We concluded that QAPSE had demonstrated excellent repeatability and good validity for physical fitness and anthropometric data in an elderly population. This questionnaire investigated important dimensions of elderly people’s activity and provided a good estimation of usual DEE for that age group.

Validation of impedancemetry measurements of body composition in the elderly. C Vache 1, N Fellmann 2, M Ferry 3, J Coudert 3, B Beaufrère 1, P Ritz 1 (1 Laboratoire de nutrition humaine; 2 Laboratoire de physiologie et de biologie du sport, CRNH-Auvergne, Clermont-Ferrand; 3 Service de geriatrie, hopital de Valence, Valence, France)

Significant body composition changes occur with ageing that make it necessary to reappraise the relevant measurement techniques. The density of lean body mass (LBM) decreases with age. This generates biases in densitometric methods. The hydration of LBM varies little with age; therefore, total body water (TBW) is a good parameter for estimating body composition in the elderly. Estimates of TBW with impedancemetry has not been properly validated in the elderly, both for low (< 500 kHz) and high (> 500 kHz) current frequencies. In particular, the only published equations [Deurenberg (1990) Am J Clin Nut] overestimate fat mass by about 7%. The aim of the present study was therefore to perform such a validation, the reference technique for measuring TBW being 18O dilution.

TBW was measured by 18O dilution in 40 healthy volunteers (19 women, 21 men), aged 67.7 ± 5.0 years (mean ± SD). 18O dilution space was calculated from the plasma isotopic plateau achieved after the dose was given orally. Resistance (R), reactance (Xc) and impedance (Z) were measured at two frequencies (50 and 100 kHz) with an Analycor3 impedancemeter (Eugedia, France).

TBW (18O dilution) was 34.78 ± 6.74 kg. At 50 kHz, R was 491.1 ± 71.5 Ω and Xc was 42.8 ± 6.6 Ω. At 100 kHz R was 478.6 ± 70.0 Ω and Xc was 32.7 ± 5.5 Ω.

Multiple regression models that minimize the standard error of the estimate (SEE) involved three variables: i) the ratio of height2 over impedance (H2/Z, in cm2.Ω−1), ii) weight (W, in g), iii) gender (S) as a discrete variable (women = 0, men = 1).

Corresponding equations were:

- at 50 kHz,
  
  \[
  \text{TBW (g) } = 343.2 \frac{H^2}{Z} + 0.175 W + 2891.2 \quad \text{SEE } = 1556.3
  \]
  \[
  r^2 = 0.951, \quad \text{SEE} = 1556.3
  \]
  
- at 100 kHz,
  
  \[
  \text{TBW (g) } = 339.9 \frac{H^2}{Z} + 0.168 W + 2638 S + 1975.4 \quad \text{SEE } = 1490.0
  \]
  \[
  r^2 = 0.955, \quad \text{SEE} = 1490.0
  \]

In conclusion, specific equations were derived that describe TBW in the elderly from impedances at either 50 or 100 kHz. Precision (SEE) of TBW estimates with such models were 1556 g (4.5%, 50 kHz) and 1490 g (4.3%, 100 kHz).

Evaluation of weight gain composition using DXA in preterm infants fed HM fortifier or two different preterm formulas. K Nyamugabo, F Studzinski, J Rigo (University of Liege, Neonatal Unit, bld XIIe de Ligne 1, 4000 Liege, Belgium)

Recently reproducibility, accuracy and precision of dual X-ray absorptiometry (DXA) measurements were determined in newborn piglets suggesting that bone mineral content and fat content could be easily evaluated in small subjects. Reference values were also determined at birth in preterm and term infants appropriate for gestational age (n = 107) with body weight ranging from 1 100 to 3 800 g. The aim of the present