sis develops . . . bronchoscopic aspiration of a mucous plug should be attempted." 4 References.

J. C. M. C.

KRAUS, HANS: *The Use of Surface Anesthesia in the Treatment of Painful Motion.* J. A. M. A. **116**: 2582–2583 (June 7) 1941.

"This paper describes a method of treatment for impaired function when pain is the factor responsible for the loss of motion or power. The treatment is the application of a surface anesthetic (ethyl chloride spray) combined with active motion. . . . At first only sprains were treated; later, acute muscular spasms due to conditions such as lumbago and acute bursitis of the shoulder as well as muscular spasm accompanying various chronic conditions, such as sciatica, low back pain and pain recurring after old injuries. The use of active motion is an essential part of the treatment. . . . The painful region must be determined through active motion. The direction in which the motion is impaired is first determined. Then ethyl chloride is sprayed on this area of skin. The patient then starts careful active motion of the part involved, in the direction in which the motion has been painful and limited. As the patient carefully increases the movement, new painful areas—which up to this point have been hidden through blocked motion—will develop. Those areas again have to be sprayed and active motion continued. These treatments last from ten to thirty minutes and should be performed carefully and well within the limits of pain. Immediately after the treatment, camphor liniment should be applied to the skin, to avoid frostbite. . . .

"While a single treatment will be sufficient in cases of minor involvement, patients with more severe involvement will have to be treated several times: the first week, daily—later, every other day. An effective treatment, however, should not call for the anesthetic after the second week, whereas active motion will have to continue until normal muscular power is restored. Immobilization after treatment is contrary to the basic principle and should, therefore, never be combined with it. . . . Normal anatomy must be present if this treatment is to be used effectively. . . . I have no explanation to offer as to how this deep effect of surface anesthesia works. It seems to be a fact, but the underlying physiologic explanation presents an interesting field for exploration. It must be definitely understood that in no case will the ethyl chloride alone, without active motion, achieve good results." 5 References.

J. C. M. C.

LEMMON, W. T., AND PASCHAL, G. W., JR.: *Continuous Spinal Anesthesia with Observations on the First 500 Cases.* Pennsylvania M. J. **44**: 975–981 (May) 1941.

"We gave the first continuous spinal anesthesia to a patient on Apr. 10, 1939. Since that date we have administered more than 500 spinal anesthesias by this method. . . . In continuous spinal anesthesia we employ a short-acting agent, procaine hydrochloride (novocain), which is injected in fractional doses as needed during operation. The patient is placed on a specially designed mattress, and a very flexible, German silver, lumbar puncture needle remains in place in the subarachnoid space. This needle is connected into a syringe by means of a 30-inch piece of rubber tubing which is provided with Luer-lok connections at either end. . . .

"Three grains of nembutal is given the evening before operation, thus insuring the patient a good night's sleep. Three hours before operation, 3 grains of nembutal is administered by mouth.

One hour before operation a hypodermic containing one-fourth grain of morphine sulfate and one-hundredth grain of scopolamine hydrobromide is given. If the sedation is not sufficient, one-eighth grain of morphine sulfate is given intravenously or hypodermically as often as necessary during the operation. By using the proper sedation, these patients do not remember having a lumbar puncture or being operated upon. Most of them sleep throughout the operative period and afterwards for many hours. During long and difficult operative procedures an intravenous injection of 10 per cent glucose solution is given into a vein in the leg. These patients often receive a blood transfusion at the end of the operation. . . . The average age for the first 500 cases was 39 years. The oldest patient among this group was 83 years. The youngest was 8 years. . . . The average length of the operations in this series was fifty-three minutes. A total gastrectomy required two hundred fifteen minutes. . . .

"For this series the average total dose of novocain was 242 mg. The average number of injections per patient was 2.6. The largest dose given to any one patient was 2100 mg. of novocain. A definite free flow of spinal fluid was obtained, but the patient was most resistant to the drug. His operation was an appendectomy and excision of a left varicocele. The smallest dose was 25 mg. of novocain for a hemorrhoidectomy. . . . There was an average fall in blood pressure of only 14 points. . . . The incidence of headache (2.5 per cent after continuous spinal anesthesia) . . . is no greater than when anesthesia is given by the former single injection method. . . . This method has no greater incidence of urinary retention than the ordinary method of spinal anesthesia. . . . The incidence of retention was 3.1 per cent. . . . There were 19 cases with pulmonary complications, making an incidence of 3.8 per cent for this series of 500 cases. . . . There were no motor or sensory disturbances, no cranial nerve palsies or other neurologic phenomena. . . . There were 27 deaths among this series of 500 cases, putting the gross mortality at 5.4 per cent. . . . In none of these deaths do we believe that the anesthetic agent had any part. . . . Every operation was begun and completed under spinal anesthesia. . . . We hope that this method of spinal anesthesia proves to be safer and more controllable than older methods."

J. C. M. C.

NEUWELT, F.; LEVINSON, S. O., AND NECHELES, H.: *Studies on Shock. III. Variability of the Shock Syndrome in Toxic Drug Shock.* Surgery **9**: 503–507 (April) 1941.

"We have been interested in the condition of hemorrhage and shock and its treatment by various infusions. Animal experiments were performed in which profound shock was produced by various means. . . . We employed various drugs in order to produce shock: histamine, peptone, croton oil, and anesthesia. There was no constancy in the effects of the above drugs when used on anesthetized and unanesthetized dogs, nor was there any constant correlation between the dose of the drug and the production of shock in the individual animal in our 46 experiments. . . . Even when profound shock is produced, changes in blood pressure, alkali reserve, and extent of hemoconcentration vary widely from experiment to experiment. Profound or even fatal capillary shock may occur without the development of hemoconcentration at any stage of its course." 7 References.

J. C. M. C.