

is no constancy in the amount required even in individuals of the same species.

"The prerequisites for the development of an air embolus are: (1) a vessel which is in a state of incomplete collapse, either because its wall is only partly opened, or because fascial attachments prevent its retraction, and (2) suction produced by negative venous pressure or else the introduction of air under positive pressure into the circulation.

"These conditions are satisfied during many therapeutic procedures. Among the most common are the establishment and maintenance of pneumothorax, pneumonectomy, lobectomy, thyroidectomy, radical breast amputation, puncture of the paranasal sinuses, fractures of the long bones, continuous intravenous injections, perirenal insufflation, introduction of air into a joint cavity or the bladder; and of more interest to obstetricians, the induction of abortion, manipulation of the pregnant and puerperal uterus and, lastly, tubal insufflation.

"The presence of air embolism is recognized by sudden shock, dyspnea, and cyanosis. If air is in the large veins, hissing sounds may be heard and bruits or churning noises are heard over the heart area. If air escapes into the arterial circulation, there is blindness. This is caused by air in the retinal vessels and may readily be seen by the ophthalmoscope. There may also be areas of skin blanching due to interference with the capillary circulation. Death may be instantaneous or may occur within several hours. About 15 to 50 per cent of the cases end fatally. If the patient survives the first fifteen minutes, the prognosis is good; if she survives the first hour, coma and paralysis clear.

"There is no uniformity of opinion as to the mode of death. The common theories state that the non-compressible air replaces the compressible

blood in the right heart, thus causing cardiac standstill. This alone, or obstruction in the pulmonary bed by air prevents the transfer of oxygenated blood from the right ventricle to the left auricle. Other theories postulate that coronary artery embolism is the cause of death, while others state that the ischemia of the vital brain centers produces the fatal result."

A. W. F.

NORRIS, J. F.: *A Mortality Study of 187 Deaths in 66,376 Live Births*. *Am. J. Obst. & Gynec.* 49: 554-566 (April) 1945.

#### "Anesthesia

"There is a total of eight cases in which the anesthesia was the cause of death. There was nothing of any particular or outstanding significance as far as age, parity, past medical or surgical or obstetric history is concerned. Only one patient was a private case.

"In two of these eight cases, open drop ether was the method of anesthesia, and in one it was used for sixty-five minutes, using a 2¼ pound can—perhaps too long and too much anesthesia. In the other, food regurgitated and asphyxiation occurred. This untoward result could not have been prevented because it is necessary often to anesthetize obstetric patients without much previous preparation of their gastro-intestinal tract. In the other case, gas oxygen ether with chloroform added was used. This undoubtedly is a poor combination and should not have been used. Whether this fatality would have occurred without the addition of chloroform, is difficult to say.

"There were five deaths in which spinal anesthesia was used. In one, a combination of 10 mg. of pontocaine and 100 mg. of novocain was used. In all others, 100 mg. of novocain was

used. In two cases, the exitus was so sudden that the patient expired undelivered, and in the other case, an agonal cesarean section resulted in delivery of a living child. There will ever remain some risk due to anesthesia, and in a total of 66,376 births, 8 cases died of anesthesia, a ratio of 1 to 8,297.

"This represents the sum total of our experience with anesthesia, and in attempting to assess the element of preventability, one must say that, with the exceptions noted, all the approved and standard technical criteria and procedures were followed and adhered to, and in viewing the problem from this standpoint, there is present an element of preventability in but two of the eight cases."

A. W. F.

HAND, L. V.: *Anesthesia for Gynecologic Surgery*. Surg. Clin. North America, Lahey Clinic Number 530-535 (June) 1945.

"Anesthesia for gynecologic operations must insure the maximal degree of safety for the patient. . . . The methods of choice for minor procedures are intravenous, inhalation and caudal anesthesia. The inhalation anesthetic agent of choice is cyclopropane. The use of cautery or high frequency currents in these operations introduces the factor of explosive hazard. In the presence of this hazard an intravenous agent is employed, preferably pentothal sodium. . . . The methods of anesthesia for major procedures may be classified under two main groups, inhalation anesthesia and spinal anesthesia. The inhalation anesthesia employed for these operations is closed system carbon dioxide absorption with cyclopropane-ether, either with or without endotracheal intubation. The customary agents employed for spinal anesthesia at the Lahey Clinic are pontocaine and nupercaine.

. . . For operations probably lasting less than one and one-half hours and requiring little or no Trendelenburg position, pontocaine with dextrose solution by the Lahey Clinic (Sise) technic has proved satisfactory. Combined perineal and intraabdominal operations frequently exceed one and one-half hours. These operations often are performed in moderate to steep Trendelenburg position. . . . In such operations nupercaine, 1 to 1500 dilution, using a modification of the Howard Jones technic is employed. . . . Our agent of choice for continuous spinal anesthesia is pontocaine-dextrose. . . . Supplementary anesthesia is occasionally resorted to when the patient is uncomfortable as a result of traction reflexes. This supplementary anesthesia may be administered by inhalation or by intravenous injection." 5 references.

J. C. M. C.

WAINWRIGHT, G. A.: *Experiences with Pentothal During the First 100 Days Following the Normandy Invasion*. Canad. M. A. J. 52: 484-488 (May) 1945.

"No. 4 Canadian General Hospital, with a normal capacity of 600 beds, functioned during this first 100 days following the Normandy invasion as a C. C. S. rather than as a static base hospital. Only those cases requiring urgent surgery could be dealt with during those strenuous days. During this period 2,203 cases were operated on and pentothal was the anaesthetic agent employed in 1,887, a percentage of 86.3. Of these 1,887 cases it was used as a single agent in 1,790, and in combination with other agents in 97. . . . Two grams of pentothal was decided upon as the maximum dose to be used and this was rarely exceeded. . . . Routinely, morphine gr.  $\frac{1}{8}$ , and atropine gr.  $\frac{1}{150}$  were given 45 minutes before operation. If the crowded