

ciency of the drug, (2) the reduced number of reactions that could be ascribed to the drug and (3) the rapid elimination of the drug with a quick recovery of nerve impulses and physiologic control after delivery. . . . From our experience and the accumulated experience of others we believe that the following postulates should be emphasized by all obstetricians who use . . . [continuous caudal analgesia:] 1. The incidence of operative obstetrics is increased. No physician should use continuous caudal analgesia unless he is well trained in the use of forceps. 2. The incidence of posterior positions is increased to about 8 per cent because of the relaxation of the levator muscles with the resultant failure of a large number of the fetuses to rotate spontaneously. 3. The incidence of transverse arrest in the midpelvis is slightly increased because of the failure of the patient to use her auxiliary expulsive forces. 4. In the hands of the experienced, to offset the first three disadvantages, all types of operative obstetrics are facilitated because of the relaxation of the cervix, lower uterine segment and perineum. This relaxed state is not achieved by any other form of general anesthesia. 5. No oxytocic drug should be given until after the termination of the third stage of labor, because the uterus in every instance after continuous caudal analgesia contracts firmly with the delivery of the baby. Hemorrhage during the third stage is therefore definitely minimized. Gentle constant pressure on the fundus of the uterus as the placenta separates will usually expel it within two to five minutes after delivery. When oxytocic drugs are given immediately after the birth of the baby, the incidence of trapped placentas is increased. 6. Continuous caudal analgesia should be started only after labor is definitely established and the patient is in need of relief from pain. . . . 7. The babies born under continuous caudal anal-

gesia are just as alert and wide awake at birth as those born to mothers who had no form of sedation or anesthesia. Many of them cry before their shoulders are born. Therefore every attempt should be made to shield the mouth and nose of these babies from aspirating fluid and mucus as their noses cross the perineum. 8. The incidence of fetal mortality and morbidity may be expected to decrease considerably, since there is apparently less birth shock to them by this than by any other method. 9. The entire course of labor is altered from the picture described in textbooks under other forms of management. The first stage of labor is definitely shortened, the third stage is shortened and simplified. However, the terminal part of the second stage of labor is greatly prolonged unless outlet forceps are used on complete dilatation of the cervix and descent of the presenting part to the perineal floor. 10. An understanding of the anatomy of the peridural space, the sacrum and the surrounding structures is essential. A thorough knowledge of the neurology of the pelvic viscera is a prerequisite. A familiarity with the pharmacology of the cocaine derivatives and substitutes used in this method is necessary. The proper interpretation of the physiology of labor is altered by continuous caudal analgesia must be studied diligently. 11. For success with continuous caudal analgesia, knowledge of the related principles of the basic sciences must be combined with a high degree of obstetric competence and a skilful application of this new technic in anesthesiology. 5 references.

J. C. M.

LORHAN, P. H.: *Continuous Caudal Anesthesia in Obstetrics*. J. Missouri M. A. **40**: 346-348 (Nov.) 1943

"At the present time continuous caudal anesthesia in the hands of the

specialist in anesthesia seems to fill the needs of the ideal obstetrical analgesia for it provides for the mother a relatively comfortable labor and a painless delivery. The fetal mechanism of the newborn child is not impaired and the obstetrician works under conditions of marked relaxation and freedom from pushing and straining during delivery and postpartum repair. . . . Advantages of continuous caudal anesthesia [are] it is a useful form of block when a general anesthesia is contraindicated, narcotics and sedatives are not necessary, the procedure is simple in the hands of the experienced anesthesiologist, the patients in labor are calm, quiet, relaxed and rational [and] the uterus does not relax and it maintains its normal motility and mechanism. Disadvantages [are] . . . subarachnoid injection of the drug, the complete loss of the subjective symptom of pain [and it] requires a skilled anesthesiologist.

J. C. M. C.

MOON, L. E., AND CHRISTENSEN, J. B.: *Caudal Anesthesia: A Report of 3,500 cases in 21 Years of Proctologic Practice.* Nebraska M. J. 28: 376-378 (Dec.) 1943.

"Caudal anesthesia has been a popular procedure in rectal and perineal surgery for many years. Our experience with this type of anesthesia began twenty-one years ago and comprises some 3,500 cases. . . . Our use of caudal anesthesia has been limited to rectal surgery. . . . It has been our experience that the anesthesia takes effect more rapidly if the solution is at body temperature. Adrenalin is not contraindicated in our work, and two minims of 1:1,000 is usually added to each ounce of solution. The needle now used is 18 or 20-gauge three and one-half inches long. While a malleable needle may be necessary in continuous caudal, we have used both malleable and steel needles. . . . Two per cent novocaine is

used in all cases at present. . . . A test not usually stressed in descriptions of caudal anesthetic is the ease with which the solution should inject. . . . Spinal fluid was found in four of the cases here reported, or about 1 case in 1,000. In these cases, the needle was withdrawn only far enough to get out of the dura, and then the novocaine injected as usual. Blood is often encountered in varying amounts, but in no case caused the abandonment of the anesthesia. . . . Anesthetic solutions are now prepared in normal saline. No nerve injury has been demonstrated in any case during the time distilled water was used, but recent studies have proven hypotonic solutions injurious to nerve tissue. In the ordinary individual of average body weight and in general good health, we use a preoperative sedative. . . .

"Six cases of rather sharp reactions were noted in the series. It is possible that these reactions were the result of intravenous injections of two per cent novocaine. . . . The reaction is much like that seen in cases of allergy to foreign protein. . . . Usually, lowering the head and a little reassurance will carry them over the attack, which will last about two to three minutes. In the more serious case, a little oxygen will afford complete relief. We have never failed to get an anesthesia in these cases after the attack has subsided. It will be recalled that intravenous barbiturate and oxygen are indicated in novocaine poisoning. No cases of infection or large hematoma occurred in the series. . . . Caudal anesthesia is never used when the injection must be made into infected skin, or skin that has been covered with pus or drainage from an abscess, pilonidal cyst, or fistula. . . . A reasonable knowledge of the drugs and the sacral anatomy, along with a period of training should be acquired before caudal anesthesia is attempted." 3 references.

J. C. M. C.