

Serum albumin acting as a hydrated colloid, as pointed out so beautifully by Fischer,⁹ is able to form a fairly stable (emulsion) with any of the very delicately balanced precipitating systems used in serologic work. The slight upset to this balance of this system by partial coagulation of the albumin by heat (sufficient to produce a change in clarity when serum is properly inactivated) or the simple dehydration of the albumin by drying and then redissolving it removes the inhibiting effect to such an extent as to allow the full action of the precipitinogen. It is very doubtful if this "redissolved albumin" is as well hydrated or can function as well as it could in its natural state.

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**CO₂ Combining Power of the Blood Plasma Before and After
Ethylene Anesthesia in Diabetics Protected With Insulin.**

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Formerly diabetics were regarded as very poor surgical risks. Not only was there fear of infection and poor healing but the effect of a general anesthetic was dreaded. Since the advent of insulin it has been shown that diabetics may be operated upon with almost the same degree of safety as normal individuals. Even in normal persons the administration of general anesthetics may produce an acidosis. The metabolism may be profoundly affected. The post-operative period of vomiting and starvation contribute still further to the threat of acidosis. The administration of a general anesthetic to a diabetic, therefore, has been in the past a matter of no small concern. In spite of this there have been apparently recorded in the literature few definite observations as to the alkali reserve of the blood in diabetics under anesthetics and afterwards. The only 2 references I have been able to find in the insulin era have been those of Rabinowitch¹ and McKittrick and Root.² The former gives data as to the pH and CO₂ combining power in 2 diabetics under ether. He does not state whether insulin was used. McKittrick and Root state:

⁹ Fischer, M. H., and Hooker, M. O., *Fats and Fatty Degeneration*, John Wiley & Sons, New York, 1917.

¹ Rabinowitch, I. M., *Current Researches in Anesthesia and Analgesia*, 1925, iv, 267.

² McKittrick, L. S., and Root, H. F., *Diabetic Surgery*, Lea & Febiger, 1928, 78.

"We have used the plasma CO_2 combining power as the best index of acidosis and it is true in 15 cases a reduction in this value occurred as a result of operation, with a return to normal within 24 hours due to the use of insulin and carbohydrate food." Rabinowitch pointed out: "The finding of a low CO_2 combining power in the plasma does not always necessarily denote acidosis. The lowered CO_2 combining power may be due merely to the increased pulmonary ventilation accompanying anesthetics. In increased pulmonary ventilation an excessive amount of carbonic acid is taken from the plasma and alkali passes into the tissues to maintain the $\text{H}_2\text{CO}_3/\text{NaHCO}_3$ ratio constant."

I have thought it worth while, therefore, to report the observations made on 17 diabetics to whom a general anesthetic was administered.

TABLE I.

Age	Operation	Anesthetic. Duration of Anesthesia	Pre-operative		Post-operative*	
			Blood sugar	CO_2	Blood sugar	CO_2
63	Gangrene of foot	Ethylene 45 minutes	133	50.4	148	50.4 (2 hr.)
73	Gangrene of foot	Ethylene 30 minutes	182	80.5	105	54.1 (1 hr.)
63	Gangrene of leg	Ethylene 65 minutes	117	51.3	110	53.2 (2½ hr.)
73	Gangrene of leg	Ethylene 45 minutes	103	53.2	133	48.6 (2 hr.)
60	Tonsillectomy	Ethylene 1 hour	80	50.4	200	46.7 (1¼ hr.)
52	Appendectomy	Ethylene	60	54.0	190	50.0 (2 hr.)
20	Mastoidectomy	Ethylene 30 minutes	71	56.0	76	57.9 (2 hr.)
50	Incision of finger abscess	Ethylene 4 minutes	105	48.0	117	53.2 (2 hr.)
59	Gangrene of leg	Ethylene 1 hr. 45 min.	286	35.3	238	35.3 (1 hr.)
62	Lap. for carcino- ma of pancreas	Ethylene 30 minutes	190	43.8	200	45.3 (1½ hr.)
58	Hysterectomy for carcinoma of uterus	Ethylene 40 minutes	210	50.4	444	37.2 (2½ hr.)
16	Induction of la- bor at 5½ mos.	Ethylene	100	35.6	91	40.3 (1 hr.)
58	Cholecystotomy	Ethylene 68 minutes	83		172	31.5 (immed.)
55	Nephrectomy	Ethylene 2 hrs. 20 min.	110	52.0	400	42.0 (1½ hr.)
73	Gangrene of foot	Gas-ether	296	39.0	332	76.0 (1 day)
52	Mastoidectomy	Ether-oxygen	74	50.4	200	45.8 (3 hr.)
51	Removal of breast	Nitrous oxide 32 minutes	211	54.0	400	43.8 (1 day)

* Time given in this column = time post-operative at which blood specimen was taken.

Fourteen were given ethylene gas, 2 ether, and 1 nitrous oxide and oxygen. The tables will show the CO₂ combining power taken before the administration of the anesthetic and at various times subsequent to its cessation, usually from one hour to 2 hours after completion of the operation. The patients were prepared for the operation wherever possible by appropriate diet and insulin so that they would come to the operation approximately as normal individuals without ketosis and hyperglycemia. This was not in every case possible and it will be observed that in a number of instances the blood sugar was abnormally high at the time of the operation. The method used included the administration of an extra carbohydrate feeding and insulin dose about 6 or 8 hours before the operation and during the course of the anesthetic the administration of 20 cc. of 50% glucose intravenously with from one to 2 units of insulin per gram of glucose. The insulin was given hypodermatically. It will be observed that usually the general anesthetic caused no change in the level of the CO₂ combining power. This corresponded to the clinical picture for there was no evidence of acidosis. It will be observed also that the level of the blood sugar at the time of the anesthesia was immaterial. Equally good results were obtained with high blood sugar levels as with low. The pH was not determined.

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Experiments on the Effect of Di-hydranol on Intestinal Protozoa of Man and Laboratory Mammals.

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Leonard and his associates (Leonard,¹ Leonard and Frobisher,² Hampil³) have demonstrated the bactericidal properties of the acyl and alkyl derivatives of resorcinol and Ratcliffe⁴ has shown that the administration of certain of these derivatives to rats not only changes the intestinal flora from a Gram-positive to a Gram-negative type but also is effective in reducing the protozoa in the cecum

¹ Leonard, V., *J. Urol.*, 1924, xii, 585.

² Leonard, V., and Frobisher, M., *J. Urol.*, 1926, xv, 1.

³ Hampil, B., *J. Inf. Dis.*, 1928, xliii, 25.

⁴ Ratcliffe, Herbert L., *Am. J. Hyg.*, 1929, x, 643.