postoperative atelectasis have been avoided by the inhalation of this gas. The understanding of the relation of breathing to the pH of the blood is essential in the interpretation of chemical findings during changes in respiration. As Hasselbach and Henderson showed, the crucial formula in the present conception of the acid base balance of the blood is as follows: The hydrogen ion concentration of the blood is equal to a constant times the ratio of the amount of carbon dioxide in the form of carbonic acid in simple solution in the blood, to the alkaline reserve or $BHCO_3$, this ratio being in the proportion of 1 to 20. The amount of carbon dioxide in solution is merely a function of the partial pressure of the gas and can be increased by diminished ventilation or decreased by greater ventilation. . . . Thus, breathing by its control on carbon dioxide is one of the important factors in the preservation of the hydrogen ion concentration of the blood. . . .

"The nervous control of respiration has been reinvestigated and much new information has been obtained with some of the newer technical devices: for example, the number of impulses passing over the vagus nerves can be determined by an oscillograph. . . . Lastly, the discovery of a new enzyme has done much to clarify the rapid conversion of carbon dioxide to carbonic acid in the red cell. This enzyme is called 'carbonic anhydrase.' As you may remember, when carbon dioxide enters the blood it immediately passes for the great part into the red blood cell where carbonic acid is formed. It seemed almost inconceivable that a purely chemical reaction, such as this, could occur so rapidly without the assistance of an enzyme. The discovery of carbonic anhydrase makes possible such a reaction and gives further confidence in the chemical and physiological conceptions of carbon dioxide transport."

J. C. M. C.

THORSON, J. A.: *Intratracheal Anesthesia in Head Operations.* J. Iowa M. Soc. 31: 465–471 (Oct.) 1941.

"With few exceptions, intratracheal anesthesia is indicated in all operations of the head and neck where general anesthesia is preferred. . . . Active inflammatory disease or new growths in or adjacent to the larynx contraindicate tracheal intubation. The consensus of opinion is against endotracheal anesthesia in goiter work except where pressure on the trachea causes gross respiratory embarrassment. . . . Tracheal intubation assures patency of the airway so that constant adequate oxygenation minimizes rigidity. Endotracheal anesthesia likewise prevents spasm of the glottis which leads to anoxemia, respiratory exhaustion and shock. . . . Safety against intrathoracic sequelae is assured by the existing intratracheal avenue for the removal of mucus and exudate. There is ever present a functioning equipment for artificial respiration and the set-up permits very rapid variations in the depth of anesthesia and the maintenance of extraordinary light levels without adverse reaction. Definitely less anesthetic is used. . . .

"As to disadvantages, Clement states that the use of a laryngoscope . . . requires a deep plane of anesthesia to avoid injury to teeth and the soft structures of the mouth and throat. . . . Clement also mentions the possibility of epistaxis from inserting a Magill tube through the nose, and damage to the throat or vocal cords if an oversized catheter is used or if undue roughness is exerted during the insertion. . . . The question of premedication must be settled by the individual operator. . . . Tuohy advocates spraying the nose with a local anesthetic. . . . The technic

of inserting an intratracheal tube is simple and quickly mastered and pays enormous dividends in ease, comfort and safety to the surgeon who employs it. Having acquired the technic, the user is at once rewarded by the absence of the complications encountered in general anesthesia for surgery of the head and neck, including eye, ear, nose, mouth and throat operations." 16 references.

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EVERSOLE, U. H.: *Anesthesia for Surgery About the Head.* J. A. M. A. 117: 1760–1764 (Nov. 22) 1941.

"This discussion is not intended as an exhaustive treatment of the subject of anesthesia for surgery about the head but rather as a discussion of some of the technical problems with which the anesthesiologist is confronted when an operation is to be performed in this region of the body. . . . There are many factors that the anesthesiologist must consider if he is to select the proper anesthetic agent and method of its administration for any type of surgery. Some of these factors have a peculiar significance when the operation is to be performed in the region of the head. Some of the more important of these may be considered under one of the following heads: (1) proper preparation of the patient for operation, (2) selection of the proper agent, (3) employment of a method of administering this agent that will insure an adequate and unobstructed airway at all times, (4) facilities readily available for the treatment of respiratory and circulatory depression, (5) an anesthetic technic which will in no way hamper the work of the surgeon, (6) precautions against explosion when inflammable anesthetic agents are being used and (7) adequate protection for the patient's eyes. . . . In the selection of the proper anesthetic agent for any type of surgical procedure, the question of adequate oxygen, as well as the explosion hazard, must be considered. . . . One of the most important factors to be considered in the management of any type of anesthesia is the maintenance of an adequate and unobstructed airway at all times. This is particularly important for any type of surgery about the head. . . . A method of administration should be employed that will not only permit the anesthetist to observe the depth and character of the patient's respirations but also enable him to render effective treatment should any marked degree of respiratory depression become manifest. . . . The anesthetist must be on the alert for signs of disturbed respiration and should have facilities immediately available to carry out artificial respiration for an indefinite length of time should it be necessary. . . .

"When a long or shocking surgical procedure is anticipated, or if during the course of any surgical procedure there is considerable blood loss or evidence of impending shock, a continuous intravenous drip of fluid should be started. This affords a means of replacing fluid and is also a route for the administration of blood should a transfusion be necessary. In the actual treatment of shock there is no fluid that is as valuable as whole blood. . . . Adrenergic drugs such as epinephrine, neosynephrin, ephedrine and pitressin are occasionally indicated. At best their action is only temporary. . . . Extreme care should be taken to prevent irritating agents such as iodine and alcohol from getting in the eyes. Furthermore, safeguards should be taken to prevent drapes from being forced down against the eyeball. Even in the absence of an irritating agent, if an eye is left open during the course of an operation a rather serious keratitis may develop as a result of the drying of the cornea. If the draping is such that the anesthetist cannot readily