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A blood sugar tolerance test.

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Various objections may be made to methods now in vogue for sugar tolerance determinations which depend on the appearance of sugar in the urine. Much more reliable, instructive and delicate results can be obtained by a study of the hyperglycemic response of the blood to ingested sugar. When pure glucose is administered in amounts equal to $1\frac{3}{4}$ gm. per kgm. body weight in 40 per cent. aqueous solution to fasting patients, alimental absorption is so regular that a normal hyperglycemic curve can be established. The blood sugar reattains its fasting level $1\frac{1}{2}$ to 2 hours after the sugar is taken. The oral method of administration is therefore much more certain than has been supposed.

For clinical purposes the test is carried out by first determining by Epstein's modification of the Lewis and Benedict method, the blood sugar of a patient who has fasted over night, then administering the sugar drink as prepared above, with the addition of the juice of a lemon and again determining the blood sugar at the end of two hours. In normal subjects the blood sugar has by this time returned to its fasting level. If hyperglycemia still persists, the blood sugar tolerance is lowered. This is the simplest form to which the technique is reducible. We prefer to make several half hourly or hourly observations of the blood sugar follow-

ing glucose ingestion also to determine the presence and amount of sugar voided in the urine during these determinations and in the complete twenty-four-hour specimen.

Glycosuria, which is normally absent under the conditions of the test, is not a necessary accompaniment of decreased tolerance. A normal blood sugar curve accompanied by glycosuria usually indicates renal diabetes. We have also found this test useful in the diagnosis of incipient diabetes. All cases of Graves' disease examined, and certain of chronic interstitial nephritis, show a prolonged blood sugar curve. Hypo-endocrine conditions such as cretinism and muscular dystrophy[1] are characterized by increased sugar tolerance with the ordinary urinary test, but blood sugar determinations showed hypoglycemia and a delayed tolerance curve. Evidently the hypoglycemia accounted for the contrary result obtained by the usual test. In view of these findings former clinical observations on sugar tolerance require revision.

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The inversion and determination of cane sugar.

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Sucrose is completely inverted by heating in a solution of picric acid. This fact has been made use of in the estimation of cane sugar in solutions and extracts. After the cane sugar is hydrolyzed by heating with picric acid under properly controlled conditions, the invert sugar formed is determined by a modified Lewis-Benedict colorometric method. Glucose and fructose are determined at the same time.

The technic of the method is as follows: 1 c.c. of the clear liquid containing the sugars is transferred to each of two graduated narrow test tubes containing 2 c.c. saturated solution of picric acid. One of the tubes also contains 1 c.c. 20 per cent. sodium carbonate. The two tubes are then immersed into a bath of boiling water. After ten minutes 1 c.c. of 20 per cent. sodium

[1] Janney, N. W., Goodhart, S. P., and Isaacson, V. I., *Arch. f. Int. Med.*, article in course of publication.