

catheter is advocated as a simple, safe and effective means of reducing postoperative pulmonary complications caused by retained secretions. The catheter is inserted through the cricothyroid membrane by means of a 17 gauge needle and left in place for periods of time up to several weeks with no discomfort to the patient. The method is useful in patients who cannot or will not cough voluntarily. However, no data are presented on results in the 200 patients so treated, other than to state that complications due to the method were absent. (Myers, R. N., Shearburn, E. W., and Haupt, G. J.: *Prevention and Management of Pulmonary Complications by Percutaneous Polyethylene Tube Tracheostomy*, *Amer. J. Surg.* 109: 590 (May) 1965.)

INFANT TRACHEOSTOMY By comparing the findings in 62 infants receiving tracheostomy in the period from 1936 to 1953 with those of 86 during the period from 1954-1963, a clear-cut trend was away from the operation for acquired inflammatory lesions and toward operation for congenital malformation and neoplasms of the airway, with an overall increase in total incidence in recent years as indications have broadened and skepticism for the procedure lessened. Morbidity associated with the procedure has been lowered through improved surgical techniques, including preoperative establishing of a patent airway by means of a bronchoscope to avoid emergency tracheostomies, and better postoperative management. Complications do still occur and the most common continues to be delayed extubation due to a variety of causes such as granuloma formation, stenosis of trachea or larynx and vocal cord paralysis; acquired inflammatory disease seldom leads to this difficulty. (Holinger, P. H., Brown, W. T., and Maurizi, D. G.: *Tracheostomy in the Newborn*, *Amer. J. Surg.* 109: 771 (June) 1965.)

INTERSTITIAL FLUID PRESSURE Pressure-volume curves of interstitial fluid spaces were determined in anesthetized dogs by sampling of pressures in subcutaneously implanted perforated capsules. Pressures within these capsules were recorded by means of inserting into them a needle attached to a Statham pressure transducer. Intracapsule

pressure was assumed to be equal to interstitial pressure. Control interstitial pressures were found to be in the range of minus 4 to minus 9 mm. of mercury in both awake and anesthetized dogs. However, persistent immobilization of the animals led to a gradual pressure rise toward zero of about 1 mm of mercury per hour, which trend reversed rapidly with reinstitution of activity. By means of appropriate fluid administration in both isolated limbs and intact animals, pressure-volume curves were constructed, indicating very low compliance of the interstitial spaces so long as the capsule pressure was in the negative pressure range but a many-fold increase in compliance once ambient pressure was exceeded. These findings explain the "safety factor" which protects against early development of edema, since even in the presence of a low plasma protein oncotic pressure there must be a concomitant large rise in normally negative interstitial pressure (about 7 mm. of mercury increase) before the tissues begin to collect appreciable volumes of fluid. Once this critical point is reached, edema fluid forms rapidly and in large amounts. (Guyton, A. C.: *Interstitial Fluid Pressure: II. Pressure-Volume Curves of Interstitial Space*, *Cir. Res.* 16: 452 (May) 1965.)

PULMONARY SHUNTING Large physiologic shunts resulting in hypoxemia were found in all patients breathing air 20 to 24 hours after cardiac surgery. The average shunt on 100 per cent oxygen was 13 per cent of cardiac output. The most important single cause of these shunts was diffuse atelectasis, usually not visible on roentgenograms. Extracorporeal circulation had no apparent effect in increasing physiologic shunting. The increase in shunting on room air, as compared with oxygen, was significant in the group of patients who had mitral valve replacement or open mitral valvuloplasty. This shunting caused by uneven distribution of ventilation in relation to perfusion, was equivalent to a right to left shunt of 12.5 per cent of the cardiac output. The combination of atelectasis and maldistribution resulted in the mean arterial oxygen tension on air of this group being only 53 mm. of mercury. (Hedley-Whyte, J., and others: *Pulmonary Ventilation-Perfusion Relations After Heart*

Valve Replacement or Repair in Man, J. Clin. Invest. 44: 406 (Mar.) 1965.

