

away from the horizontal by elevating the foot of the tilting x-ray table. All of the fluid in the lumbar portion of the spinal canal is then replaced with air or oxygen. Usually about 40 cc. of fluid in addition to what was collected for a specimen is obtained. We usually inject an additional 10 to 20 cc. of air but this should not be under undue pressure. Approximately 50 to 60 cc. of air is necessary to get a satisfactory filling of the lumbar subarachnoid space."

"While the head is still low and after the lumbar puncture needle has been removed and the puncture wound has been sealed with sterile cotton soaked in collodion, stereoscopic lateral roentgenograms are made. . . . The patient is then returned to his bed and is advised to keep his head low for 24 hours, during which time he receives inhalations of oxygen, by mask in order to promote more rapid absorption of the air."

"... The anesthetic agent most commonly employed is drop ether. The patient is anesthetized by a combination of nitrous oxide and oxygen, and then drop ether is substituted. Some of the surgeons at the clinic prefer to have a McGill intratracheal tube introduced after the patient is asleep and then drop ether is administered over the outer end of the intratracheal tube. If the patient has recovered recently from an infection of the upper part of the respiratory tract or there is any question regarding the advisability of using an inhalation anesthetic agent, such as ether, the operation may be performed while he is under spinal analgesia or under the influence of intravenously administered pentothal sodium. The latter anesthetic agent is particularly useful for persons who are unduly nervous, for those who have severe hypertension, and for those who have asthma or hay fever." 12 references.

A. W. F.

WASSERMAN, L. R., AND STATS, D. *Clinical Observations on the Effect of 3,3'-Methylenebis (4-Hydroxyycoumarin)*. Am. J. M. Sc. 206: 4 (Oct. 1943).

"During the last few years, the clinical use of anticoagulants has greatly increased due in large part to the preparation of a non-toxic heparin and to the excellent clinical and laboratory studies of intravascular thrombosis and embolism."

"Widespread use of heparin in the therapy of these conditions has been limited by great expense and difficulty of administration of the drug; it must be given intravenously either in a continuous infusion or by injections 3 or 4 times daily.*

"Investigations with actions of 3,3'-methylenebis (4-hydroxyycoumarin) in laboratory animals have shown a prolongation of the clotting time and a reduction in prothrombin activity of the blood. . . . In these studies we have considered a satisfactory response to the dicoumarin to be an increase in the clotting time of the whole blood to between 15 and 20 minutes and a fall in the prothrombin index of the plasma to between 30 per cent and 50 per cent."

Prothrombin Index per cent =
$$\frac{\text{Control plasma time (seconds)} \times 100}{\text{Pathologic plasma time (seconds)}}$$

At the same time there must not be undue toward toxic effects, i.e. hemorrhagic manifestations.

"... In general, the plan of dosage was directly dependent upon the individual responses of the prothrombin index. The drug was given if necessary in daily doses of 200 to 500 mg. The drug was given in some cases when the prothrombin index was as low as 40 per cent. Our most recent

* Since this manuscript was submitted, Loewe and Rosenblatt have reported on a satisfactory technique for the use of heparin by the subcutaneous route.

experience, however, is such that dicoumarin is not administered whenever the prothrombin index is less than 50 per cent."

"... A single dose of 400 mg. is usually effective in producing the desired response."

"... In two cases transient cramp-like abdominal pain and mild diarrhea occurred a few hours after the injection of the drug."

"Liver function tests such as the cephalin flocculation test, hippuric acid excretion test, bromsulphalein test, icterus index, and galactose tolerance test were performed in cases showing toxic effects. No interference with liver function could be demonstrated. Vitamin K had no effect on the circulating prothrombin or on the bleeding tendency. . . . Though parenteral administration of Vitamin K will restore the prothrombin to normal level in obstructive jaundice it has no effect upon the reduced prothrombin brought about by dicoumarin."

"Our experiences with the drug have led us to employ it in clinical states in which a disturbed coagulability of the blood might be of value. Because of the previously described latent period (24 to 72 hours) after the oral administration of the dicoumarin, we and others have given heparin by the continuous intravenous route until the dicoumarin effect became apparent. At this time a marked fall in prothrombin actively occurred. Heparin was then discontinued and repeated doses of the dicoumarin were prescribed. . . .

"... The individual variation of different patients is so great that a workable dosage schedule for administration cannot be definitely formulated. . . . The variability of the effect of dicoumarin and the inability to predict its action greatly lowers its possible usefulness in such conditions. . . . Despite daily determinations of the prothrombin level of the blood and the fitting of each dose of the dicou-

marin to the preceding prothrombin determination, we have not always been able to maintain the lowered level evenly."

