Pädiatrisch–Endokrinologisches Zentrum Zürich

Body composition measures on different DEXA machines are not the same

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Background:

Body composition measures differ between DEXA scanners. If an old DEXA is replaced, a transition period for double measurements on the old and the new scanner is needed.

Objective:

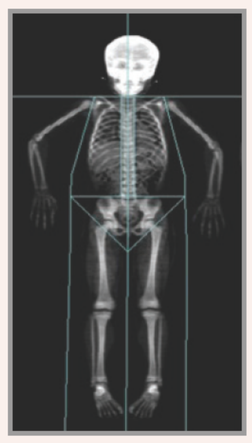
To evaluate differences between the old (Hologic QDR 2000) and new (Hologic Discovery Wi) scanner and to calculate formula transforming measurements.

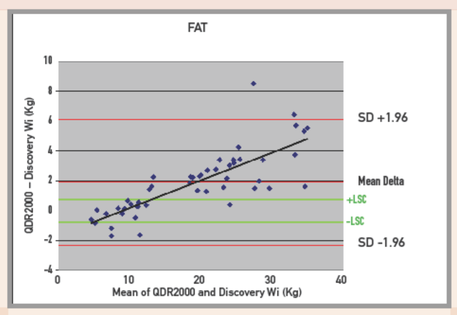
Method:

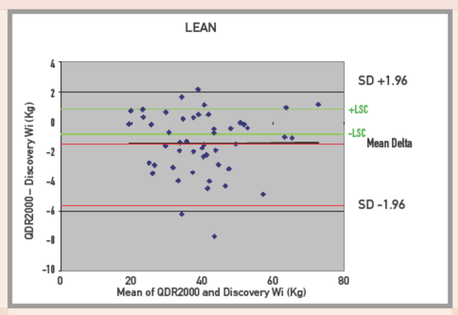
51 double measurements were performed on a group of 41 children and adults (mean (SD) age 18.57 (10.06 y) Results for fat, lean, BMD and BMC were compared using Bland-Altmann plots. Linear regression analysis was used for transformation formula. Least significant change (LSC) was calculated using triple measurements of a separate group of 15 healthy adults.

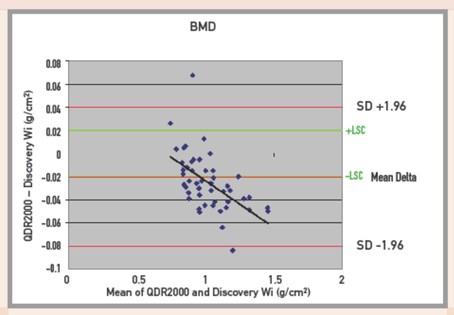
Results:

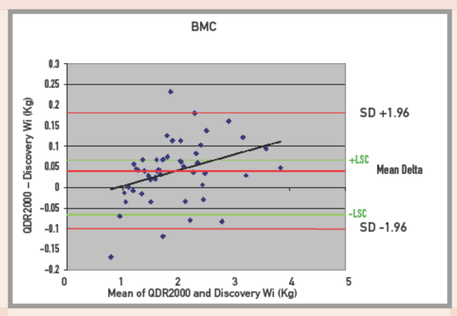
	LSC	Individual Mean QDR / Dis. Wi	Mean Δ QDR - Dis. Wi (+/- 2SD)
Fat	0.76 kg	4.6 – 34.9 kg	1,9 (4.3) kg
Lean	0.83 kg	19.2 – 72.7 kg	-1.5 (4.2) kg
BMD	0.002 g/cm²	4.6 – 34.9 kg	-0.02 (0.06) g/cm²
BMC	0.065 kg	0.78 – -3.8 kg	0.04 (0.14) kg

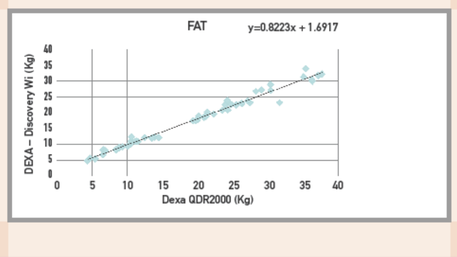


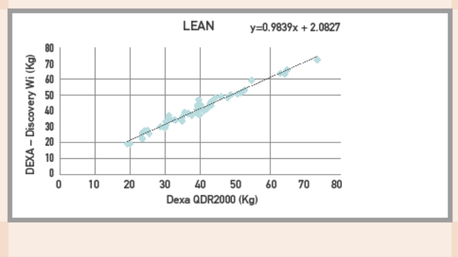


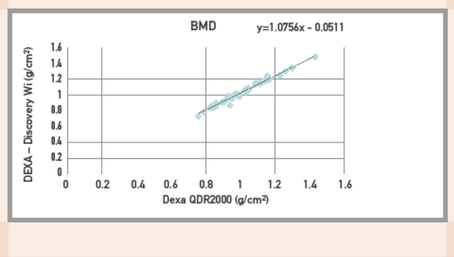


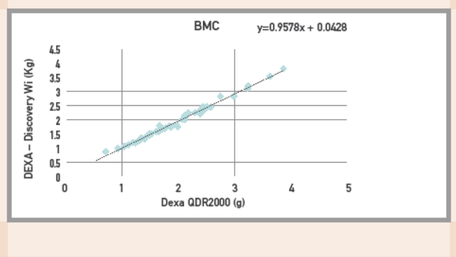












Using transformation formula, maximum differences between true and calculated measurements for fat, lean, BMC and BMD are 11.8 %, 12.8 %, 11.9 % and 22.5 % respectively.

Conclusions:

Except for BMC and BMD, differences between the DEXA scanners exceed LSC (Least significant change) 2 to 7 fold. Exchanging DEXA scanners, an overlapping period with double measurements is mandatory. Transforming formulas induce significant variability.

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