lymph and must be looked upon as the original method of transmitting materials, a method still of first importance among primitive types and retained to a significant extent even in the vertebrates.

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Effect of Dextrose-Alcohol Mixture upon Pulmonary Fat Embolism.

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The therapy of post-traumatic pulmonary fat embolism has rereceived little attention. We have studied the effect of various organic and inorganic substances upon the fat globules which lodge in the capillaries of the lungs after the intravenous injection of a known quantity of sterile fat from an animal of the same species.

Twenty-four large Belgian hares and 4 dogs were used. Normal, healthy animals of the same litter were used in each series of experiments.

The sterile fat was warmed to 37°C., and injected into either the marginal vein of the ear of the hares, or into the saphenous vein of the dogs. The injections were carried out at the uniform speed of 1 cc. per minute and without undue force. Four animals were used in each series of experiments. Into each animal we injected 1 cc. of the warmed, sterile fat per kilo of body weight. One animal of each series was kept for the control. The other 3 animals were treated by an intravenous injection of 5 cc. per kilo of body weight of the following dextrose-alcohol mixture: Ethyl alcohol C. P. (96%) 3 parts; dextrose C. P. (25% solution in water) 7 parts.

Two of the remaining animals of each series received a second injection of the same quantity of this mixture at the end of 12 hours. Twenty-four hours after the injection of the fat, one of the last 2 animals was again treated by a third injection of the same quantity of the mixture intravenously. All of the animals of each series were killed by an intracardiac injection of sodium cyanide 48 hours after the fat was injected into the blood stream. Immediately after death the lungs of the animals were placed in a large quantity of 10% solution of formaldehyde in order to insure complete fixation.

The amount of intravascular fat in the lungs was estimated for each animal of the various series, by studying, under the high power of the microscope, numerous corresponding sections of the pulmonary tissue from all of the lobes of the lungs. These sections of the pulmonary tissue were cut with the freezing microtome and the fat droplets were stained by Sudan III. Methylene blue was used as the counterstain.

Those animals which received the intravenous injection of relatively large amounts of fat developed severe dyspnoea, cyanosis and extreme restlessness, but these manifestations of a disturbance in the aeration of the blood disappeared almost immediately after one intravenous injection of the dextrose-alcohol mixture in the proportion of 5 cc. per kilo of the body weight of the animal. It has also been shown that such a therapeutic effect can be produced consistently by a dose which is less than 25% of the lethal dose of the dextrose-alcohol mixture. The various doses of this mixture for the usual laboratory animals have been found to be as follows:

Minimum Effective Dose	2.5 cc. to 3.5 cc. per kg. body wt.
Therapeutic Dose	4.5 " " 6.5 " " " " "
Narcotic Dose	7.5 " " 10.0 " " " " "
Lethal Dose	20.0 " " 26.5 " " " " "

It was found that when a dose of 4.5 cc. to 6.5 cc. per kilo of body weight of this dextrose-alcohol mixture was given intravenously to healthy animals no untoward symptoms developed.

Results. The lungs of the animals which received 3 intravenous injections of the dextrose-alcohol mixture were almost free from intravascular fat, while all of the capillaries of the lungs of the control animals contained large amounts of fat. The amount of intravascular fat in the lungs of the other animals of the series appeared to be inversely proportional to the number of intravenous injections of the dextrose-alcohol mixture which they had received.

Volumetric determinations of the neutral fats, the fatty acids, cholesterol, and phosphatids in the venous and arterial blood, before and after the intravenous injection of the fat and before and after the treatment with the dextrose-alcohol mixture, are being made to determine the quantitative distribution of the fat in the various portions of the general and the pulmonary circulations and the rate of disappearance of the fat from the blood stream following this method of therapy.