

140: 2, 1954). Elderly patients have been shown (Briggs, B. D., and others: *J. A. M. A.* 160: 1439, 1960) to be the most susceptible group. Beyond surgical causes direct depressant effects of general anesthetics are most frequent. In this pilot study of a very large problem our attention has been directed toward: (1) Is hypotension during actual operating conditions due primarily to peripheral vasodilatation or depression of cardiac output? (2) In the absence of the usual medical indications for digitalis, does prophylactic digitalization in the elderly protect against hypotension during anesthesia, and if so, by what mechanism? (3) In treatment of hypotension by sympathomimetic amines, are those having primarily vasoconstrictor or primarily positive inotropic action more effective? Patients over 60 having intra-abdominal operations were digitalized or not at random, anesthetized with thiopental, nitrous oxide-ether and followed with constant intra-arterial pressures, ECG, EEG and repeated cardiac output determinations. If hypotension occurred, it was treated by different vasopressors, also selected at random, hemodynamics being followed the while. In this preliminary study of 10 patients a moderate to marked fall in cardiac output occurred in 7, accompanied by a simultaneous rise in calculated total peripheral resistance—the blood pressure being relatively well maintained. During the course of surgery this pattern tended to reverse although blood levels of anesthetic (ether) remained high. The initial fall in output may reflect direct depressant effect of anesthetic on the myocardium or, secondarily, an elevation in peripheral resistance due to norepinephrine elevations, demonstrated by Price (*Anesthesiology* 20: 563, 1959) to accompany ether anesthesia in man. Hypotension requiring vasopressor treatment occurred in four patients. Response to vasopressor drugs was variable and numbers too few to draw conclusions. There was no apparent difference in cardio-vascular response between the four digitalized and six non-digitalized patients, but again the numbers are too few for valid comparisons.

The Response of Radiated Animals to Anesthetics. HOWARD L. ZAUDER, M.D.,

PH.D., AND LOUIS R. ORKIN, M.D. *Department of Anesthesiology, Albert Einstein College of Medicine, New York 61, New York.* White mice (Webster) weighing 20–25 Gm. were irradiated with a 250 kv. radiotherapy unit. Physical factors were such that the dose rate was 52 roentgens per minute. A dose response curve relating dose of radiation to thirty day mortality was constructed. Thirty day LD₅, LD₂₅, and LD₉₅ doses were selected. These represent total body irradiation of 350r, 450r, and 750r respectively. At intervals of 1, 2, 4, 7, 14, 21, and 28 days following cardiation, the animals were placed in a specially designed chamber (Zauder, H. L., and Orkin, L. R.: *Anesthesiology* 20: 707, 1959) and anesthetized with 6 per cent diethyl ether, 7 per cent divinyl ether, 2.5 per cent trichloroethylene, and 1.5 per cent halothane. Mortality was determined 30 days post anesthesia except for the animals subjected to 750r where 7 day mortalities were used. Statistical significance of the results was determined by the chi square test. At the 350r level mortality was not significantly increased if the animals were anesthetized with diethyl ether or halothane within 14 days following exposure. After this period mortality was greatly increased in the anesthetized groups. Ether was somewhat safer than halothane at this time. Divinyl ether was associated with high mortality. During anesthesia with this agent, mortality was high in the experimental group whereas there were no deaths in the control animals. Trichloroethylene occupied an intermediate position. At 450r divinyl ether and trichloroethylene anesthesia were associated with a high death rate. At this level of radiation, however, mortality following diethyl ether was high when anesthesia was administered within the first two weeks; death associated with halothane was highest during the latter half of the experimental period. When the mice were exposed to 750r mortality with all agents was 100 per cent at the end of seven days. Vaporization of the anesthetic agents in an oxygen enriched atmosphere did not affect the results at any level. [Supported by Research and Development Division, Office of the Surgeon General Department of the Army. Contract No. DA-49-007-MD-962.]