

service mostly in the late teens and twenties, although some were in the fourth, fifth, and sixth decades. . . . The technic of local injection has been described by Leriche and others. Fracture is excluded by radiographic study. The sprained ligaments indicated by tender points are determined by palpation. An antiseptic is then applied to the skin. Two per cent procaine hydrochloride solution without epinephrine is used routinely and with it a wheal is made in the skin over the site of injury with a fine needle. The latter is replaced by a larger needle and the underlying injured ligament is injected. All tender points, whether proximal, distal or intervening portions of the ligament, are injected. A search is then made for tender areas in other ligaments and these are each carefully injected until no tender or painful areas remain either with palpation or ankle and foot motion. The amount of procaine solution varies from around 10 to 20 cc. There is no hesitancy to use an ounce or more if necessary. Next an elastic bandage is wrapped snugly around the ankle, and the patient is requested to walk around the room. If any pain is experienced, further injection is done. The patient is then returned to activity with instruction to use and move the foot and ankle normally, except for running and jumping. Also it is stressed that while sitting as at a desk or table, the foot should be moved and not kept immobile in one position even for short periods. The elastic bandage is to be removed and rewrapped by the patient in one to two hours to prevent possible circulatory constriction. Daily and periodic return for check-up is required in all cases. . . .

"Irrespective of the type of treatment, patients who returned immediately to normal activity and used and moved the foot and ankle improved much more rapidly than those who did

not. Injection with 2 per cent procaine hydrochloride solution into the injured ligaments followed by normal activity gave uniformly the best results. These patients, following complete elimination of pain and tenderness by injection continued immediate use of the part, avoiding only especially strenuous activity as hard running or jumping." 7 references.

J. C. M. C.

BARBOUR, J. H., AND SEEVERS, M. H.: *Narcosis Induced by Carbon Dioxide at Low Environmental Temperatures*. J. Pharmacol. & Exper. Therap. 78: 296-303 (July) 1943.

"The total oxygen consumption of the albino rat is reduced significantly when this animal is placed suddenly in an atmosphere containing 10% CO₂. It is difficult to determine by observation alone whether or not a parallel decrease in the total body activity of the animal occurs since the hyperpnea is so marked as to obscure any manifestations of depression. In normal man, unconsciousness usually occurs at this level of CO₂ in spite of the dyspnea, indicating that some structures within the nervous system are depressed. Since it is of some theoretical, as well as practical interest to know whether or not this and lesser concentrations of carbon dioxide exert a depressant action, the following experiments have been undertaken. They have been based on the fact that even minor grades of depression reduce the capacity of an animal to adjust itself to a cold environment. The results obtained, even with the lower concentrations of CO₂, were so striking that parallel experiments have been made with other agents in order to determine, if possible, the relation of the phenomenon to total oxidative metabolism. . . . A reversible state of narcosis having certain characteristics of both hibernation and anesthesia may

be induced and maintained for many hours in the rat and dog by sudden exposure at 5° C. to concentrations of CO₂ of 5 per cent or greater. In this state the rat has a body temperature of 16–20° C., a heart rate of 30–100 per minute, and a respiratory rate of 1–20 per minute. When the rat is respiring 11% CO₂ at 5° C. the CO₂ content of the blood may reach 110 volumes per cent and the plasma pH a level of 7.07. A similar state may be induced in the rabbit by 20% CO₂ and cold but it is not reversible because of the fatal pulmonary edema. Rats are rendered more susceptible to this state by fasting, prolonged (three weeks) exposure to 10% O₂, or by administration of small doses of depressant drugs. Repeated narcotization by this method at intervals of several days; acclimatization to cold or to CO₂ for several days; or previous thyroid feeding; renders the rat partially or completely resistant to the narcosis induced by 11% CO₂ at 5° C. A state of depression somewhat similar to, but not identical with, that described above may be produced in rats by exposure to low oxygen tensions (10%) or to high oxygen tensions (4 atmospheres) at an environmental temperature of 5° C. It is believed that these experiments furnish additional evidence to support the view that a sudden and well marked increase in the tissue tension of CO₂ produces a definite, if temporary, decrease in the total oxidative metabolism and a parallel reduction in activity of certain body tissues including some portions of the nervous system." 16 references.

J. C. M. C.

COLE, W. C. C., AND KIMBALL, D. M.: *Relationship of Maternal Ether Anesthesia to Inauguration of Fetal Respiration*. Nebraska M. J. 28: 200–203 (July) 1943.

"About three years ago we reported our observations on a series of 5,000

consecutive newborns in which we attempted to analyze the importance of the various factors which may tend to produce asphyxia. We discovered that one of the most important factors lies within the fetus itself—premature and immature babies increase in their susceptibility to asphyxia in direct proportion to the degree of immaturity. . . . From this study we also learned that anesthetics given to the mother are an extremely important factor in the production of asphyxia in the baby. . . . All children have a much narrower margin of safety than adults; and besides this, the fetus normally operates on a much reduced oxygen level, consequently what is only a safe surgical anesthetic for the mother, may be too deep an anesthetic for the baby. This observation was so striking that we determined to study further the effects of anesthesia in an additional group of cases. . . . We have collected data on an additional 2,000 cases in which not only the duration but the degree of anesthesia was carefully ascertained. This study involves only the use of ether anesthesia. . . .

"There were only eighteen mothers in this series who received no anesthetic whatever. . . . All of these babies breathed in less than one minute. 910 mothers received only first and second stage anesthesia without regard for the length of time. Some were only a few minutes. Many were for long periods. In this group, 68 per cent breathed in less than thirty seconds and 86 per cent in less than one minute. Only 4 per cent took longer than three minutes. 303 mothers received, in addition to whatever first and second stage anesthesia they may have received, up to five minutes of third stage anesthesia. The babies that breathed in less than thirty seconds have dropped 10 per cent. Mild asphyxia has increased from 10 to 16.5 per cent, and severe asphyxia has increased from 4 per cent to 5.6 per cent. In 285 cases, the third