

protein regeneration. Elmann and Weiner have recommended the use of intravenous fluids containing amine acid mixtures. Finally, the danger of intravenous hypertonic and even isotonic solutions of sodium chloride should be kept in mind when hypoproteinemia is present. Edema of the body tissues may be precipitated, due to fixation of the sodium chloride and water in the tissues. Such 'salt' edemas are apt to resist treatment. The use of desoxycorticosterone acetate is contraindicated. . . .

"Since this paper was submitted for publication, we have transfused into human beings ascitic fluid which preliminary cross-matching tests had revealed to be incompatible with the blood of the prospective recipient. No reactions occurred." 122 references.

J. C. M. C.

ALEXANDER, JOHN: *Preoperative and Postoperative Care of Patients with Surgical Diseases of the Chest*. Arch. Surg. 40: 1133-1150 (June) 1940.

"Countless patients have failed to recover their health or have died after technically perfect thoracic operations solely because the surgeons failed to apply with intelligent understanding those preoperative and postoperative measures that are based on a thorough familiarity with thoracic physiology and pathology and with the behavior of diseases of the chest.

"*Diagnostic and Observation Period*. . . the decision as to which patients should be treated surgically, the choice of operation and the surgical management of the patient require of the internist or surgeon a deep knowledge of both the medical and surgical aspects of thoracic disease and the reaction of one on the other. Cardiocirculatory disease, including compensated valvular lesions, does not necessarily contraindicate extensive thoracic operations,

which, however, should be performed in stages when possible.

"The slightest objective evidence of dyspnea and cyanosis at rest in bed or after slight exertion is an ominous sign if the contemplated operation is one that would reduce the respiratory functional reserve. . . .

"Roentgen Examination. . . . detailed roentgen examination is the most important means of diagnosis.

"*Pneumothorax*.—Preoperative induction of pneumothorax may give useful roentgen information as to whether neoplasms and other lesions are in the lung, thoracic wall or mediastinum. . . . Exceptionally, inspection with the thoracoscope and removal of a specimen for microscopic examination may give valuable diagnostic aid.

"*Bronchograms*.—The value of intrabronchial instillation of iodized oil followed by taking of roentgenograms is well known, but the danger that the oil may cause an acute and dangerous increase in tuberculous or nontuberculous pneumonitis is less generally recognized. The recommendation is therefore made that major operations should not be carried out within two months of the instillation of iodized oil if more than traces of the oil have been retained.

"*Bronchoscopy*.— . . . universally recognized as an indispensable diagnostic and therapeutic measure. Ideally, the bronchoscopist for patients on whom thoracic operations are to be done should be the thoracic surgeon.

"*Preparation for Operation*.—*Postponement of Operation*.—The results of surgical treatment will be better in certain chronic diseases if patients who are "run down" are given a preoperative period of rest in bed and adequate diet. . . .

"*Interval between stages*.—Sufficient time should be allowed between the stages of staged operations for the patient to recover fully from any debility

or increase in temperature which the previous operation may have caused.

“Aspiration of Air or Fluid from Pleural Cavity.—Positive pressure of fluid or air in the pleural cavity should similarly be reduced before any operation involving the pleural cavity, lung or mediastinum. The greatly increased intrapleural pressure . . . exposes the patient to grave dangers of cardiorespiratory depression.

“Anesthesia.—Anesthetic agents that produce the least possible impairment of respiratory function should be chosen when they do not present counterbalancing disadvantages. Assuming expert administration, cyclopropane is probably the best general anesthetic agent in that anoxemia can be avoided and respiration is quiet. So that the patient will be awake shortly after completion of the operation, some anesthetists substitute nitrogen monoxide for cyclopropane during the last fifteen or twenty minutes of anesthesia. Apart from this, nitrogen monoxide is superior to cyclopropane because surgical anesthesia requires that the patient be kept in a cyanotic-anoxemic condition, even when 40 per cent oxygen and 60 per cent nitrogen monoxide are used.

