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A modification of the Du Bois height-weight formula for surface areas of newborn infants.

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In 1916 Sawyer, Stone and Du Bois announced a series of measurements by which the surface area of adults and children could be estimated with an average error of 1.3 per cent. In a subsequent paper of the same series (1916) by Du Bois and Du Bois, a new formula based on height and weight alone was presented which was stated to have an error of ± 5 per cent. This formula is as follows:

$$A = W^{.425} \times H^{.725} \times C,$$

or

$$\log A = \log W \times .425 + \log H \times .725 \times \log C.$$

The constant C was found to be 71.84 (log 1.857).

It was not known whether the formula held for children under two years.

Since the first method is based on a separate estimation of the surfaces of the extremities, head and trunk there seems to be no reason why this method should not be applicable at any age. The height-weight formula should however apparently be checked for young infants.

In a series of 100 newborn babies, none over 12 days old, ranging in weight from 2,140 to 4,520 grams and in height from 45.2 to 56.9 cm., the surface area was measured by the Sawyer, Stone and Du Bois method and compared with the results obtained by the height-weight formula of Du Bois and Du Bois. Taking the former as the correct measure, we found that the latter showed a constant deviation below the former which averaged 191 sq. cm. or a mean error of − 8.6 per cent. Correcting the constant, it was found that the surface area could be computed in these infants by the height-weight formula with an average error of ± 2.5 per cent.

For newborn infants the corrected formula is as follows:

$$A = W^{.425} \times H^{.725} \times 78.50,$$

or

$$\log A = \log W \times .425 + \log H \times .725 + 1.895.$$

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On the relation of blood-volume to the nutrition of the tissues.

I. The effects of hemorrhage and intravenous injections of gum-saline on the response to the administration of a mixture of carbon dioxide and room air, and of room air alone.

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At the last meeting of the American Physiological Society some experiments were reported on the effects of hemorrhage on the response to a gradual reduction in the percentage of oxygen in the respired air. These experiments were performed on the normal unanesthetized dog connected by means of a mask with a rebreathing apparatus arranged to absorb the carbon dioxide of the expired air as the oxygen was consumed. The purpose of the experiments was to determine the detrimental effects of hemorrhage and the subsequent effects of replacing the lost blood with a gum-saline solution.

We reasoned that if a normal percentage of hemoglobin and a normal flow of blood are essential for a normal gaseous exchange, that the response of an animal to a reduction in the percentage of oxygen in the respired air would be altered by hemorrhage; and further that if the intravenous injection of gum-saline accelerated the volume-flow of blood out of proportion to the accompanying dilution, the reduced tolerance to low pressures of oxygen would be improved.

To our surprise we were unable to detect, with the methods employed, any decrease in tolerance after hemorrhage amounting to 3 per cent. of the body weight. We do not attempt to definitely explain these results as yet, but wish to point out a striking effect