

tubercle bacilli when removed from the patient's face; 6, or 15.4 per cent, still were contaminated with tubercle bacilli after being washed in water according to the technic all too frequently employed, whereas none contained tubercle bacilli after being washed in water and then soaked for one hour in the formaldehyde-alcohol solution. . . . After removal, all of these parts should be thoroughly washed with soap and hot water until the odor of formalin cannot be detected. This is necessary in order to avoid a skin burn during the next administration and to eliminate the irritating formalin fumes from the apparatus. We have observed no deleterious effect to the patients or the apparatus." 3 references.

J. C. M. C.

HENDERSON, YANDELL, AND TURNER, J. M.: *Artificial Respiration and Inhalation: The Principle Determining the Efficiency of Various Methods*. J. A. M. A. 116: 1508-1515 (Apr. 5) 1941.

"In the thirty odd years since Schafer introduced prone pressure artificial respiration, this method of resuscitation has come to be used in all English speaking countries to the virtual exclusion of all other manual methods. . . . Outside the English speaking countries, however, the Silvester and other older methods are still extensively used. . . . All these methods, old and new, were demonstrated by means of photographs and respiratory measurements at the International Congress on Resuscitation and First Aid at Zurich in August, 1939. One of us participated, and in this paper we shall draw in part on the evidence there presented. . . .

"In all manual methods, expirations are induced by the operator compressing the chest of the patient with his hands, or by pressing the diaphragm up against the bases of the lungs. The Schafer method differs from the others

in the fact that this is all that the operator attempts to do. To induce inspirations he merely removes his hands or quickly releases the pressure, it matters not which. The inspirations are therefore wholly due to the elastic recoil of the chest in the intervals between compressions. But in order to permit this expansive force or recoil to come into play the more easily, the patient's arms are once and for all placed as far forward as possible; one of them is bent at the elbow with the head resting on it. The chest is thus brought initially, as far as possible, into the inspiratory position. . . . The technic is therefore extremely simple; it requires much less exertion on the part of the operator than any other method, and it can be maintained longer without fatigue. The one requirement for maximum efficiency is that the tempo shall be slow enough and the intervals between compressions long enough to allow the chest to expand all that it will. In patients with broken ribs prone pressure is the least harmful form of manipulation. All, or nearly all, the other manual methods attempt to contribute actively to the expansion of the chest by pulling the arms, rolling the body or lifting the shoulders. . . .

"When the volume of air which a normal man breathes in natural respiration and then the amount of artificial respiration that can be induced by the Schafer, Silvester or any other manual method are measured, all these volumes—that of natural breathing and those under the various forms of artificial respiration—are always essentially the same in liters of air per minute. . . . No manual method tested in this laboratory or demonstrated at Zurich, no matter how vigorously applied, has ever produced any considerable degree of overventilation of the lungs, as demonstrated by the fact that when the artificial respiration is stopped the subject, after apnea of only

a few seconds at most, immediately begins to breathe again for himself. . . . The principle determining the efficiency of all methods of artificial respiration is . . . found to be essentially the same as the principle controlling the volume of natural breathing. It is the influence of the blood gases on the respiratory center that largely determines the tonus of the respiratory muscles; and this tonus is a principal factor in the volume of lung ventilation alike in natural breathing and in artificial respiration. Because of this principle, no manual method—neither prone pressure nor any other—can induce any larger volume of lung ventilation than the tonic elasticity of the body at the moment permits. . . .

“Mechanical respiration, unless so forcible as to be harmful, does not increase the volume of natural breathing. Inhalation of carbon dioxide and oxygen increases the efficiency of manual artificial respiration but increases the antagonism between mechanical respiration and natural breathing. In brief, the best method of resuscitation from drowning and electric shock is prone pressure artificial respiration supplemented by inhalation of carbon dioxide and oxygen. The best method of resuscitation from carbon monoxide asphyxia is inhalation of carbon dioxide and oxygen, initiated in cases of severe involvement by prone pressure artificial respiration.” 22 references.

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WYNNE, R. L.: *Mechanism of Partial Rebreathing in Anaesthesia*. Brit. M. J. 1: 155-157 (Feb. 1) 1941.

“Partial rebreathing is justified in so far as it promotes lung expansion and oxygenation, and retains the warmth and moisture of the upper respiratory contents while permitting adequate ventilation below. Its extent is modified in the continuous-flow ma-

chine by adjustment of the gas flow, and in the intermittent-flow machine by adjustment of the bag capacity. The patient's effective alveolar ventilation is controlled, as always, by the alveolar CO<sub>2</sub> concentration. For continuous-flow machines there is a ‘critical flow’ in the neighbourhood of 5 litres per minute for each individual, which if diminished will lead to CO<sub>2</sub> accumulation, but which if exceeded allows equilibrium to be attained. Continuous flow is dangerous with a flow below the critical level; intermittent flow is dangerous with an unlimited bag capacity.” 5 references.

J. C. M. C.

BATTEN, D. H.: *Spinal Anesthesia in Cesarean Section*. Anesth. & Analg. 20: 115-118 (Mar.-Apr.) 1941.

This is a report of the records of the Methodist Hospital, Brooklyn from 1928 to 1940 and shows 96 cases of cesarean section where spinal anesthesia was considered the method of choice.

“Reports of the surgical procedures written at the time of operation indicate that spinal anesthesia has these advantages: (1) No disturbance of previously existing pathology in the respiratory, circulatory, or genitourinary systems of the mother, (2) relaxation of the abdominal muscles permitting easier and speedier work, (3) good tone of uterine contractions, (4) diminished blood loss, (5) decreased nausea and emesis, (6) no need of resuscitation of baby.

“Spinal anesthesia was found to be of particular value in those patients who had acquired an upper respiratory infection or whose previous existing pulmonary disease would render the use of ether unwise. Toxemia was considered a definite indication for spinal anesthesia when cesarean section was contemplated.

“The agents and dosages used in this