References

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Dr R. H. R. White comments:

It is difficult to compare our findings with those of Dr Choudhry in the absence of more detailed information regarding (1) the age range of the patients dialysed, which Dr Day and I found influenced the infection rate, and (2) the causes of renal failure, which would have some bearing on the duration of dialysis. However, we would not disagree with his view that removal of the cannula after a short period of continuous dialysis might reduce the incidence of infection; indeed we suggested that this might be the case but felt that, since reinsertion of the cannula is an unpleasant experience for the child, such perfection might not always be practicable.

In our hands early detection and treatment of infection had a successful outcome except in one child with rapidly progressive glomerulonephritis, whose *Candida* peritonitis contributed to death at a time when we had no facilities for haemodialysis and transplantation in children.

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Assessment of total body fat in infancy from skinfold thickness measurements

Sir,

We have read the paper by Dauncey *et al.* (*Archives*, 1977, **52**, 223) and wish to make a few comments. In their paper these authors have related subcutaneous fat layer to skinfold thickness. They refer to the study by Hammond (1955) which examined the relation between uncompressed fat thickness T measured by *x*-ray and skinfold thickness S measured by calipers. Hammond finds that $T = 0 \cdot 95S - 0 \cdot 0074S^2$. For the range values encountered in the newborn, i.e. $S \approx 5$ mm, Hammond's results (Tables IV and V) show $T = S - 0 \cdot 3$ mm. If we regard θ as representing the true uncompressed subcutaneous fat thickness, i.e. T less the thickness of the dermis, then $\theta = T - 1$; using Dauncey's value for thickness of the dermal layer (1 mm). Hence $\theta = S - 1 \cdot 3$ mm.

Dauncey *et al.* graph S against T using Hammond's data (see curve B, Figure), and by allowing 1 mm for the dermis derive curve C which relates subcutaneous fat to compressed skinfold thickness. Then, by assuming that subcutaneous fat is 2 mm less than the skinfold thickness they show a line A, $\theta = S - 2$, and claim that, since line A lies fairly close to curve C, there is some justification for the empirical relation they have used to derive uncompressed fat thickness. In fact, as shown in our Figure, the line A_1 with the equation $\theta = S - 1 \cdot 3$ is a better fit to the data which produce curve C since most of Hammond's observations occur with $4 \cdot 5 < S < 7$; that is within the region of contact of the curve and the straight line. We therefore believe that Dauncey *et al.* are in error in using $\theta = S - 2$. As shown in our first paragraph θ is, in fact, $S - 1 \cdot 3$.

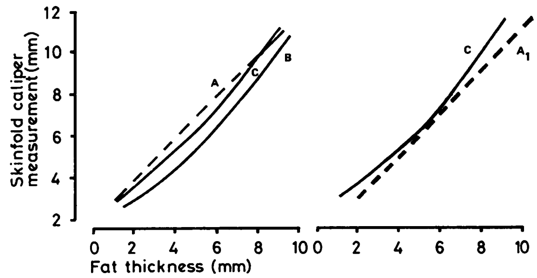

Figure *Thickness of subcutaneous fat θ related to skinfold thickness S measured by calipers. Line A, equation $\theta = S - 2$ (Dauncey et al., 1977); curve B from Hammond's data; curve C, allowing 1 mm for the thickness of the dermis; line A_1 equation $\theta = S - 1 \cdot 3$.*

Hammond's work shows that the Harpenden caliper, exerting as it does a constant force of 10 g, compresses a fold of skin to almost half its uncompressed value. Just as the calipers compress the fat layer by a factor of almost two, so they also compress the dermis. Knowing this, one would empirically suggest that the true uncompressed subcutaneous *fat* is 1 mm less (two thicknesses of compressed dermis) than the reading given on the calipers while compressing the fold of skin.

We, therefore, recommend that in using the body fat formula derived by Dauncey *et al.* one should use $\theta = S - 1 \cdot 3$.

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Drs Dauncey and Gairdner comment:

We are unable to agree with Richards and De Souza's reasoning for several reasons. Their choice of the figure of 5 mm for the skinfold thickness of newborns is questionable since Hammond's data were for children over 2 years.

Hammond gives two equations (pp. 206 and 207) for the relationship between uncompressed fat thickness and skinfold thickness as measured by caliper, not just '$T = 0 \cdot 95\ S - 0 \cdot 0074\ S^2$'. The results quoted from Hammond's Tables IV and V refer to 2-year-olds where S is not 5 mm but a mean of 6·38 mm (at 6 sites) for boys and 8·15 mm (at 2 sites) for girls. Thus, Hammond's data for the relationship between T and S does not lead to '$T = S - 0 \cdot 3$ mm' but to $T = S - 0 \cdot 4$ mm and $T = S - 0 \cdot 69$ mm for boys and girls respectively.

Richards and De Souza conclude that the linear relationship $\theta = S - 1 \cdot 3$ (line A_1) 'is a better fit to the data which produce curve C'. However, they are only concerned with skinfold values between 4·5 and 7 mm whereas our values of triceps and subscapular skinfolds ranged from 2·2 mm (in some preterm infants) to 12·8 mm, a large part of our data referring to values between 7 and 10 mm. For these values of S it can be seen that line A is closer to curve C than is line A_1, although there are inevitable limitations in trying to fit a straight line to a curve.

While it would be unreasonable to expect any very close relationship between skinfold thickness and thickness of subcutaneous fat—as indeed Hammond's Fig. 4 makes evident—the formula which we used seems to accord with the few facts available.

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