

blood of its urea content per minute in comparison with the 13.62 cc cleared by the opposite normal kidney. Over a period of 2 hours, the operated kidney excreted 45% of the injected phenolsulphonphthalein compared with the excretion of 27.5% from the opposite normal kidney. The intravenous injection of 10 cc of 20% urea solution produced a greater diuresis from the kidney with the accessory circulation than from the unoperated kidney.

The data here presented suggest that the experimental production of an accessory blood supply to the kidney is practicable. Such an additional blood circulation may have a functional value, inasmuch as diuresis, urea clearance, and phenolsulphonphthalein excretion are somewhat greater from a kidney provided with such an extra blood supply, as indicated by preliminary renal function tests. Further evidence of the establishment of an additional blood circulation by the outlined operation is provided by the fact that the injection of 10 cc of a 1% solution of methylene blue into the femoral vein produces a diffuse staining of the renal parenchyma after ligation and division of the renal artery, provided that an accessory blood supply is maintained to the kidney through the omentum.

Conclusion. An operation is described for the production of an accessory blood supply to the kidney by the way of the omentum. The effects of the procedure in 11 dogs are described.

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Concentration of Sulfanilamide in Spinal Fluid and Blood Following Single Intrathecal Injection of Drug.

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Sulfanilamide, which is successfully used in the treatment of patients suffering from purulent meningitis due to beta-hemolytic streptococcus and meningococcus, is readily absorbed after oral administration and is found in the blood and spinal fluid; usually, the concentration in the spinal fluid is somewhat lower than in the blood (Marshall, Emerson, and Cutting^{1, 2}). Some authors, including

¹ Marshall, E. K., Emerson, K., and Cutting, W. C., *J. Am. Med. Assn.*, 1937, **108**, 953.

² Marshall, E. K., Emerson, K., and Cutting, W. C., *J. Pharm. and Exp. Therap.*, 1937, **61**, 196.

Schwentker, Gelman and Long³ as well as Crawford and Fleming⁴ recommend that sulfanilamide may be given in certain cases by intrathecal injection. This form of administration is indicated particularly when treatment by other routes is not successful. It seemed desirable to determine what concentrations of sulfanilamide are reached and maintained in spinal fluid and in blood following intrathecal injection of the drug. In the following note, observations are reported dealing with this problem.

The studies were carried out in the following manner: Patients on whom a lumbar puncture was indicated for diagnostic reasons and whose spinal fluid was found to be normal, were given intrathecally 10 cc of an 0.8% solution of sulfanilamide (Prontylin, repurified for injection, Winthrop) in physiological saline solution. Four and 18 hours following this injection, lumbar punctures again were performed, and at the same time blood specimens were taken. The concentration of sulfanilamide in both spinal fluid and blood, was determined according to the method described by Marshall, Emerson and Cutting¹; 2 standard solutions, containing 10 mg % and 1 mg % of sulfanilamide respectively were used.

TABLE I.
Concentration of Sulfanilamide in Spinal Fluid and Blood Following a Single Intrathecal Injection of 80 mg of Sulfanilamide.

Hrs following administration of sulfanilamide	Concentration of Sulfanilamide in mg % in			
	Spinal Fluid		Blood	
	Case I	Case II	Case I	Case II
(a) 4	11.2	16.2	0.7	trace
(b) 18	negative	trace	negative	negative

Negative = no sulfanilamide demonstrable.

Trace = less than 0.1 mg %.

The results obtained in 5 patients were essentially the same. Table I presents the findings of 2 of the cases. It may be seen from this table that 4 hours after the intrathecal injection of 80 mg of sulfanilamide a relatively high concentration (10-16 mg %) of the drug is present in the spinal fluid, but that the concentration in the blood at this time is much lower; in our series, the concentration of sulfanilamide in the blood amounted to 1 mg % or less. Eighteen hours following a single intrathecal injection of 80 mg of sulfanilamide, the concentration in both spinal fluid and blood was very low or the drug could not be demonstrated at all. It is obvious that

³ Schwentker, F. F., Gelman, S., and Long, P. H., *J. Am. Med. Assn.*, 1937, **108**, 1407.

⁴ Crawford, T., and Fleming, G. B., *Lancet*, 1938, **1**, 987.

variations in the concentration of sulfanilamide in different individuals are to be anticipated, since the resulting concentration of the drug depends not only upon the dosage given but also upon the weight of the individual, the amount of spinal fluid present, the intake of fluids, the efficiency of the kidney function, and so forth. The data presented may possibly serve as an aid in the treatment of purulent meningitis and may point to certain advantages and disadvantages of the intrathecal administration of sulfanilamide. Observations in cases of meningitis concerning the concentration of sulfanilamide in blood and spinal fluid, following a single intrathecal injection were not carried out for obvious reasons, nor was the concentration of sulfanilamide in cerebro-spinal fluid obtained by cisternal puncture determined. It is possible, as Dr. E. K. Marshall, Jr.,⁵ suggested that the concentration of the drug is lower in the cisternal fluid than in spinal fluid.

From the observations presented above it may be concluded that: (1) It is possible to obtain a relatively high concentration (10-16 mg %) of sulfanilamide in the spinal fluid 4 hours after a single intrathecal injection of 80 mg of sulfanilamide to patients free of meningitis; (2) The drug is readily eliminated from the spinal fluid of these patients within 18 to 24 hours. (3) The concentration of sulfanilamide in the blood at the periods of observation is relatively low (1 mg % or less).

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Comparative Nutritive Value of Firm and Watery Egg Albumen.*

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The question of egg quality has become a matter of economic concern to the producer, the distributor and to the consumer. Investigators who have attempted to study this problem have been unable to agree as to what constitutes egg quality. Needless to say this lack of agreement has been a considerable handicap to researches along this line. However, in spite of this lack of agreement as to the characteristics of quality, eggs with excessive amounts of watery

⁵ Marshall, E. K., Jr., personal communication.

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