

## Short communication

### **On-line measurements of body fat content by the caliper method**

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The Harpenden caliper is a widely used instrument for measuring skinfold thickness to estimate the total body fat content (3). Usually four skinfolds are measured: biceps, triceps subscapular and suprailiac (2). For the estimation of the total body fat content formulae (1) based on the results of Durnin and Womersley (1974), can be used. These formulae allow to calculate, separately for females and males, the body fat content with infinitely variable influence of age between 15 and 65 years.

The accuracy of the results obtained with the caliper method depends on individual factors of the investigator. However, numerous time-consuming steps may cause further errors. In accordance with previous results (5, 6, 7) we developed an on-line system which takes a reading two seconds after the beginning of each measurement by releasing the caliper handle (6), calculating and printing the values including differences from desirable values, based on subjects with normal (Broca index) and ideal (MLIC standards) body weight (5) (fig. 1).

The original mechanical measuring instrument was replaced by an active displacement transducer and connected via an analog/digital transformer to a simple home computer (fig. 2). A special machine code program realizes the software-like voltage transformation. The other part of the program written in Basic regulates the process of the measurement and the conversion. Another selectable part of the program makes it possible to take the measurements through clothing by subtracting the measured clothing thickness from the measured value, corresponding to previous results (4).

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\* This short communication includes parts of a medical dissertation.

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PROBAND  14          06.11.1985
SEX:      FEMALE
AGE:      22 YEARS
SKINFOLD THICKNESS:
                16.69 MM
                10.86 MM
                11.93 MM
                22.61 MM
TOTAL:          62.11 MM

BODY FAT CONTENT: 29.26 P.C.
DEVIATION FROM BROCA: -2.1 P.C.
DEVIATION FROM MLIC:  2.7 P.C.
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Fig. 1. Example of the printed protocol.

In series of clinical tests our device has proved to be very efficient. Therefore this concept can be recommended to improve the accuracy of the caliper method in diminishing reading and calculation errors. Furthermore, this method allows the taking of each measurement and complete calculation of body fat content in less than one minute, which is very advantageous for serial tests.

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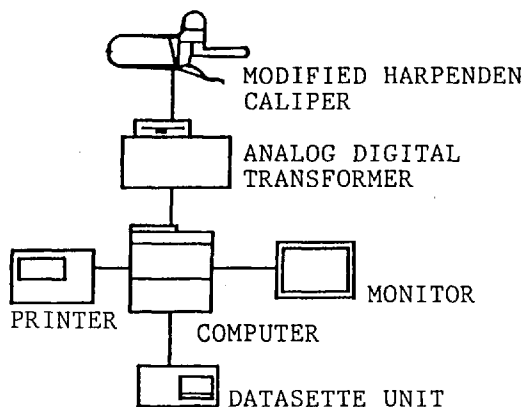


Fig. 2. Scheme of device.

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