placed on the table. Preoperative sedation is prescribed by the surgeon."

J. C. M. C.

HINGSON, R. A., AND EDWARDS, W. B.: *Continuous Caudal Analgesia in Obstetrics.* J. A. M. A. 121: 225–229 (Jan. 23) 1943.

"Continuous caudal analgesia was developed to relieve the pains of labor and delivery. Since its beginning we have sought to improve our apparatus and refine our technic in order to provide the maximum of comfort for the mother with a minimum of risk for her and the baby. . . . In a previous paper, we wrote that we used this procedure in obstetrics only after it had been thoroughly studied in the management of twenty surgical operations on the perineum and lower extremities. We first used it in our surgical service, working with Southworth, in October 1941 for a bilateral phlebectomy. Since that time we have managed the entire course of six hundred labors and deliveries with this method without resorting to any other form of anesthesia. . . . In the series of 100 cases of delivery handled by continous caudal analgesia, the percentages were as follows in the U. S. Marine Hospital, Stapleton, N. Y.: primiparas 89 per cent, multiparas 11 per cent, cephalic 98 per cent, anterior 84 per cent, posterior 14 per cent, breech 2 per cent. In this series there were only 3 per cent unsatisfactory cases in which supplementary anesthesia was necessary. Since Jan. 1, 1942 we have either managed or supervised the labor and delivery of 489 additional cases in the clinics of nineteen medical schools and teaching hospitals. In this group there were eleven breech deliveries, one set of twins and one cesarean section. Of this series 11 per cent obtained unsatisfactory analgesia, necessitating either discontinuance of the method or the addition of supplementary anesthesia. In many of these cases the technic was being practiced by residents who were learning the procedure. In the entire series of 589 cases there were 586 live births with no maternal complications or deaths. The average length of time the analgesia was continued was six and one-half hours. The shortest was thirty-five minutes and the longest was thirty-three hours The average metycaine dosage was 2.6 Gm. The maximum dosage given was 11 Gm.

"In cases of toxic hypertension it was noted that after the analgesia had been in effect for about forty-five minutes the pressure reached a plateau which corresponded to their normal before they became toxic. This drop persisted until after delivery and in the cases observed did not return to the toxic peak. All the patients stated that they felt much better. . . . This method involves a new analgesic technic which should be studied under those who have been trained in the method before it is employed in practice. Obviously, the method depends also for its success on a high degree of obstetric competence, avoiding cases in which there are contraindications, avoiding meddlesome or hasty obstetric intervention and observing well established criteria for observation of the progress of the delivery." 13 references.

J. C. M. C.

GREADY, T. G., JR., AND HESSELTINE, H. C.: *Continuous Caudal Anesthesia in Obstetrics: Preliminary Report.* J.A.M.A. 121: 229–230 (Jan. 23) 1943.

"Continuous caudal anesthesia has a place in obstetrics. There are some dangers and contraindications to this method. Cautious but repeated experiences with the method are desirable to evaluate it. These preliminary observations with some of the advantages and disadvantages are presented in the

hope that others interested in this field may become aware of our experience. In this series of 20 patients there were 3 failures; 1 of these presented a typical shock reaction. . . . In our series of 20 cases . . . 14, or 70 per cent, were completely successful, 3 were satisfactory but not ideal, and 3 were classified as failures. Of the 14 cases in which continuous caudal anesthesia was used during labor and delivery, 10 were completely successful and 3 others were termed satisfactory. There was 1 failure. . . . Two abdominal sterilizations done following labors were completed successfully without straining and without pain when the tubes were crushed or the peritoneum manipulated. . . . [An] abdominal hysterectomy on an eighteen weeks pregnancy was successful; the abdominal wall incision and the evacuation of the uterus took place with complete freedom from pain or distress. The anesthesia was started on 3 patients for cesarean section. In 1 of these there was insufficient anesthesia of the abdominal wall for incision. Further attempts to anesthetize were not attempted. In another case, that of a toxemia of the hypertensive type, good skin anesthesia was obtained to the level of the xiphoid but the patient's blood pressure fell from 190 systolic to an indeterminate level before any operative procedure was attempted. She responded in thirty minutes after the administration of ephedrine hypodermically and oxygen inhalations. No further attempt with caudal anesthesia was made on this patient. The third section was performed successfully by means of the continuous caudal method. . . .

