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The prevention of blood clotting by Dakin's sodium hypochlorite solution.

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It has been shown by Austin and Taylor that Dakin's solution dissolves necrotic tissue in wounds and washes away blood clots. Sweet has stated that the dressing of wounds with this solution favored hemorrhage from them. We made experiments to determine whether the solution prevented the clotting of blood in vitro and wish to record some of the facts observed.

We found that Dakin's solution of sodium hypochlorite added to blood in vitro was able to prevent clotting. If blood of a dog is drawn directly into Dakin's solution in the proportion of one part of Dakin's to ten of blood, clotting is usually prevented entirely. In a few instances such blood showed the formation of small, soft clots after standing several days. In no case was there any sign of clotting when as much as 1.5 c.c. of Dakin's to 10 c.c. of blood were used, even after standing as much as four weeks. There is a slight difference between the blood of different species; thus cat blood is prevented from clotting by rather smaller amounts than are required for the dog, while rabbit blood requires rather more and guinea-pig blood needs about 4 c.c. for each 10 of blood.

Dakin's solution on standing is said to lose its effectiveness as an antiseptic and its toxicity when injected intraperitoneally. Its power to prevent clotting was found to be reduced to about half in a week and it remained at this point for several weeks. Thus of a certain sample 0.8 c.c. were required to prevent clotting in 10 c.c. of blood when fresh; 1.4 c.c. when 10 days old and 1.5 c.c. when 40 days old.

Blood preserved from clotting by Dakin's solution is not affected by calcium salts but is readily caused to clot by tissue extracts. When the Dakin-blood mixture is fresh the clot formed on addition of tissue extract, forms promptly and becomes firm, but

after the mixture has stood a few days the clot forms more slowly and tends to remain soft. At this time the clot becomes more firm if fresh serum, containing fibrin ferment is added as well as tissue extract. When the mixture has stood for several weeks, clotting can no longer be induced.

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The minimum number of respirations sufficient to maintain life.

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We have made experiments on the dog to determine how few respirations will maintain life. Both artificial respiration of the ordinary type and the spontaneous respirations of the animal were used for this purpose. We will speak only of the results obtained by the use of artificial respiration.

Ether was used for the exposure of the trachea. A T-shaped glass cannula inserted and firmly tied in the trachea was provided with a respiratory valve, devised by Dr. Meltzer, which in turn was connected with a source of air pressure.

There are two series of experiments. In the first series curare was injected to completely abolish the respiratory movements. We began with two artificial respirations per minute continued for periods varying from 40 to 80 minutes. In all of the 19 experiments the dogs were living at the close of the period. The vagi were intact in 12 experiments; they were cut in 7 experiments. While the volume of air introduced was not measured, it was obviously much below the total lung capacity.

In the second series curare was omitted. A clamp was applied to the trachea below the cannula as a precaution against the entrance of air between the artificial respirations. There were 13 experiments. In 8 the vagi were intact. Of these two survived. Four died in about 25 minutes; two died in about 75 minutes. In 5 experiments the vagi were cut. All died.