

choice are morphine and scopolamine or atropine. For local and spinal anesthetics a barbiturate may be added to the morphine-scopolamine combination. This barbiturate should be used as prophylaxis against procaine reactions. Morphine requires sixty to ninety minutes for full sedative effect upon metabolism, but in emergencies it may be given intravenously along with atropine or scopolamine.

"Factors influencing the choice of an anesthetic agent are: the surgeon, the surgery contemplated, the patient and existing pathology, the ability and technic of the anesthetist, and the methods at hand.

The evaluation of an anesthetic agent should rest on the following factors: chemical dependability of the agent, potency, control, resultant damage upon systems, ease of induction and recovery, and commercial properties. The margin of safety of an agent may be defined as the amount of drug and length of time required to pass from light surgical anesthesia to death.

"Ether is a potent agent with a wide margin of safety, offering good relaxation. It is toxic to metabolism in general, is best administered with the gases by the carbon dioxide absorption technic, but it is highly explosive when vaporized with air or oxygen.

"Chloroform and ethyl chloride are potent with a narrow margin of safety, and are quite toxic. Their use is to be discouraged.

"Vinyl ether is of advantage for short operations or for induction to ether anesthesia.

"Nitrous oxide and ethylene are weak anesthetic gases with a narrow margin between anesthesia and asphyxia.

"Cyclopropane is perhaps our nearest approach to an ideal inhalation agent. The gas is potent and has a low toxicity and a wide margin of safety. Induction and recovery are

rapid, systemic effects are minimal, oxygen concentration remains high and poor risk patients tolerate it well. It is an explosive gas.

"Avertin is a weak agent and its use is confined to basal anesthesia with supplementary cyclopropane, nitrous oxide, or local infiltration. It is contra-indicated in patients with hepatic and renal disease, toxemia, shock, pulmonary disease, old age, hyper- and hypotension and pathology of the lower bowel.

"Spinal anesthesia does not disturb metabolism, offers marked muscular relaxation and allows recovery without nausea and vomiting.

"Intravenous anesthesia with the barbiturates (pentothal sodium preferred) finds a large field of usefulness in short surgical procedures.

"There are many agents and methods to consider when choosing an anesthesia. The paramount factor for the safety of the patient lies in the knowledge and skill of the individual who administers the drug."

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BURSTEIN, CHARLES L., AND ROVENSTINE, E. A.: *Autonomic Activity and Anesthesia. 1. Some Effects of Parasympathetic Drugs During Anesthesia.* *Anesth. & Analg.* **19**: 293-297 (Sept.-Oct.) 1940.

"Interpretation of the pharmacological action of drugs affecting visceral activity requires consideration of data recently accumulated from the experimental study of anesthetic drugs.

"Among the important factors are: (1) Practically all anesthetic drugs influence the activity of the autonomic nervous system. Ether, chloroform and divinyl oxide produce reactions associated with adrenergic mechanism and barbituric acid derivatives and cyclopropane exhibit a cholinergic type of response. Spinal anesthesia causes paralysis of the sympathetic division.

(2) Depth of anesthesia is important since visceral activity may vary with a single anesthetic agent depending upon the degree of narcosis. (3) Individual autonomic nervous system disequilibrium may distort the usual response of drugs. . . . Preponderance of the parasympathetic effects may be manifested by pallor, cold and moist skin, bradycardia with occasional extrasystoles, hypotension, myosis, asthma and gastrointestinal hyperkinesia. Individuals with sympathetic preponderance are those who have a dry and warm skin, bulging eyeballs with enlarged pupils, tachycardia, hypertension and gastric hypotonia. Some may present an imbalance with one division of the autonomic nervous system predominating. . . . These reactions are presently explained by the liberation at the reacting organ of either acetylcholine or sympathin. A third substance, choline-esterase, present in the tissues, hydrolyzes the liberated acetylcholine and thereby is instrumental in the control of the sympathin-acetylcholine balance.

"Effects of Atropine and Scopolamine. . . . Atropine has long been employed as the pharmacological inhibitor of the parasympathetic nervous system; an effect due to its inhibiting action of acetylcholine at the neuro-effector junction.

"Scopolamine has a pharmacological action similar to atropine and in addition is a cerebral sedative. . . . It has been demonstrated in the experimental animal and reported clinically that atropine is effective for prophylaxis and treatment of laryngospasm which frequently follows the use of intravenous barbituric acid derivatives. It has also been shown that laryngospasm occurring during cyclopropane anesthesia may be relieved by the administration of atropine. . . . Atropine and scopolamine depress the carotid sinus, cardio-aortic and associated reflexes.

Atropine and scopolamine may present some disadvantages in sympathetico-tonic individuals. Many patients complain of dryness of the mouth, and flushing of the skin is frequently observed.

"The reduction of pulse pressure is encountered in sympathetico-tonic individuals receiving therapeutic doses of atropine or scopolamine for premedication."

An illustrative case report is given.

"*Effects of Physostigmine and Prostigmine.*—Physostigmine stimulates the parasympathetic division of the autonomic nervous system. This is due to the inhibition of choline-esterase so that the action of acetylcholine is more effective. Its use in anesthesia was suggested by Garrelon who observed that its administration to 'resistant' patients was invaluable. . . . There is a marked reduction of pulse pressure which is enhanced by atropine or scopolamine or from direct sympathetic stimulation as may be occasioned by ether anesthesia, etc. The injection of physostigmine effects a return of the pulse pressure toward normal.

"Although physostigmine may be useful in sympathetico-tonia, in vagotonic individuals it, or any other cholinergic drug, is contraindicated.

"Prostigmine, like physostigmine, inhibits choline-esterase, the normal inactivator of acetylcholine, to produce parasympathetic stimulation."

A case report is given.

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GWATHMEY, J. T.: *Fifty Years of Anesthesia.* Am. J. Surg. n.s. 51: 233-243 (Jan.) 1941.

"Research by laboratory workers has produced such definite results for intravenous, spinal and local anesthesia that, together with the increased knowledge and skill of the surgeons, relief from pain is as safe and certain with these drugs as with inhalation anes-