"We have observed postoperative bleeding in many cases when dicoumarin was administered either before operation or shortly thereafter. We have also noted a tendency to hemorrhage in any patient receiving dicoumarin in whom an unrelated lesion that might bleed was present. Examples of this include bleeding into the skin in case of eczema, bleeding from the kidney in a patient with a renal calculus, bleeding from ulcers of the extremity, thromboangiitis obliterans, and bleeding into the pleural cavity following pneumothorax in a case of pulmonary tuberculosis. In regard to operative procedures, hemorrhage at the time of operation may occur only in patients who received the dicoumarin several days previously. If the drug is given on the day of operation there is no such risk. However, in such cases secondary hemorrhage may occur early in the postoperative course when sutures, drains, and packings are disturbed. Bleeding in all these instances occurred when the prothrombin was less than 20 per cent of the normal."

"The 10 cases of occlusive peripheral arterial disease were carefully studied for three months. During this period the patients were ambulatory and were examined every other day. Dicoumarin was administered whenever the prothrombin level was above 60 per cent. Except for slight improvement in an ischemic ulcer of the foot, no beneficial effect of the drug could be observed. There was no essential change in the degree of intermittent claudication or coldness of the extremities in any of these cases during the period."

"The prothrombin and coagulation levels at which bleeding is likely to occur seems to be between 20 per cent and 5 per cent for the former and over

25 minutes for the latter. . . . The hemorrhagic tendency, once developed, is likely to persist until the prothrombin index rises to 30 per cent or more and the coagulation time falls below 20 minutes."

"Four cases received repeated transfusions of fresh blood in an effort to elevate the circulating prothrombin and diminish the bleeding tendency. In none of these instances were dramatic effects observed, and we believe that bleeding ceased only after the dicoumarin effect had worn off and the prothrombin level had become elevated. In those cases it was apparent that transfusions served only to maintain the hemoglobin level and had but little effect on the cessation of bleeding."

"The following therapeutic plan for prolongation of blood coagulability with 3,3'-methylenebis (4-hydroxy coumarin) may be found useful in certain instances. It is our present procedure to administer orally as the first dose 300 mg. to a patient weighing 130 pounds or less, or 400 mg. to one weighing over 160 pounds. On the second day an additional 200 mg. is sometimes given. The subsequent doses will depend upon the results of the coagulation and prothrombin tests. It is imperative that prothrombin tests be performed daily. If no effect is observed by the third day, a dose of 300 mg. may be given. If a marked effect is observed, however, further administrations of the drug are withheld. Repeated doses, as much as 300 mg. or more daily, may be required in resistant cases." 18 references.

A. W. F.

MOLONY, C. J.: *Postoperative Pulmonary Collapse in Childhood*. *Am. J. Dis. Child.* 66: No. 3 (Sept.) 1943.

"Atelectasis may be defined as an airless state of the lungs; originally coined to refer to the variety found in newborn infants, the word now com-

monly denotes any collapse of the alveoli, no matter what the cause. Atelectasis was first described satisfactorily by Gairdner, who in a series of papers from 1850 to 1853 carefully differentiated it from pneumonia both grossly and microscopically. Moreover, he laid down the principle that in most cases, both in adults and in children, it is secondary to bronchial obstruction from secretion. It is extremely interesting to note that this first real description of the condition and its cause is in complete agreement with the most widely accepted views today."

". . . In most large hospitals where pneumonia formerly was the common diagnosis in thoracic complications following an operation, now atelectasis is the more common by a ratio of 3 to 1."

". . . There is much evidence to support the idea that almost all so-called postoperative pneumonias are secondary to an initial collapse. In a children's hospital there is a much smaller incidence of postoperative collapse than in a hospital for adults because surgical intervention in the upper part of the abdomen is not as frequent and because children are not kept as immobilized and as narcotized as the elders."

"The diagnosis of postoperative atelectasis is based on the rather sudden onset of cough, fever and dyspnea in a child who has been operated on day or so before. There are suppression of breath sounds, dullness, usually rales and usually signs of consolidation over the involved area of the lung, and by its sounds and appearance the heart seems to be shifted to the involved side. The roentgenogram shows a shadow corresponding to a collapsed lobe or to the collapsed lobes; the leaf of the diaphragm is high on the involved side and usually the heart is shifted toward the side of the collapse. Collapse of the upper lobe may or may not pull the heart toward the lesion."