"It has been observed that if the solution is injected with the patient on her side (instead of in the knee chest position) the most dependent side is the first to become anesthetized and that the level of anesthesia extends higher on the dependent side. In some cases it seemed possible to get a higher level of anesthesia by injecting with the patient in the Trendelenburg position. There seems to be a direct proportion between the amount of drug given in a single injection and the level of anesthesia on the abdominal wall and also between the force of injection and the level of anesthesia. The longest continuous period over which the drug was administered was eight hours, the procedure usually being started when the cervical dilatation was 5 cm. or more. Practically all patients showed a drop in blood pressure from 10 to 30 points or more, the greater falls occurring in patients with some hypertension; 2 had a secondary rise in pressure to above the previous maximum when the anesthesia wore off. . . . Two patients complained of severe pains in the back and legs after the drug wore off, 1 requiring morphine for relief. Neither had any sequela during the remainder of the puerperium. One patient with whom the anesthesia was succesful complained of severe throbbing headache during the injection. This lasted for about three minutes and recurred with each subsequent injection, lasting the same length of time. Another patient complained of severe burning pain in the lower extremities beginning a few seconds after each injection and lasting about one minute. This was obviated by giving subsequent injections while anesthesia was still complete. . . .

"The continuous caudal method of anesthesia possesses advantages: 1. It is a useful form of nerve block anesthesia when a general anesthetic is contraindicated, as in pulmonary tuberculosis or upper respiratory infections. 2. The uterus appears not to relax and appears to maintain its normal motility and mechanism in contrast to its behavior under deep inhalation anesthesia. 3. Narcotics and sedatives are eliminated during the course of labor and delivery. 4. The procedure is a relatively simple one and seems safe for

those skilled in this procedure. 5. At laparotomy (cesarean section) the peritoneum is not sensitive as it is when done under local anesthesia. 6. Patients in labor are calm, quiet, relaxed and rational. 7. It makes use of the principle of giving repeated amounts of a drug over a long period of time. . . .

"Some of the conditions which present themselves and which might be presumed to be disadvantageous and dangerous are: 1. The greatest danger would seem to be that of injecting this amount of drug into the subarachnoid space. . . . 2. There is a loss of the subjective pain element as an aid to following the progress of labor. 3. . . . It is not a time saving procedure, since a skilled person must insert the needle and inject the medication at intervals of thirty minutes or longer. . . . 4. It either prolongs the second stage or increases the incidence of operative delivery, since the patient has absolutely no urge to bear down. 5. While this type of anesthesia has the advantage of providing a contracting uterus for normal labor and third stage, it is not the procedure of choice when a difficult forceps rotation or version is necessary, since here almost complete uterine relaxation is imperative. 6. Since 1 toxemic patient had a vasomotor or shock reaction, other toxemic or severe hypertensive patients have not been tested with this method. 7. It is assumed that the successful administration will increase from 70 per cent in the series of 20 patients to a distinctly more favorable rate as experience and judgment increase. . . . 8. The method does not give abdominal wall relaxation as compared to deep inhalation anesthesia. 9. That spinal anesthesia is contraindicated in cardiac patients with myocardial damage is a general belief, and the same may apply for continued caudal anesthesia. 10. At this time the procedure seems to be one exclusively for hospital usage because of the danger of complications. It is our belief that in carefully supervised and selected cases continuous caudal anesthesia is a valuable addition to the field of obstetric analgesia and anesthesia, and our work with it is continuing." 1 reference.

J. C. M. C.

MINNITT, R. J.: *Analgesia and Anesthesia in Midwifery.* M. Press. 208: 410–412 (Dec. 23) 1942.

"Some years ago there was a great agitation in many quarters for the development of an efficient method for the relief of the pains of labour. . . . In the year 1933 a specially designed apparatus for gaseous inhalation was produced, and a technique of administration developed in order to try to procure the desired result. . . . During the winter of 1933 and the early part of 1934 an investigation into the value of this new treatment was conducted. . . . The following facts were noted: (a) The procedure was simple and inexpensive. (b) There was no danger to mother or child. (c) Relief from the pains of labour was given in a very high percentage of cases. (d) Labour was not prolonged. . . . Many different machines have been manufactured for the purpose of giving gas and air analgesia, but one underlying principle controls them all, viz., self-administration, which means that there is no flow of gas unless the patient inhales."

J. C. M. C.