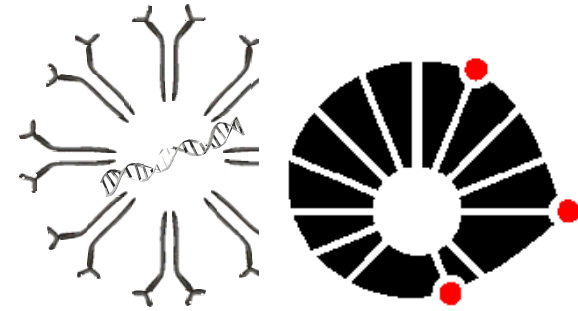


**Universidade Estadual de Campinas**



# **Métodos de Avaliação da Composição Corporal**

**Dennys Esper Cintra**

Laboratório de Genômica Nutricional

Laboratório de Avaliação Nutricional



# Padrão “Ouro” em Avaliação Corporal/Antropométrica

# DEXA

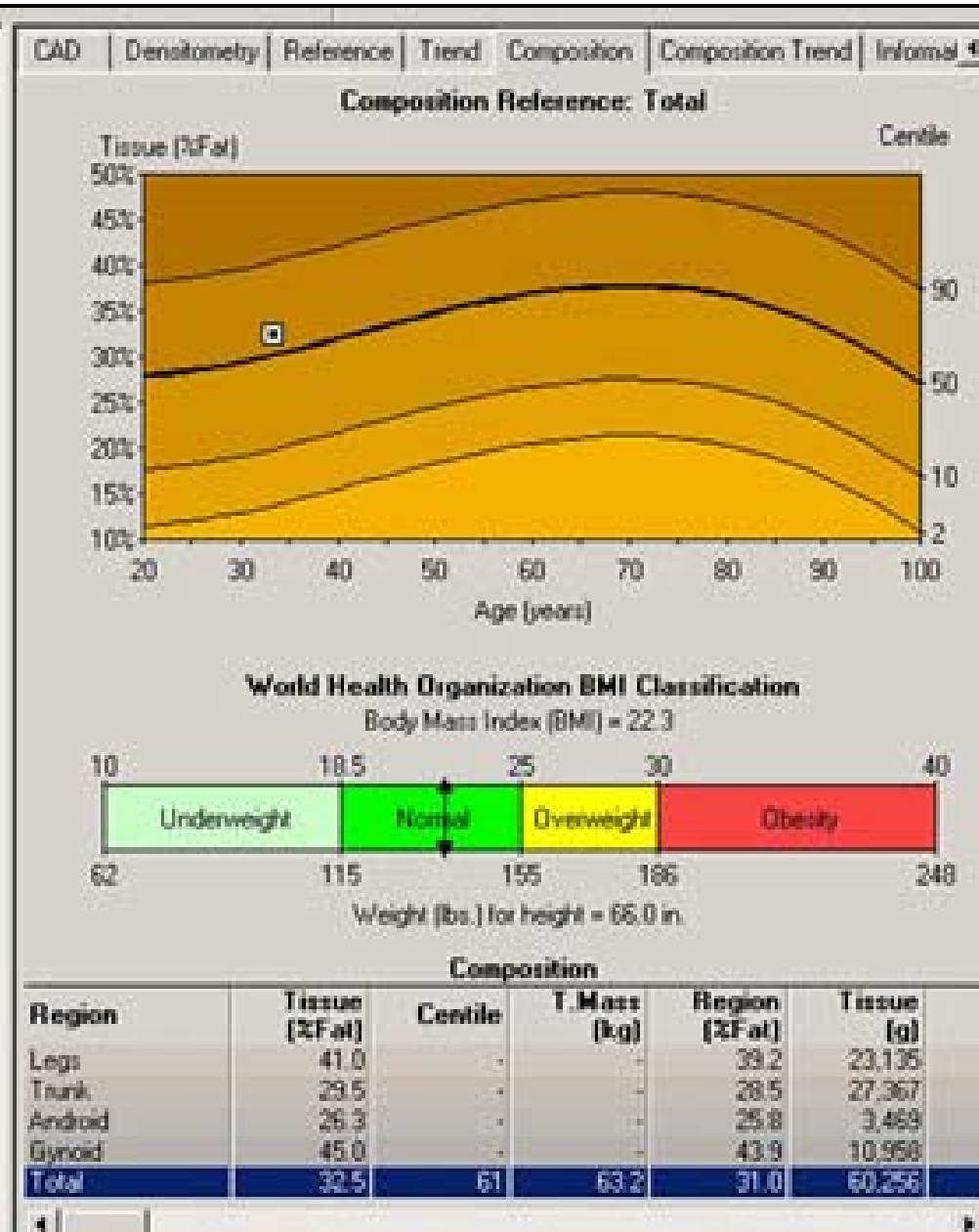
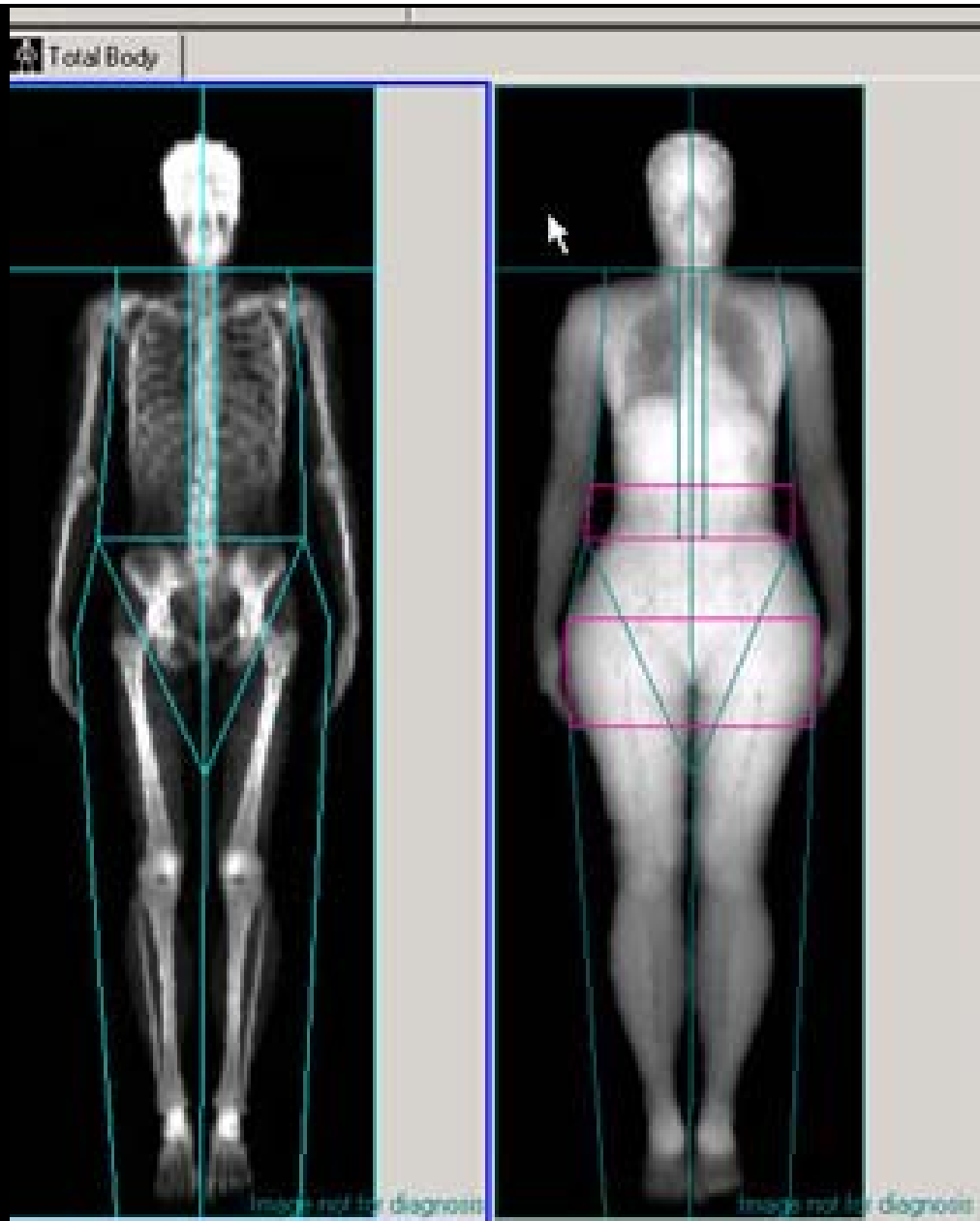
Absorptiômetro de Dupla Energia de Raios X