“Ether given by the drop method is, per se, eminently safe, but it increases pulmonary secretion and produces relatively prolonged sleep. Prolonged nausea and vomiting are incidental disadvantages of ether. Intravenous pentothal sodium, together with oxygen inhalation, for operations lasting as long as an hour and a half is an excellent anesthetic agent for patients who have been found to have a prolonged period of vomiting or otherwise react badly to other general anesthetic agents.

“Local and regional anesthesia are excellent for thoracic operations that are not extensive ones, especially when preoperative dyspnea requires that all free pulmonary secretions be expectorated during the operation.

For the same reason an inhalation anesthetic should be given through an intratracheal catheter.

“Avertin in amylene hydrate to supplement other anesthetic agents is dangerous, because this may produce several hours of unconsciousness with resulting possible anoxia. Spinal anesthesia has no important advantages in thoracic procedures over other safer forms of anesthesia.

“Operation.—Virtually all thoracic operations, whether with local or general anesthesia, should be carried out with the operating table in 10 or 15 degrees Trendelenburg. The reverse Trendelenburg position should be used when empyema with a bronchopleural fistula is being drained with local anesthesia.

“The routine administration of saline solution or blood is advisable only when prolonged operations are contemplated. A patient who has had an extensive thoracic operation should, if possible, be transferred directly to his own bed rather than to a stretcher. Every patient should have his shoulders and arms protected by a pinned blanket or sheet shawl . . . a blanket that is merely laid over the patient's shoulders becomes displaced, exposing him to dangerous chilling.

“Postoperative Management. Shock. — . . . a type of shock, the signs and symptoms of which are similar to those of ordinary shock; that is, peculiar to thoracic operations and that is subject to special preventive and therapeutic measures. The chief causes of this type of shock are paradoxical respiratory movement with resulting cardiorespiratory incompetence and anoxemia, accumulation of secretions with resulting anoxemia, etc.

“Intravenous Fluids.—The routine intravenous administration of 3000 cc. of fluid (alternately 1000 cc. 95 per cent dextrose solution, 1000 cc. of Ringier's solution or physiologic solution of

sodium chloride and 1000 cc. of 5 per cent dextrose solution) probably averts surgical shock that would be more difficult to manage if fluids were not given until signs of shock had developed. If shock should occur and not be controlled by the fluids mentioned, a blood transfusion, blood serum or acacia should be given.

Oxygen Inhalation.—Oxygen is given routinely only after pneumonectomy, lobectomy, removal of large intrathoracic neoplasms, oesophagectomy and pericardectomy. . . . The simplest efficient method of administering oxygen is by way of a humidifier through an intranasal catheter or a face mask.

Paradoxic Respiratory Movement of Thoracic Wall.—Weakening of the bony thoracic wall . . . an inward or paradoxic movement of the awakened part of the thoracic wall during inspiration and an outward or paradoxic movement during expiration. The underlying portion of the lung undergoes similar paradoxic movements, and a mobile mediastinum swings from side to side. . . . The effect of these phenomena is that ventilation and circulation of the lungs are inefficient and anoxemia results. When the condition is severe, symptoms are labored breathing, cyanosis, rapid pulse, lowered blood pressure, and inefficient coughing and expectoration. Measures that are useful in overcoming the condition are: administration of oxygen; a firm pressure dressing; ordering the patient to evacuate retained pulmonary secretions; blood transfusion. . . . Drinker respirator may be life saving.

Aspiration of Air or Fluid from Pleural Cavity.—If signs of thoracic shock should occur during or after a thoracic operation when any fluid or air is still present in a closed pleural cavity, the surgeon should suspect that the intrapleural pressure has been unduly increased by collapse of the thoracic wall. The surgeon should immediately determine the pressure and

if the pressure is higher than — 5 cm. of water, or in some cases — 10 cm. of water, he should aspirate air (or fluid).

“The lungs of patients who have undergone open intrapleural operations and who do not require a postoperative therapeutic pneumothorax should be expanded as quickly as possible either by the inflation of the lung by positive pressure in the gas anesthesia apparatus before the incision in the parietal pleura has been closed air tight or by postoperative aspiration by needle. . . .

