

spiratory depression. This damage may be a direct drug effect. . . . Another way in which one may cause cardiac damage is by a mistaken effort to deepen anesthesia by a reduction of oxygen supply. Heart muscle is very sensitive to lack of oxygen, whatever the cause. . . . When a patient goes into shock during a surgical procedure, the question often arises whether it is due to surgery or the anesthetic. The correct answer is, although it may be caused by either one, it is often due to both. Experimental work has shown that after an hour of deep ether anesthesia only half as much manipulation of a rabbit's intestine is required to produce shock as under a short light anesthetic. The relaxation of the tone of both smooth and skeletal muscle, the vascular dilatation and the heat lost are all especially important in the production of shock under deep ether. These are much less marked in light anesthesia than in deep. The presence or absence of delayed effects following deep anesthesia is often the criterion by which a good anesthetic can be judged. Nausea and vomiting are the most disturbing to the patient. These may follow any anesthetic, but seem to be more pronounced in a case where the patient has an acidosis. . . . Pulmonary complications are one of the most common, most evident and most dreaded sequelae of major surgery. . . . Recent work in the Mayo Clinic has shown that major operative procedures in the upper abdomen are most likely to be followed by lung complications, regardless of whether local, spinal or general anesthesia is used. . . . In our discussion thus far we have attempted to elaborate the idea that deep anesthesia is desirable and necessary for relaxation in many cases, but that some of the side effects are quite undesirable and may be unnecessary. . . .

"The prevention of shock is best ac-

complished when the anesthetist is acutely aware of the beginning symptoms and takes measures early to combat further development of this condition. Lowering the head of the table, extra warmth, and starting glucose or blood transfusion when the pulse first starts up and the pressure starts down are in many cases life-saving. Some other measures that favor fewer anesthetic complications are to have the patient rebreathing carbon dioxide oxygen, and to have him reacting when leaving the operating room if possible. See that there is a free airway and that the color is good. Keep him warm if the weather is cool, but do not wrap him in blankets if it is 100° August weather. If this is done, the result is a great deal of fluid depletion by excessive sweating."

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CHIVERS, E. M., AND EVANS, W. E. F.: *Anaesthesia in Surgical Shock*. Brit. J. Anaesth. 17: 92-97 (Jan.) 1941.

"From the anaesthetist's point of view shock may be defined as a condition of acute depression of the respiration and circulation, and as such presents a combination of factors producing anoxaemia of the tissues. Patients in this state are unsuitable for operation and, whenever possible, treatment is postponed until the condition improves. . . . Treatment consists of: (1) Rest. (2) Relief of pain. (3) Warmth. (4) Fluid replacement. (5) Stimulants. . . . The disadvantages of morphia [for premedication] are more than counterbalanced by the relief of pain afforded. Omnopon gr. $\frac{1}{2}$ with scopolamine gr. $\frac{1}{400}$ is a good routine mixture and may be reduced if necessary. . . . The barbiturates and bromine-containing basal anaesthetics are all respiratory depressants and are, therefore, to a certain extent contraindicated. . . . Except for scalp wounds and for the reduction of minor fractures there are few occasions in which

local infiltration is of use in traumatic surgery. . . . Regional analgesia . . . provides excellent relaxation and nerve block is useful for injuries of the leg or chest, but not so satisfactory in the arm. . . . Spinal analgesia is not suitable for patients already shocked. . . . Intravenous barbiturates should be given slowly through a fine needle, and on no account should any standard dose be adopted, but each case watched closely throughout the induction. . . . The tolerance for these drugs is considerably reduced in shock, and the rate of elimination is also reduced. . . . Nitrous oxide is unsuitable alone, but when used with oxygen is probably the best and safest of the common anaesthetics for this type of patient. . . . Ether is probably the most popular anaesthetic. It is easy to use, is safe, and satisfies most of the requirements of an anaesthetic. . . . Divinyl ether is more expensive than di-ethyl, but has some advantages over it provided that the necessary apparatus is at hand. . . . Cyclopropane has three very great advantages. Very high oxygen percentages may be used (75 to 90 per cent), there is a slight increase in blood pressure, and there is little toxicity or lung irritation. . . . Chloroform, owing to its high toxicity, is unsuitable in shocked patients."

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KAUFMAN, P. A.: *Gangrene Following Digital Nerve Block Anesthesia; Report of a Case*. *Arch. Surg.* **42**: 929-938 (May) 1941.

"Among the commonest of the so-called bread and butter surgical procedures are minor operations on the fingers and toes under regional anesthesia produced by blocking the digital nerves at the base of the digit. As commonly employed the technic involves the injection of a 0.5 to 2 per cent solution of freshly prepared procaine hydrochloride (with or without a small amount of epinephrine added)

into the base of the proximal phalanx either by circular infiltration or by deposition of the anesthetic in the region of the lateral digital nerves. It has been generally recommended that a tourniquet be applied at the base of the digit in order to delay absorption of the procaine into the general circulation, thus enhancing its local effect. Garlock, in pointing out that this widely followed procedure is not entirely without danger and that gangrene of the involved digit may supervene, attributed this complication to the use of the tourniquet. . . . It is indeed strange that gangrene following digital nerve block has received so little attention in the American literature. Except in Garlock's report it has not even been recognized here. A survey of the European literature, however, uncovered 25 cases published in greater or lesser detail. . . .

"Age and sex do not appear to play decisive roles in this condition. . . . It appears reasonable to suppose . . . that a tight tourniquet may contribute to local vascular injury, and I personally feel that it should be counted a contributory factor in those cases in which it was used. . . . A word or two should be added about the danger of hot soaks immediately after an operation under nerve block anesthesia. In my own case, as well as in that reported by Halla, a severe burn was caused by the patient's immersion of the anesthetized digit in boiling water. It is possible that this may have occurred in other cases in this series without even coming to the attention of the respective authors. If the universally discredited phenol dressing can result in gangrene, then certainly boiling water can easily do the same. . . . One observation stands out clearly in all the cases in the series: The extent of the gangrene is uniformly limited proximally by the level of the injection. . . . The exact nature of the factor producing the local vascular injury