nerves is obtained. Postoperatively, there are no gastrointestinal upsets due to anesthesia, and large amounts of sedation are not necessary. Drainage is promoted because agglutination is delayed, and the danger of embolism is greatly diminished. Because of these factors this method is especially useful in the aged, in patients with toxic, gangrenous and diabetic conditions with arteriosclerosis, and in those suffering from severe trauma with shock.

... [Three] cases demonstrate well the advantages of this type of anesthesia. In ... two diabetic patients no interruption of the regimen was necessary. ... Anesthesia was successfully obtained in each case. There was lack of any evidence of shock. Infinitesimal loss of blood occurred, and quick recovery followed the operation. In 2 of these cases infection of the wound followed the amputation. ... It is not believed that infection in these cases can be attributed to the form of anesthesia.” 43 references.

J. C. M. C.


“The purpose of this paper is to discuss the subject of refrigeration amputation as applied to cases exhibiting severe peripheral vascular disease of the lower extremity with gangrene, to summarize the experience gained by the surgical staff of the Wisconsin General Hospital in using this technic and to present certain new concepts and modifications suggested by the knowledge so obtained. ... Our initial attitude was skeptical; consequently, refrigeration was first applied to a patient in whom, because of his extremely poor condition, no other therapy seemed to present any reasonable chance of success. ... The remarkable survival in this severe case served to increase our interest in, and respect for, the refrigeration method. In the period from June, 1942, to September, 1943, the method has been used in 20 additional instances. Statistics reveal that all of these patients were poor risks, all had established gangrene, 66 per cent has gross infection and general sepsis, 61 per cent were diabetic, and the average age was 68 years. In a group of patients with such an obviously poor prognosis, it is noteworthy that there were only 3 deaths, 2 of which we do not feel were attributable to the method. The 1 admitted fatality was due to a gas gangrene infection of the stump. ... In contrast to the low mortality encountered, morbidity was high. There were 6 transient genito-urinary infections. Two patients developed gas bacillus infections, one of which apparently was true gas gangrene, and accounted for a death. The other cleared with conservative treatment and exhibited a good end result. There was one patchy bronchopneumonia, which readily responded to sulfonamides. One small pulmonary infarction occurred which resolved without further difficulty. Five stumps failed to heal primarily due to insufficient blood supply at the level selected for amputation. ... It is believed that many of these transient complications can be eliminated by more careful attention to technic. ... There are two types of refrigeration; namely, Control Refrigeration and Surgical Refrigeration. These may be used singly or in combination. Proper use of these different technics will give best results. The level of amputation should be carefully determined prior to inauguration of treatment. This level should rarely be below the knee.” 40 references.

J. C. M. C.


“In a preliminary report we described our modification of the original
technic of fractionally continuous caudal block analgesia in obstetrics, as advocated by Hingson and Edwards. Instead of administering repeated injections, we set up a continuous infusion drip after the effect of the initial dose has been established. Since our preliminary report we have analyzed 130 cases of caudal block performed between November, 1942, and May, 1943; of these, fifty were single injections, twelve were of the fractional type and sixty-eight were continuous drip infusions. We follow the technic described in our preliminary report except that we have cut the 19G needle to a length of 2½ inches, which insures its being buried up to the hilllock. If a portion of the needle is left outside the skin, the possibility exists that the needle may be accidentally and unknowingly pushed further into the caudal canal during the drip infusion, and that it may then insidiously pierce the dura mater. This contingency is eliminated by our revised technic. A safer method is the catheter technic independently described by Manalan, and Adams, Lundy and Seldon. The reasons for discontinuation of a successful caudal block before delivery were: no attendant to watch overnight two, unsuccessful manual dilation for a partially dilated cervix one, procaine excitement three, nembutal excitement one, suspected cephalopelvic disproportion one, patient not in labor one, patient's request one, needle out of place two, blocked needle one, leak in rubber tubing one, excessive fall in blood pressure one, severe pain in legs one, excessive vomiting one. Ninety-seven cases were wholly successful. In nineteen cases block, though effective, was discontinued before delivery, and in fourteen cases there was complete or partial failure or the dura was penetrated. The operative procedures and deliveries included four precipitate and thirty-four spontaneous deliveries, fifty-one low forceps, twenty mid forceps, three breech extractions, two uterine tamponades, two abdominal sterilization and one low flap cesarean section. The amount of 2 per cent procaine required for full initial effect was usually 45 cc., and of 1½ per cent metycaine 30 to 35 cc. Full initial effect was obtained within fifteen minutes in the majority of the cases, and within five minutes in one-half the cases. Thirteen cases were refractory, that is, the usual initial dose produced only a partial effect. It is the occasional refractory case with its additional time requirement that makes caudal block unreliable for abdominal surgery, particularly in a busy operating room running on schedule. We did, however, perform a successful cesarean section under caudal, with surprisingly small loss of blood. There is definite softening and relaxation of the cervix, palpable even on rectal examination. The uterus is not affected; contractions are therefore unchanged, as we have found. Due to this lack of relaxation, version under caudal block is undesirable and breech extraction is preferable under general anesthesia. There is an apparent shortening of the first stage of labor. A gradual increase, however, was observed in the total duration of the first stage the later caudal block was instituted. The average duration of the second stage was one hour and sixteen minutes for twenty-four primiparas, and fifty-six minutes for twenty-five multiparas. The large number of forceps deliveries, many of which were prophylactic, must be considered when one weighs these figures. Caudal effect after discontinuation of continuous drip or after single injections persisted for an average of one and one-half hours in sixty cases. The variation was from fifteen minutes to three hours, with the majority at one hour. Temporary motor paralysis of the lower extremities was noted in thirteen cases.