Air-Tight Tube Drainage of Pleural Cavity.—A very negative intrapleural pressure should be avoided during the first postoperative days because of the circulatory impairment that may result from sudden traction on the mediastinum. A pressure of — 8 or — 10 cm. of water is safe during the first day or two, and may then be gradually lowered to — 20 or even — 30 cm. of water if advisable. Cardiorespiratory disturbance, pain or pleural bleeding suggests that the pressure is too low. The tube should be kept patent in cases of lobectomy until the intrapleural space is obliterated.

Evacuation of Pulmonary Secretions.—If secretions are present during or at the end of the operation, they should be aspirated by the anesthetist. As soon as the patient awakens from anesthesia and while the table is still in Trendelenburg position, the patient should be directed to cough. . . . Until fully awake and able to cough efficiently . . . bed should be kept in Trendelenburg position to promote gravitation of secretions toward the mouth. Heavy doses of narcotics and opiates are dangerous as they obtund the cough reflex. . . . some patients are unable to evacuate their pulmonary secretions. Aspiration at intervals by intranasal introduction of a catheter into the trachea and bronchi will prove invaluable. In occasional instances the

bronchoscope should be used for aspiration of secretions.

“*Pain.*—Severe pain is rare if the surgeon has been gentle while operating. Small doses of opiates should keep the patient reasonably comfortable. Since muscle spasm is a frequent cause of postoperative pain, changes in the patient's posture may prove useful.”

R. B. S.

STONEBURNER, L. T., III, AND FINLAND, MAXWELL: *Pneumococcic Pneumonia Complicating Operations and Trauma: Analysis of Two Hundred and Seventy-nine Cases of Postoperative and Ninety-two of Post-traumatic Pneumonia Associated with Typed Pneumococci.* J. A. M. A. 116: 1497-1504 (Apr. 5) 1941.

“It is probably fair to say that pneumonia occurring after surgical operations or after serious trauma is usually considered by both surgeons and laymen to be an unfortunate complication which often results in fatalities when the treatment of the primary condition is otherwise successful. Some of the predisposing factors relating to the operation, notably anesthesia, aspiration, emboli and decreased pulmonary ventilation, have been given some consideration in recent years with the primary object of prevention and only secondarily from the point of view of therapy. The bacteriologic aspects of the pulmonary complications have received only minor attention. A few reports have indicated that postoperative pneumonia is usually associated with the so-called group IV pneumococci, and therefore the suggestion is made that these organisms either are ordinary oral contaminants or have given rise to autogenous infection. . . . There are no reports of extensive series of postoperative or post-traumatic pneumonias in which adequate bacteriologic studies, including complete and accurate pneumo-

coccus typing, have been carried out. The results of specific therapy are, therefore, difficult to evaluate. . . . The present paper contains an analysis of 279 cases of postoperative and 92 cases of post-traumatic pneumococcic pneumonia that occurred at the Boston City Hospital between Sept. 1, 1929 and July 1, 1940. . . .

“The effect of various types of anesthesia on the incidence of postoperative pneumococcic pneumonia was analyzed for a two and one-half year period. For this purpose all operations in which general inhalation anesthesia had been employed were considered together and, for better comparisons, the tonsillectomies, almost all of which were done under light anesthesia with ether, were excluded. . . . There was little difference between the incidence after spinal and after inhalation anesthetics. Local anesthetics, which were associated with the lowest incidence of pneumonia, were used primarily in brief or minor operations and rarely in general surgical operations on the abdomen. . . . Operations on the upper part of the abdomen and the head, neck and lungs were the longest operations and were accompanied by the greatest incidence of postoperative pneumonia. Robertson, in producing experimental pneumonia in dogs by the intrabronchial injection of pneumococci in starch suspensions, found that pulmonary consolidation could be established much more regularly in animals that had been given a preliminary injection of morphine. This drug and other sedation were used in almost every instance both preoperatively and postoperatively in the present cases, particularly in those groups of cases in which pneumonia was most frequent. . . .

“Interference with respiration appeared to be the most important single factor in the occurrence and localization of the pneumonia in both these groups of cases. The postoperative