the breast. It is based on a comparative study of two groups of cases. The first group consists of four radical mastectomies performed under Pentothal Sodium alone. The second group consists of six radical mastectomies performed under Pentothal Sodium and supplemental intercostal novocain block. . . . All novocain blocking is carried out by the surgeon via a transincisional approach after the incision has been made. By this method the surgeon may place the novocain solution strategically, precisely and visually. . . . The patient is carried into a light third stage of surgical anesthesia with Pentothal Sodium, which permits a skin incision to be made. In this study the drug was administered in a 1 per cent solution according to the fractional drip method. . . . With the fingers of the left hand identifying each rib successively from the eighth or ninth upward to the fourth, a needle is advanced under the lower border of each rib until it penetrates the compartment between the external and internal intercostal muscles in which each intercostal nerve runs, and here 2 or 3 cc. of a 1 per cent solution of novocain is deposited. The axilla is then dissected sufficiently to expose the upper four ribs and to identify and protect the axillary vessels and nerves, following which the four upper intercostal nerves are similarly novocainized. The deposition of novocain should be made posteriorly to the midaxillary line, which is the point of emergence of the lateral cutaneous branches of the intercostal nerves. . . . The mastectomy may then be completed with need of but little more Pentothal Sodium. . . . A comparable sharp reduction in the rate of utilization of the drug during radical mastectomy for cancer of the breast followed the supplemental use of intercostal nerve block." 2 references.

J. C. M. C.

HAMBURGER, E.; HIMWICH, W. A.; ETSTEN, B.; YORK, G.; MARESEA, R., AND HIMWICH, H. E. *The Effect of Pentothal Anesthesia on Canine Cerebral Cortex.* Am. J. Physiol. 147: 343 (Oct.) 1946.

Barbiturates are known to reduce the oxygen intake of excised cerebral tissues. It was noted that higher parts of the brain are depressed to a greater degree than the lower portions by pentobarbital.

An indirect method to measure cerebral blood flow was used in seven dogs. Determinations were made at two depths of pentothal anesthesia; one in which anesthesia was the lightest possible that would permit manipulations and another in which noxious stimulation evoked no apparent response.

The effect of light pentothal narcosis was compared with that of deep anesthesia and the average oxygen intake in the brain was found to fall from 5.9 cc. oxygen per 100 grams of tissue per minute to 2.6 cc. oxygen per 100 grams of tissue per minute, a decrease of 56 per cent. The cerebral metabolic rate is higher than that obtained from the brain of man and monkey using the same methods, and the difference is imputed to the fact that in the dogs the venous blood came chiefly from the cerebral hemispheres which possess a faster metabolism than the lower parts of the brain.

M. F. P.

HURLEY, G. A. P.: *Regional Anesthesia: Its Advantages in Emergency Surgery of the Extremities.* Am. J. Surg. 72: 219–228 (Aug.) 1946.

"In this article, it is proposed to point out some of the advantages that pertain to the use of regional anesthesia in particular as it applies to the emergency surgery of the extremities. . . . The flooding of the tissues and

consequent opening up of the tissue spaces by the anesthetic fluid in the region of infection or contamination (as in the case of a dirty wound), is believed by many to favor spread of infection or contamination to hitherto unaffected parts of the anatomy. . . . No such objection exists to injection of the brachial plexus through the skin of the supraclavicular fossa, which, being remote from the injured area, can be scrubbed as thoroughly as necessary. . . . In this account which deals only with the surgery of the extremities, two regions will be dealt with specifically: (1) the upper extremity distal to and including the shoulder joint, and (2) the lower extremity distal to and not including the knee joint. For (1), block of the brachial plexus in the supraclavicular fossa is usually adequate. . . . For (2), block of the great and small sciatic nerves in the gluteal region is adequate usually. . . . A combination of barbiturate (nembutal) and morphia has been found to be the most satisfactory premedication. . . . The actual technic of the injection is best learned through a period of preliminary training under supervision on the living subject, or without supervision on the cadaver. There are certain inherent dangers in plunging a needle deeply into almost any part of the body, and the operator must know the dangers and how to avoid them. . . . The most valuable guides by which one's path is directed in deep injections are constituted by the landmarks, superficial and deep, presented by certain parts of the bony skeleton. The superficial landmarks are those prominences easily palpable and occasionally visible which lie in the immediate neighborhood of the field of injection. Perhaps more important are the deep, bony landmarks which are not always palpable and never visible, but which can be sought out by the exploring needle point. . . .

