

venous cannulae. With the availability of simple heart-lung machines, which may be primed with crystalloid solutions, it may be feasible to use extracorporeal circulation as an adjunct to cardiac resuscitation in a variety of clinical circumstances. (Joseph, W. L., and Maloney, J. V.: *Extracorporeal Circulation as an Adjunct to Resuscitation of the Heart*, J.A.M.A. 193: 683 (Aug. 23) 1965.)

RESUSCITATION Cessation of breathing movements and absence of pulse and heart sounds no longer can be considered signs of death. Death should be defined as evidence of irreversible cerebral destruction with unconsciousness. So, when a patient is found in acute respiratory or circulatory distress and he is not known to be in the terminal stages of an incurable disease, he should be considered salvable and treated promptly with a complete resuscitative effort. After the base line of cerebral oxygenation has been established, the situation should be assessed. Unnecessary prolongation of the act of dying should be avoided if the underlying disorder appears incompatible with survival or if there is clear-cut evidence that the hypoxic episode produced irreversible cerebral damage. (Safar, P.: *Cardiopulmonary Resuscitation Postgrad. Med.* 38: 7 (July) 1965.)

EXTERNAL CARDIAC RESUSCITATION External cardiac massage combined with artificial ventilation appears to be the method of choice for the management of cardiac arrest or ventricular fibrillation. Direct open cardiac massage would appear indicated where the chest is already open or where cardiac tamponade is suspected. It is well to bear in mind that the thoracic cage in a recently dead person is quite pliable, being completely relaxed and non-resistant. Fractures of the sternum produce instability of the chest, which may require tracheotomy and assisted ventilation. Too rigorous compression should likewise be avoided to prevent rupture of a dilated, diseased heart, or of the upper abdominal viscera. Intravenous or intracardiac administration of epinephrine hydrochloride (1 or 2 ml. of 1:1,000 or 1:10,000) is helpful for its cardiac stimulatory effect and also for its intense vasoconstrictive effects upon less

vital circulatory areas. Once a spontaneous heart beat is restored, isoproterenol hydrochloride (1:50,000 intravenously in 0.5-2 ml. doses, depending on patient size) and sodium bicarbonate (2-4 mEq./kg., intravenously) or tromethamine are useful adjuncts. (Lillehei, C. W., and others: *Four Years' Experience With External Cardiac Resuscitation*, J.A.M.A. 193: 651 (Aug. 23) 1965.)

CARDIAC MASSAGE The overall results of cardiac resuscitation in 128 patients are summarized. This includes all patients for whom the cardiac resuscitation team was called because of sudden circulatory arrest manifest as loss of pulses and heart sounds and diagnosed by a physician. Instances of cardiac arrest occurring in the operating rooms have been excluded. Most of the patients were between 50 and 80 years of age, but survival was more common among those under 50. Of the 128 patients, 38, or 30 per cent, survived for more than 24 hours, and 23, or 18 per cent, were ultimately discharged from the hospital. Ventricular fibrillation was recorded in 44 of the patients and included 13 of those surviving. Asystole was diagnosed in 54 patients, and 7 of these survived. Metabolic acidosis and raised arterial-lactate levels were found in most patients. Correction of the acidosis with intravenous sodium bicarbonate was found beneficial. (Smith, H. J., and Anthonisen, N. R.: *Results of Cardiac Resuscitation in 254 Patients*, *Lancet* 1: 1027 (May 15) 1965.)

MESSAGE COMPLICATIONS Closed-chest cardiac massage is not without complications. Most of these are rib or sternal fractures, but bone marrow emboli, hemothorax, hemopericardium, pneumothorax, mediastinal emphysema, gastric rupture, and lacerations of spleen, liver, and blood vessels also occur. A case of aortic rupture secondary to sternal fracture emphasizes that extreme caution should be used to prevent overcompression of the sternum. There is a tendency to compress the sternum more than necessary during the emergency, and the risks are further compounded in the treatment of an elderly patient with a fixed chest. (Nelson, D. A., and Ashley, P. F.: *Rupture of the Aorta During*