



# Comparison of 3 indirect calorimetry devices

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## Introduction

- Indirect calorimetry was performed for a long time with the Deltatrac II device (Datex Engström, Finland), considered as a reference but no longer produced. 2 new calorimeters are available but not compared with Deltatrac II : Quark RMR (Cosmed, Italy) and CCM Express (MedGraphic, USA).
- Aim : to compare resting energy expenditure (REE) between the 3 devices and REE measured by different methods of gas collection, i.e.canopy, face tent of mask with the CCM Express

## Methods

- 24 subjects (16 women, 10 men), age range 27 – 76 yrs, BMI range 18.1 – 42.0 kg/m<sup>2</sup>.
- REE measured consecutively 10 min with each device in random order. The measurement with the first device was repeated at the end of the sequence and the average of both values considered.
- REE measurement with the CCM Express were performed by using Canopy (CCMC), Face tent (CCMF) and mask (CCMM)
- Comparison of the 3 devices : Bland-Altman test ; comparison of measurements done with CCM Express : Anova for repeated measures and paired-T-test

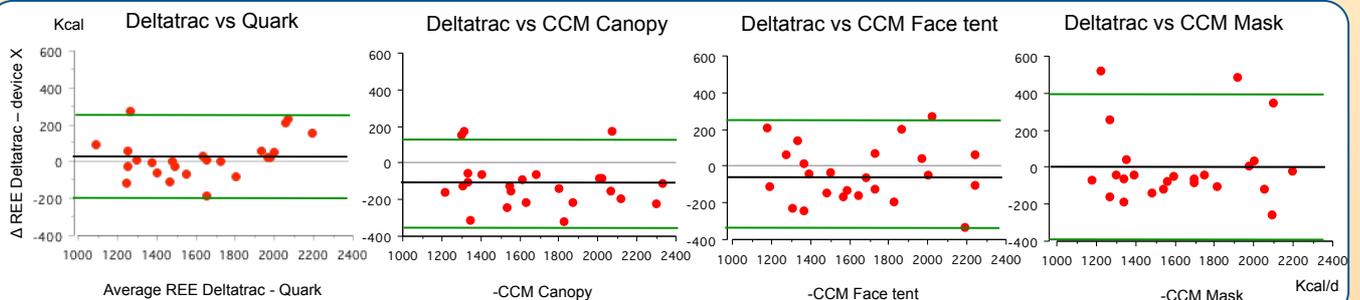
## Results

- Predicted REE (Harris-Benedict) was 1482 ± 261 kcal/d (mean±SD).
- REE measurements by CCMC, CCMF and CCMM were significantly different (p=0.012).
- CCMC was different from CCMM (p=0.0052) and from CCMF (0.02) and overestimated REE vs Deltatrac II.
- There was no difference between CCMM and CCMF.

VO<sub>2</sub>, VCO<sub>2</sub> and REE differences between Deltatrac and Quark or CCM

	VO <sub>2</sub> (L)	VCO <sub>2</sub> (L)	REE (kcal/d)
<b>Deltatrac-Quark</b>	5 ± 32	6 ± 42	23.7 ± 220
<b>Deltatrac-CCMC</b>	-12 ± 42	-3 ± 40	-110 ± 260
<b>Deltatrac-CCMF</b>	-3 ± 50	7 ± 32	-42 ± 300
<b>Deltatrac-CCMM</b>	0.04 ± 50	10 ± 48	5 ± 400

Bland – Altman test: mean ± 2SD



## Conclusion

- Quark RMR measures REE with the same precision as Deltatrac II but with a large variability.
- CCM Express overestimates VO<sub>2</sub> and consequently REE, and shows also a large variability.
- We have observed large differences and variability with available gas collection method (CCMC, CCMF, CCMM) which needs further evaluation and standardization.