

## 10049 P

## Studies in Skin Distensibility.

WILLIAM A. SODEMAN AND GEORGE E. BURCH. (Introduced by J. H. Musser.)

*From the Department of Medicine, School of Medicine, Tulane University of Louisiana, and the Charity Hospital of Louisiana, New Orleans.*

Heretofore there has been no simple adequate quantitative method for the estimation of skin distensibility. The importance of such data in an understanding of the pathologic physiology of edema and in an objective estimation of the results of therapeutic procedures in scleroderma is self-evident. The following method has proved simple and satisfactory. Two 4.8 mm bakelite cubes were sealed to the skin with collodion at a distance of 5 cm from each other. A steel spring caliper of known calibration was articulated at its tips with the bakelite cubes and when released spread the cubes apart with a force of approximately 100 g. The distance between the cubes was then measured and the distension expressed in mm of stretch per cm of skin per 100 g of force.

Determinations have been made in 13 normal subjects for the pretibial area, dorsum of the foot, abdomen, volar surface of the forearm and the dorsum of the hand, and the mean values were found to be 0.31, 0.59, 2.07, 0.93 and 1.34 mm/cm/100g, respectively. All females were nulliparous. The skin was found

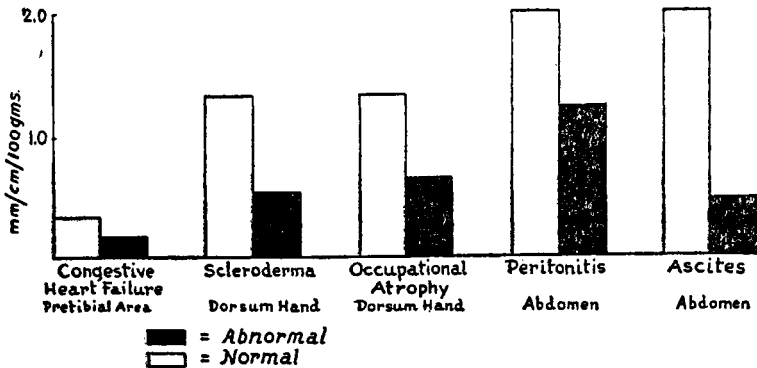


FIG. 1.

Mean skin distensibility values in normal and abnormal subjects.

to be less distensible in the lower extremities, varying inversely with the tissue pressure.<sup>1</sup> This regional variation appears

<sup>1</sup> Burch, G. E., and Sodeman, W. A., *J. Clin. Invest.*, 1937, **16**, 845.

to be of physiologic significance in the prevention of edema of the feet on assuming the erect position. Repeated determinations showed comparable results from day to day.

Forty-three determinations have been made on 21 patients with the following states: scleroderma 4, occupational atrophy 3, ascites 4, peritonitis 2, edema 8 (cardiac 6, venous obstruction 1, pernicious anemia 1). Comparison of the mean values in the patients with those in the normal subjects is illustrated in Figure 1. In scleroderma a diminution in distensibility was found to parallel the severity of the disease. Values for the dorsum of the hand ranged from 0.47 to 0.55 (mean 0.50), contrasting with the normal range of 0.66 to 2.04 (mean 1.34). This method is being used to follow quantitatively the progress of the disease and to evaluate therapeutic procedures.

In congestive heart failure the distensibility was found to decrease as the edema increased, reaching, in one patient, the limit of distensibility. Similar findings occurred in other types of edema.

*Summary.* A simple method has been devised for the measurement of skin distensibility. Its application to the study of the physiology of the skin in edema and abdominal swellings is being made. Its importance as an objective method in following, quantitatively, the progress of scleroderma and other skin changes, as well as objectively evaluating the therapeutic procedures applied to these diseases is evident.

## 10050

### The Ammonia Mechanism in Alkalosis Due to Overventilation.

A. P. BRIGGS.

*From the Departments of Biochemistry and Internal Medicine, University of Georgia School of Medicine, Augusta, Georgia.*

It has been taught<sup>1</sup> that production of ammonia by the kidneys is increased for excretion of acid which would otherwise carry off essential basic elements; and that ammonia formation is suppressed in states of alkalosis when it is desirable for the body to be rid of excess fixed base. My own observations<sup>2,3,4</sup> have convinced me that

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<sup>1</sup> Peters, J. P., and Van Slyke, D. D., *Quantitative Clinical Chemistry*, Vol. I, Interpretations, Williams and Wilkins, Baltimore, 1931, p. 372.

<sup>2</sup> Briggs, A. P., *Arch. Int. Med.*, 1932, **49**, 56.

<sup>3</sup> Briggs, A. P., *J. Biol. Chem.*, 1934, **104**, 231.

<sup>4</sup> Briggs, A. P., *Arch. Int. Med.*, 1937, **60**, 193.