t $15.6 \text{ percent} \pm 0.4$ (7.4 — 26.3). The slopes of all regressions between Q_s/Q_t and the other variables were not detectably different from zero. Marked decreases in COP-PCWP (-10 mm Hg) secondary to hemodilution (COP 8.4 mm Hg) with crystalloid resuscitation failed to produce clinical evidence of increasing PEVW. Only two patients demonstrated pulmonary edema, both of whom had normal COP's but elevated PCWPs. Evidence from our animal laboratory would indicate that decreasing serum COP's are associated with increases in pulmonary lymph flow with minimal increase in PEVW. The lack of correlation between decreases in COP and increases in Q_s/Q_t suggests that the use of oncotic agents such as albumin during resuscitation to minimize pulmonary insufficiency is unwarranted.

Effect of Morphine upon Hypoxic Ventilatory Response. Jonathan M. Ward, John V. Weil, Denver

Little is known of how morphine depresses respiration. This study examines the effect of morphine on hypoxic ventilatory drive at different levels of arterial Pco₂ and pH. In 12 urethane-anesthetized cats, 0.25 to 1.0 mg/kg morphine decreased the ventilatory response curve 30.1 ± 4.4 percent ($P < .01$) by decreasing respiratory rate 27.5 ± 4.0 percent ($P < .01$), with an insignificant fall in tidal volume of 2.8 ± 5.3 percent. Morphine significantly depressed the ventilatory response to hypoxia at constant levels of arterial Pco₂ and pH of 38.0 ± 2.1 and 7.298 ± 0.019 by 47.3 ± 8.3 percent ($P < .01$). The response was similarly decreased by morphine despite hypercarbia of 44.5 ± 1.6 and pH of 7.247 ± 0.018 by 33.9 ± 4.7 percent ($P < .01$). There was no significant difference in the response to hypoxia at the two different levels of Pco₂ and pH. Thus, morphine significantly depressed hypoxic ventilatory response separate from Pco₂ and pH effect.

Identification of Potential Iatrogenic Infections Associated with Fiberoptic Bronchoscopy. Harold Weinstein; Roger Bone; William Ruth, Kansas City, Kansas

With the increasing use of the fiberoptic bronchoscope (FB)