"Apart from the care needed to be taken with the actual injection, the surgeon operating with this method of anesthesia must of necessity be as gentle and painstakingly accurate in his movements as is humanly possible. . . . A practice must be made of checking on the adequacy of the preliminary medication shortly before the block injection is begun. Should the required state of oblivion be not attained at this time, the operation should not be be proceeded with at once. An additional dose of morphia should be given. . . . Another factor of considerable importance is constituted by the patient's immediate surroundings in the operating room. The whole atmosphere of the place must be as tranquil and quiet as possible. . . . Fifty-one patients were operated upon. . . . In the brachial plexus block series there were three groups: (1) Eight upper arm cases. . . . (2) Eight forearm and wrist cases. . . . (3) Fifteen hand cases. . . . In the sciatic block series there were seventeen reductions of fracture dislocations of the ankle. . . . There were also four reductions of fractured tibia and fibula, two wound excisions and reduction of compound fractures of tibia and fibula (sciatic block combined with long saphenous nerve block), and one wound excision and reduction of compound fracture dislocation of ankle and reduction of fractured tarsal scaphoid, cuboid, and three cuneiform bones. . . . The only organic complications that resulted in the brachial plexus block series were localized gangrene of fingers in two cases, of skin of dorsum of hand in one case, and osteomyelitis of ring finger in the case of suppurative tenosynovitis. These all occurred in the hand group and it is believed that they could not be attributed fairly to the method of anesthesia used. In the case of removal of foreign body from the left upper arm the patient complained

shortly after the operation that he could not move any part of his left upper extremity. He was seen by Dr. F. H. McKay (Dept. of Neurology) who found 'all sensations present in the left upper extremity with complete motor loss in hand, wrist and forearm, the only exception being a flicker of movement in thumb flexion.' He suggested that 'an organic basis due to compression from a very tight tourniquet (applied before admission to check bleeding from the left basilic vein) might be held responsible but that nevertheless a large functional (suggestive) element must be present.' All muscles of the left upper extremity responded well to Faradism and there was no reaction of degeneration. Function quickly returned to this patient and within months he was working full time again. . . .

"In the sciatic block series there was one case of osteochondritis dissecans of the ankle which gave an excellent final result after removal of the loose fragment of bone and cartilage. Another case of fracture dislocation of the ankle suffered re-dislocation due to too early unsupported weight bearing. This patient, a luetic, had a fair final result after reconstruction of the ankle joint. Suppurative arthritis occurred in a case of simple fracture dislocation of the ankle. The reason for this complication was unknown and a fair final result was achieved after ankylosis of the joint. In a case of spiral fracture of the tibia and fibula gangrene of the lower leg and foot occurred postoperatively necessitating amputation seven inches below the knee. The gangrene here was attributed to traumatic spasm of the popliteal artery and its collaterals. It is not believed that any of these complications could with fairness be attributed to the nerve block. As regards the degree of anesthesia obtained, it was complete in all but five cases of the Brachial series. . . . In the sciatic block cases, slight complaints were registered in 5 cases, all during the manipulation of the fractured bone ends into position. As soon as the manipulation had ceased there was no further complaint. This leads one to suspect that the cause of the complaints might well be the feeling of crepitus which, though unpleasant, is not painful. . . . It is probable that heavier sedation in these cases would have completely eliminated the slight complaints noted."

J. C. M. C.

McLAUGHLIN, C. W., JR.: *Novocain Infiltration in the Treatment of Acute Ankle Injuries Without Fracture.* Surgery **20**: 280–283 (Aug.) 1946.

"In a previous communication, I reported the results of procaine injection therapy in a series of acute ankle injuries without fracture observed aboard a carrier during World War II. This series has been subsequently increased to sixty-nine cases, and these form the basis of this report. Sixty-five of the sixty-nine patients were seen in an average period of ten hours after their injury occurred. . . . The initial injection of procaine gave an excellent result in fifty-six cases, or 86 per cent, of the series. These men all returned to full work immediately, remained free from pain, and experienced no subsequent disability. One patient obtained only a fair result, graded at 50 per cent improvement. He was subsequently treated by a supportive dressing and within three days all symptoms had disappeared. The remaining eight patients all received immediate relief following injection, but there was a recurrence of the initial pain and disability in from four to twelve hours. All of these patients originally complained of severe or very severe pain, and five were in the group with bi-