

that may be available in transient military establishments. . . . Intravenous anesthesia has been proved to be a safe anesthetic technic, but . . . I believe that it is safe only in skilled hands. . . . Pentothal sodium proved itself sufficient when reinforced by drip infusion of isotonic solution of sodium chloride and inhalation of oxygen in major orthopedic procedures. The administration of pentothal sodium is safe in experienced hands only, and ether is the preferred anesthetic for administration by men of the training corps." 26 references.

J. C. M. C.

ETSTEN, BENJAMIN: *Anesthesia for Thoracic Surgery*. New York State J. Med. 43: 1980-1984 (Oct. 15) 1943.

"Patients who required thoracic surgery present varying degrees of pulmonary dysfunction. . . . Respiratory function tests are of value because they serve as guides in determining the degree of impairment of ventilation due to partial obstruction of the airway, reduced capacity of movement of the lungs, and the reduced distensibility of the lungs. . . . The problems attendant on chest surgery vary with the degree of respiratory reserve, the pulmonary pathology, the patency of the tracheo-bronchial tree, and the extent of the surgical procedure. . . . Postural drainage is performed in the morning. . . . Preanesthetic medication should be administered only after an efficient evacuation of the secretions. . . . The maintenance of the correct position of the patient on the operating table should not interfere with respiratory activity. . . . The legs are flexed to obviate any tension on the abdominal wall in order not to hinder diaphragmatic excursions. The anterior brace is placed at the level of the xiphoid and the posterior one opposite the sacrum. The

braces are placed so that the abdomen or chest will not be constricted between two points. Straps are placed over the hips and knees to keep the patient in place. This method of positioning the patient allows unrestricted activity of the healthy lung. . . . The lowering of the head aids the venous return of the heart and improves cerebral circulation. . . . The head-down position of more than 20 degrees inhibits pulmonary exchange. A compensatory increase in respiratory rate takes place with a resultant tiring of the chest musculature. This position is supposed to be important from the standpoint of drainage of secretions by gravity. . . .

"Lipiodol studies were made to determine the degree of head-down position necessary for secretions from the uppermost bronchus to gravitate directly into the trachea without spilling over to the dependent lung. It was found that at least a 35-degree head-down position was necessary to avoid contamination of the opposite lung. This position does not protect the apices from secretions in cases of bronchiectasis where the disease is at the bases of the lungs. Therefore, it seems that either a 35-degree Trendelenburg or the head-up position may be effective during a lobectomy for bronchiectasis and also for drainage of empyema with a bronchopleural fistula. The flat position is all that is necessary when there is a minimum of secretions. The moderate head-down position can be reserved for cases which incur diminished circulatory blood volume. The Trendelenburg should be steep for gravity drainage of material from the pulmonary tree. . . . Waters' carbon dioxide absorption to-and-fro method has definite advantages for anesthesia in thoracic surgery. . . . Endotracheal intubation is considered essential during open chest surgery for the provision of a patent airway, the avoidance of laryn-

geal spasm, and as a means for the removal of secretions from the trachea and bronchi. . . . Cough during open chest surgery is ineffective in clearing secretions. It may cause damage to the lung and give rise to circulatory disturbances. However, an active cough reflex during extrapleural surgery may be of great value in clearing the trachea and bronchi, especially in such procedures as the drainage of lung abscesses, drainage of empyemas complicated with a bronchopleural fistula, and in certain thoracoplasties. . . . Vagal reflexes may occur, regardless of the anesthetic agent, when traction is applied to the hilar region of the lung or during dissection about the major bronchus. Usually an increased depth of anesthesia, release of traction, or cessation of surgery will result in the disappearance of the reflexes. . . .

"An open pneumothorax is present as soon as the pleural cavity is entered. The lung on the affected side collapses; the mediastinum shifts and compresses the other one. Full expansion of the sound lung during spontaneous respiration is reduced. Maximal inspiration of the chest wall and diaphragm set in, and there is a compensatory increase in mechanical respiratory effort. Since the thorax does not expand equally in all directions, but only in certain limited directions, the expanding lung makes internal adjustments and may produce a torsion and twisting of the bronchi during increased breathing. Spontaneous respirations, if allowed to persist, would result in an increased oxygen demand, exhaustion of the respiratory muscles, and a diminished elimination of carbon dioxide. . . . Positive pressure anesthesia is a method whereby manual pressure is applied to the breathing bag, increasing intrabronchial pressure, during the inspiratory and expiratory phase of respiration. Positive pressure anesthesia interferes with the bellows ac-

tion and the mixing of the physiologic gases. The elimination of carbon dioxide from the alveolar spaces is entirely dependent upon the mixing action of the lungs. Increases of carbon dioxide without notable clinical signs may occur. Ventilation is hampered the respiratory efforts become straining in character during the expiratory phase. This method always affords the risks of impacting secretion in the smaller bronchi with subsequent atelectasis. The term 'controlled respirations' signifies that the active respiratory efforts of the patient have been abolished and that pulmonary ventilation is under the control of the anesthetist. . . . Criticism of this technique has been that the cessation of respiration would remove the greatest safeguard against overdosage and that the anesthetist would be at a loss as to depth of anesthesia. This would apply to those not familiar with the method. . . . The advantages of this method are that the dangers of an open pneumothorax are abolished. Efficient tidal exchange can be accomplished. Adequate oxygenation with removal of carbon dioxide is insured. The diaphragm is motionless and the thoracic musculature is at rest. . . . The clearance of secretions of the tracheobronchial tree, the early return of an active cough reflex, cortical sedation without central depression, and oxygen therapy are the essential points in the postoperative treatment." 6 references.

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MARTIN, S. J.: *Anesthesia for Thoracic Surgery in the Army*. New York: State J. Med. 43: 2178-2182 (No. 15) 1943.

"Chest injuries have occurred in all American wars, contributing materially to the high rate of morbidity and mortality of the wounded. In one of the most extensive analyses, it has been re-