ministered with a spinal anesthetic agent is that the spinal anesthetic agent produces intercostal paralysis, the pentothal sodium central paralysis and the result is extraordinarily quiet respiration. The administration of a combination of oxygen and nitrous oxide, half and half, reduces the dose of pentothal sodium enough so that respiration remains adequate. When this combination of pentothal sodium given intravenously and a mixture of half nitrous oxide and half oxygen by inhalation is used, it is important that these general anesthetic agents are not administered for at least fifteen or twenty minutes after the spinal anesthetic agent has been administered and that determinations of blood pressure are made at frequent intervals while this type of anesthesia is maintained. Because of the relative suddenness with which an untoward result may develop, pentothal sodium is seldom used for the preoperative prediction of the probable result of sympathectomy on hypertensive patients. The use of divided doses of sodium amytal by mouth can give practically the same information although the test requires a longer period of time with sodium amytal than with pentothal sodium. However, pentothal sodium given intravenously in small doses (7 to 10 cc. of a 2.5 per cent solution) before inhalation anesthetic agents are administered has proved advantageous for hypertensive patients. There is little change, however, in the contraindications to the use of pentothal sodium: it should not be used for children less than ten years of age unless they are large and 50 per cent oxygen and 50 per cent nitrous oxide is administered simultaneously, for patients who have cardiac disease and decompensation, nor for patients in marked shock especially when it is due to marked loss of blood.

"The use of pentothal sodium in doses sufficient only to produce light surgical anesthesia for such operations as extraction of teeth has been described by Hubbell and in time may be used widely. Barbiturates given intravenously have not produced satisfactory anesthesia for normal deliveries but have been satisfactory for cesarean section when given in association with local anesthetic agents. . . . The use of pentothal sodium instead of ether as an auxiliary agent to reinforce anesthesia with nitrous oxide and oxygen permits a technique which is fireproof."

J. C. M. C.

HELLMAN, L. M.; SHETTLES, L. B., AND STRAND, HERBERT: *A Quantitative Method for the Determinations of Sodium Pentothal in Blood.* J. Biol. Chem. **148**: 293–297 (May) 1943.

"The known methods for the analysis of barbiturates in blood, in which the Koppanyi colorimetric reaction is employed, have not proved generally satisfactory for the quantitative determination of the thiobarbiturates. . . . In the process of conducting a series of studies on the transmission through the human placenta of one barbiturate, sodium ethyl (1-methylbutyl) thiobarbiturate (sodium pentothal), it therefore became necessary to discover a method which obviated the errors in the known methods of analysis. With the ultraviolet absorption technique it was found that pentothal acid in ether demonstrated a maximum absorption at 2880 Å. With a quartz monochromator set for 2880 to 2900 Å., with inlet and exit slits at 0.5 mm., it was possible to obtain numerical values for varying concentrations of pentothal, these being read by means of an ultraviolet-sensitive cell and galvanometer. . . . Extractions were carried out on whole blood as follows: 25 to 30 cc. of venous blood were decalcified with 0.4 gm. of sodium citrate. Of this, 20 cc. were put in a

250 cc. separatory funnel and 2 cc. of a solution of crystalline sodium dihydrogen phosphate (1 gm. per cc.) were added. This mixture was thoroughly shaken and allowed to stand for at least 15 minutes. Four extractions were then carried out with technical ethyl ether as follows: 100, 50, 25 and 25 cc. The mixture was allowed to settle each time and then decanted into another 250 cc. separatory funnel. The color of the extract is yellow-brown and must be cleared by washing three times with 5 cc. of 0.5 M sodium bicarbonate, care being taken to allow for complete separation. The ether extract is now a very pale yellow color. It is filtered through ordinary filter paper into 500 cc. beakers and evaporated slowly over a water bath to approximately 35 cc. It is then transferred to 50 cc. volumetric flasks and made up to volume with ether. The results are read against a blank extract of normal blood. The blank is first read against ether and then adjusted to 100 per cent transmission by means of a vernier resistance in series with the galvanometer. The final reading must be multiplied by 2.5 to correct the dilution. The entire extraction is quite rapid and simple, but great care must be exercised to have absolutely clean glassware. In addition, the evaporation of the ether extract must be carried out slowly and not allowed to proceed too far toward dryness. Furthermore, as ordinary stop-cock grease will absorb ultraviolet light in the range used, it is necessary to employ a mixture of glycerol and bentonite, insoluble in both ether and water. . . . The method gives approximately 90 per cent recovery when tested against known amounts of pentothal added to blank blood." 4 references.

J. C. M. C.

LANCASTER, BLAKE: *Intravenous Anesthesia.* J. Florida M. A. 29: 477–479 (May) 1943.

"I have found intravenous anesthesia to be most pleasant and safe. It is admirably suited to minor work and is a marvelous adjunct to major surgery. It should be used carefully by experienced men in a hospital where adequate recovery time is available (about six hours), and respiratory stimulants and oxygen are at hand."

J. C. M. C.

KNIGHT, R. T.: *Spinal Anesthesia—Important Principles.* Minnesota Med. 26: 346–348 (Apr.) 1943.

"Trauma to nerve roots and spinal cord can be best avoided by making a perfect mid-line puncture. . . . The needle, after being tested, should then be handled without bending and inserted horizontally, and as slowly as it is possible to make anything move, until its point passes through the resistance of the ligamentum flavum and then of the dura. . . . The recognized strengths of the solutions of the various drugs, as they exist in the syringe before injection, and above which one cannot raise them without danger, are as follows: procaine, 5 per cent; metycaine, 5 per cent; pontocaine, 0.5 per cent (1–200); nupercaine, 1–1500. I do not believe one is justified in ever increasing these strengths. . . . Lundy has for years advocated the injection at the rate of 0.5 cc. per second, and this method has proven very satisfactory in the hands of all who have used it. Undoubtedly a considerably faster rate can be used with safety. Control of the height of anesthesia . . . is managed by varying the site of injection, the amount of solution injected, the specific gravity of the solution and the position of the patient after injection. . . . Considerable fall in blood pressure is dangerous, especially in the