

Baldwin D, E McFalls, D Jaimes, P Fashingbauer, T Nemzek, H Ward. Myocardial glucose metabolism and ATP levels are decreased two days after global ischemia. *J Surg Res* 1996;63:35-38.

We hypothesized that following reversible myocardial ischemia recovery of glucose metabolism would be prolonged and would parallel recovery of high energy phosphate levels. Normothermic ischemia was achieved in dogs by aortic cross-clamping for 20 min on cardiopulmonary bypass. Glucose uptake was determined by [18F]fluorodeoxyglucose uptake and positron emission tomography (PET) 1 week pre-ischemia and at 2 and 7 days post-ischemia (n = 8). Oxygen consumption (MVO₂) and glucose uptake were also measured by Fick. In a separate group of animals, adenosine triphosphate (ATP) and creatine phosphate (CP) levels were measured by left ventricular/septal biopsies at baseline, 2 days, and 7 days (n = 6). Glucose uptake, as measured by PET, was reduced to 15% of baseline at 2 days post-ischemia and returned to normal by 7 days post-ischemia (P < 0.05). These results were confirmed by Fick measures of glucose uptake. ATP levels were reduced to 49% of pre-ischemic levels at 2 days and returned to baseline by 7 days (P < 0.05). CP and MVO₂ levels were normal at 2 and 7 days following ischemia. We conclude that reduced glucose uptake in the presence of intact oxidative metabolism suggests that glucose is not the favored substrate for ATP production following ischemia.

