

the respiratory system is hampered, either through cerebral or stimulatory causes. Hence, in operations upon the brain or spinal cord if chloroform is to be used, also in cases in which cyanosis or asphyxia is present, unless when the latter is due to cardiac insufficiency, then use is detrimental.

When the general anesthetic selected for a prolonged operation is carbon dioxide in combination with oxygen, it is obligatory to use the M.A.S. (i.e., morphine, atropine, and scopolamine) injection to deepen anesthesia. Hence prognosis in these cases is difficult to gauge, since the respiratory centre is rendered more susceptible to the morphine action.

Strophanthine given hypodermically just before an anesthetic with the view of antidoting chloroform, but it does not accomplish the object intended; it is probably detrimental, and when associated with morphine produces little if any beneficial effect, although it prolongs anesthesia and causes the muscular rigidity of the patient to be emphasized. It is of any value in the small doses usually adopted, only in the direction of stimulating the respiration.

Chloralyl (Chloraloxyl) (gr. xv), given ninety minutes before the anesthetic, determines drowsiness, and certainly diminishes the risk of a sickness.

C. Analgesics. The dangers of *cocaine*, both in endermic injection and in intrathecal injection, and when introduced into the nostrils, are so well known that most persons have relinquished its use.

Novocain is probably the safest drug for local and regional analgesia, properly sterilized and employed with the addition of adrenaline.

Stovaine seems less employed in local analgesia, owing to its damaging effect on the tissues; but it is certainly one of the safest of the drugs used in intrathecal injection. It produces some hemolysis, and it is not free from the liability of being followed by oculomotor paralysis and other dangers.

Topocaine and *alypca* have their advocates, but probably neither is as safe as stovaine for spinal analgesia. The question of combining these drugs with adrenaline is discussed under another caption (see *Methods of Employment*).

The prognosis as to danger in the use of local and spinal analgesia is extremely difficult to estimate, as so much depends upon the method employed and the condition of the patient, and these are variants in all cases. This fact renders generalization of little practical value. We know, however, that these methods, especially the intrathecal injection of drugs, have inherent sources of danger, since when the analgesic has once entered the tissues it is impossible to abrogate its action. Slight errors in technique also matter more in such procedures than in inhalational methods. Assuming experience, absolute asepsis, and careful regulation of the dose, the danger to life is probably not great in the hands of experts, and the sequelae are not necessarily serious. It is, however, impossible, in the present state of our knowledge, to promise total immunity from them, or to forecast the degree of their severity.