

## II. *Effect of Different Levels of Ambient Carbon Monoxide on Maximal Work Capacity*

### *Introduction*

Previous investigations (10, 12, 13, 14, 15) suggested that a linear decline in aerobic power ( $\dot{V}O_{2 \max}$ ) occurred with a progressive increase in carboxyhemoglobin (%COHb) levels. The requisite COHb levels were obtained prior to the maximum aerobic power test by breathing a high concentration of carbon monoxide -- a bolus (BO) presentation. The resultant COHb levels were between 7 and 33%. The earlier investigations of this project during which young and middle-aged men, smokers and nonsmokers, continuously breathed air containing 50 ppm of CO -- a buildup (BU) presentation -- failed to demonstrate any significant decrease in  $\dot{V}O_{2 \max}$ , although the duration of effort in this progressive test was significantly shortened. The COHb levels in these studies were 2.7% for nonsmokers and 4.5 and 5.2% respectively for young and middle-aged smokers. Several possibilities exist to explain these differences. The mode of presentation of CO may be a factor or the level of ambient inspired CO may not have been high enough to have interfered with oxygen transport. There is a necessity to determine the precise level of COHb at which aerobic capacity is impaired and to relate this level to the ambient concentrations of CO present in our air environment.

### *Methods*

Four healthy adult male volunteers aged 24-33 years were subjects for the present investigation. Three were nonsmokers and the fourth abstained from his pipe smoking for a minimum of 12 hours prior to each test. They had been engaged in numerous previous studies and were well