"It usually lasted about one-half to
three-quarters of an hour, duration being roughly correlated with the persistence of caudal effect after discontinuation of the drip. Observations in most cases were consistent with the interpretation that paralysis is an early sign of overdosage or a result of prolonged continuous block. Among the forty-nine cases in which blood pressure was carefully watched, thirty-one showed some depression; in eighteen cases the systolic fall was at least 20 points. One three pound infant was stillborn. [In one case] both mother and child died. The accidental pushing of the needle too far into the caudal canal when the patient moved was, we believe, responsible for her death. Other complications included nine cases of excitement and disorientation, ten of nonuterine pain, four of chills, five of burnings, eight of nausea and/or vomiting, three of dizziness, one of an uncontrollable desire to defecate, and two of unilateral anesthesia of the perineum. Any method which produces such complete and dramatic obstetric analgesia cannot be dismissed because of certain disadvantages and inconveniences to the physician. The disadvantages may in time be eliminated by continual modification of technic. Although continuous caudal analgesia is still in an experimental stage, we maintain confidence in its eventual destiny as an addition to our obstetrical armamentarium. In its present state, however, its inherent disadvantages obviate its universal use, and thus preclude its acceptance as the long awaited panacea.” 7 references.

J. C. M. C.


“We have used continuous caudal anesthesia in our clinic [Section of Obstetrics of the Surgical Service of Brooke General Hospital, Fort Sam Houston, Texas] since August, 1942. Since that time we have managed 1,500 cases using this technic. . . . Three types of solution were used: Procaine hydrochloride 1.5 per cent, 900 cases; metycaine 1.5 per cent, 500 cases; pontocaine .25 per cent, 100 cases. These solutions were prepared using normal saline as the diluent. In this series, 1,236 cases were managed without any other type of analgesia except barbiturate premedication. In 192 cases it was necessary to supplement caudal anesthesia with other analgesics such as morphine and hyosine and the barbiturate in the first stage of labor. In these cases, caudal anesthesia was used only for the terminal portion of the first stage and for delivery. . . . Thus, 1,428 cases were delivered successfully under caudal anesthesia without any supplemental anesthesia at the time of delivery. In the remaining 72 cases caudal anesthesia failed completely for the following reasons: 1. The needle was inserted into the subarachnoid space, 4 cases. 2. Hysterical patients became unmanageable. 3. Disproportion of the head and pelvis with prolonged labor. 4. Insertion of the needle into the caudal canal was technically impossible, 4 cases. 5. A psychotic patient who was completely disoriented and could not be managed. 6. The catheter slipped out in three cases where technic of tapping was faulty. 7. Severe nausea and vomiting. 8. Severe radicular pains. . . . Continuous caudal anesthesia should not be used in: (1) Cases of placenta praevia and abruptio placentae; (2) cases of disproportion between the head and pelvis; (8) gross abnormalities of the spine in the lumbosacral region; (4) patients who have had recent surgery about the sacral area, such as a pilonidal cyst excision; (5) patients with any skin disease or with multiple boils or carbuncles; (6) patients who give a