SECTION C-1
Wednesday, May 5
1:30 p.m to 4:45 p.m.
Co-Chairpersons: John L. Boyer
San Diego State University
San Diego, CA
Henry S. Miller, Jr.
Wake Forest University
Winston-Salem, NC

1:30 p.m.
INFARCT SIZE AND EXERCISE CAPACITY AFTER
MYOCARDIAL INFARCTION
C. L. Carter and L. R. Amundsen. Physical Therapy Department,
University of Iowa, Iowa City, Iowa

Estimation of infarct size from serum creatine phosphokinase elevations on 20 acute myocardial infarction (AMI) patients was compared to their functional exercise capacity determined by a bicycle ergometer. Eleven patients entered a controlled exercise program for three to four months and were subsequently retested. The increase in aerobic power was 1.42 ± 0.5 (mean ± SE) METs after three months of the exercise program which was significant (t = 2.77, p < .02). The aerobic power of the exercise group was also significantly greater than an unpaired control group tested the same number of months after infarct. Patients grouped 2.5 to 4.5 months post AMI demonstrated a correlation between aerobic power and estimated infarct size (r = .68, n = 15). This correlation was closer (r = .84, n = 11) after three to four months of a controlled exercise program.

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1:45 p.m.
FUNCTIONAL CAPACITY FOLLOWING CORONARY BY-PASS
SURGERY
Gundersen Clinic Ltd. and University of Wisconsin, La Crosse,
Wisconsin

Changes in myocardial oxygen supply were evaluated in 19 patients following coronary by-pass surgery (CBS) for angina pectoris (AP). A near-maximal graded exercise test (GXT) was performed before and 2-19 (x 7.5) months following CBS. After surgery the patients were urged to resume full activity and were individually managed in a 10-week "at home" exercise program. Increases were demonstrated for predicted oxygen uptake and work load (p < .005), and rate pressure product (p < .02) following CBS, suggesting increased myocardial blood flow. Terminal heart rate showed no significant increase. Of 19 patients exhibiting ST segment depression (≥ 1 mV) with AP during GXT before surgery, 10 cases experienced total relief of both of these signs after surgery. A correlation between the pre-operative number of occluded coronary arteries (>50%) and the degree of exercise induced ST segment depression revealed no significant trend. Additionally, no significant relationship was found between post-operative GXT results and the number of bypass grafts performed on each patient. This may be due to the number of cases under investigation. This study supports the premise that the effectiveness of CBS, in improving functional capacity, can be objectively evaluated by a non-invasive GXT.

Philip K. Wilson
Human Perf. Lab.
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2:00 p.m.
CARDIORESPIRATORY ADAPTATION TO SUBMAXIMAL AND
MAXIMAL ARM AND LEG EXERCISE
P. S. Fardy, D. P. Webb and H. K. Hellersm. Dept. of Med.,
Case Western Reserve University, Cleveland, Ohio

Central and peripheral adaptive mechanisms were evaluated in 22 young healthy males, mean age 16.9 yrs, during and after multi-stage cycle ergometer exercise of arms (A) and of legs (L). O2 uptake (VO2), minute ventilation (VCO2), heart rate (HR), systolic blood pressure (SBP) and A and L Vlms were measured. The correlation between limb Vlm and VO2max was r = 0.65, p < 0.01, although respective correlations for A and L Vm and VO2max were only r = 0.14 and r = 0.02, p > 0.10. VO2max was 45% higher with L work, p < 0.01, but when considered per cc of limb Vlm VO2max in A was twice that of L. Ve, HR, SBP and Htks SBP were also significantly higher during maximal L work. Differences in respiratory exchange ratio (R) and O2 pulse in maximal exercise were not significant. VO2max, Ve, HR, SBP, HRxSBP and R were significantly greater in A exercise when compared at the same submaximal workload and when compared at the level of maximal A work. Higher myocardial demand in A exercise determined by HRxSBP indicates increased sympathetic tone when exercising smaller muscle groups at the same absolute work level. O2 pulse was the same in A and L work. Regression equations between %HRmax and %VO2max revealed no difference between A and L work compared at the same relative workload, y = 1.2x-29.3, r = 0.91 (A) and y = 1.3x-36.3, r = 0.97 (L). Preceding exercise based upon a % of maximal HR or VO2 is therefore the same whether using upper or lower extremities.

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Paul S. Fardy
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2:15 p.m.
CARDIOVASCULAR FUNCTION AS INFLUENCED BY
CIGARETTE SMOKING: A CROSS SECTIONAL INVESTIGATION
Human Performance Laboratory, California State University, Fullerton, California

Maximal oxygen uptake (VO2max), blood pressure (BP) and myocardial function as estimated by left ventricular systolic time intervals (STTI's), both uncorrected and corrected for age and heart rate (HR), were evaluated in 506 males, age 27-74, at rest and in response to a standardized exercise test. STTI's were derived from simultaneous tracings of the electrocardiogram, phonocardiogram and carotid pulse wave, and included total electromechanical systole (Q-S2), left ventricular ejection time (LVT), pre-ejection period (PEP), PEP/LVT and total cycle time converted to HR. Measures were compared between smokers (S), n = 118, and non-smokers (NS), n = 388, and among light, moderate and heavy categories of smoking. There were no significant differences between S and NS or among levels of smoking in age, height, weight, occupation or leisure time physical activity. Q-S2 and LVT (uncorrected) were longer while HR was lower at rest and in response to exercise in NS compared to S, whereas only post exercise Q-S2 (corrected) was longer in NS, p < 0.01. There were no significant differences in blood pressure or VO2max between S and NS, p > 0.10 and there were no significant differences in STTI's, BP or VO2max across categories of smoking. Results suggest a slight advantage in cardiovascular function for NS compared to S but that the intensity of the smoking habit has less effect.

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