PULMONARY SURFACTANT Current evidence indicates that the surface tension of the alveolar lining varies with change in area. The alveoli presumably do not collapse at the end of expiration because of the low surface tension of pulmonary surfactant. The prediction is made that if surface tension is high due to an abnormal surface or if the distending pressure is low, focal atelectasis can be expected. Occasional increase in surface area occurs normally with a deep breath. This variation in respiration apparently is necessary to maintain normal function of pulmonary surfactant. Continued shallow breathing with a low distending pressure leads to damage of the quality of pulmonary surfactant with the eventual result of atelectasis. This atelectasis is not due to airway collapse and does not need to follow the distribution of a bronchus. (*Tierney, D. F.: Pulmonary Surfactant in Health and Disease, Dis. Chest 47: 247 (Mar.) 1965.*)

ACETYLCYSTEINE Clinical response of 16 children with cystic fibrosis treated with acetylcysteine aerosol as measured by changes in vital capacity, blood pH P_{CO_2} , and oxygen saturation indicated that the most severe group had only a short initial response. There was no significant alteration in the basic disease process. A more beneficial response was demonstrated in the less severe group in which a better pulmonary status of the patients was maintained. (*Stamm, S. J., and Doctor, J.: Clinical Evaluation of Acetylcysteine as a Mucolytic Agent in Cystic Fibrosis, Dis. Chest, 47: 414 (Apr.) 1965.*)

PULMONARY EDEMA Pulmonary edema was induced by intravenous infusion of dextran in anesthetized dogs. Surface tension properties were measured on saline extracts of lungs. Pressure-volume relations were determined in excised lobes and compared with normal controls. Dark atelectatic portions of edematous lungs showed significantly increased maximal and minimal surface tension and significantly decreased extract stability index. When edema was induced in degassed, nonventilated lung

and no foaming occurred, surface properties were abnormal, but less so than in lung permitted to foam. Edematous lung lobes showed a significantly reduced expansion index relative to normal lobes. Pulmonary edema leads to regional impairment of pulmonary surface activity, associated with premature alveolar closure. The mechanism of altered surface activity was not explained fully. Foaming was an important, but not essential, factor. (*Said, S. I., and others: Pulmonary Surface Activity in Induced Pulmonary Edema, J. Clin. Invest. 44: 458 (Mar.) 1965.*)

COLLATERAL VENTILATION Collateral ventilation, the passage of respired gases between contiguous segments within a lung lobe, is increased when the tidal volume is increased and the respiratory rate slowed. Histamine reduced collateral ventilation. Serotonin given intravenously produced no changes. Acute surgical ligation of the pulmonary artery branch to the lobe under study sharply reduced collateral ventilation. Acute surgical occlusion of the lobar pulmonary vein reduced collateral ventilation slowly and progressively, with rapid reversal when the occlusion was released. (*Call, E. P., and others: Some Physiologic and Pharmacologic Aspects of Collateral Ventilation, J. Thor. Cardio. Surg. 49: 1015 (June) 1965.*)

EMPHYSEMA Resection or surgical obliteration of large emphysematous bullae affords relief in a high percentage of patients. There must be strict criteria for the choosing of surgical candidates. A large stationary bulla of at least one-third the size of the hemithorax, or an expanding bulla accompanied by increasing dyspnea are the most common indications. Preoperative regimen includes seven days of expectorant therapy and intermittent positive pressure breathing treatments. The most important and informative preoperative procedure is a pulmonary angiograph. (*Joannides, M.: Chronic Obstructive Emphysema, J.A.M.A. 192: 365 (May 3) 1965.*)

PROLONGED APNEA A 70 year old man with jaundice and choledochal carcinoma underwent uneventful ether anesthesia with succinylcholine 160 mg. and *d*-tubocurarine 9 mg.