Heymsfield SB, Basic Life Sci. 1990; 55:327-37.

Heymsfield SB, Infusionstherapie. 1990; 17 Suppl 3:48-51.



Não  
separa  
adiposo  
Sub-  
cutâneo  
de  
visceral!

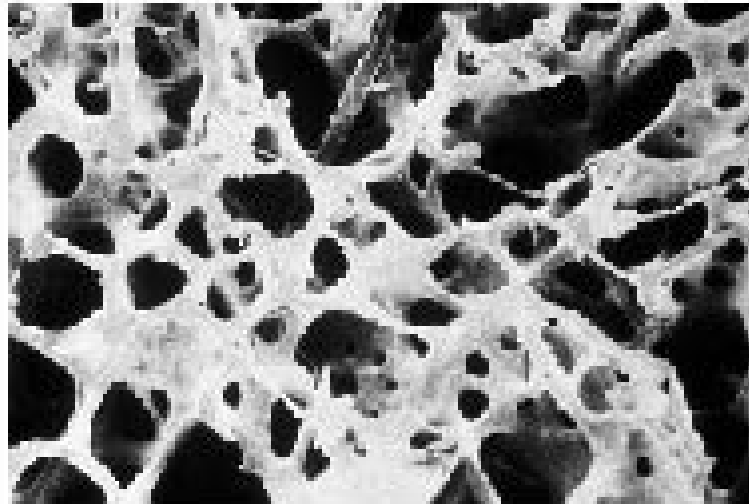




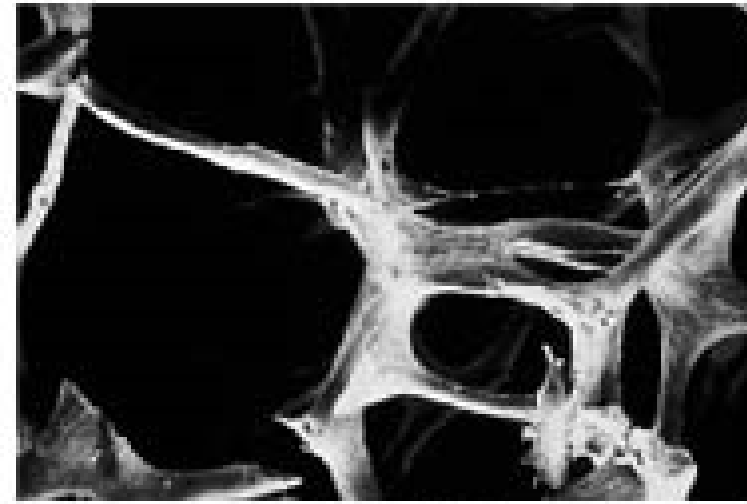
**Jan 2013**



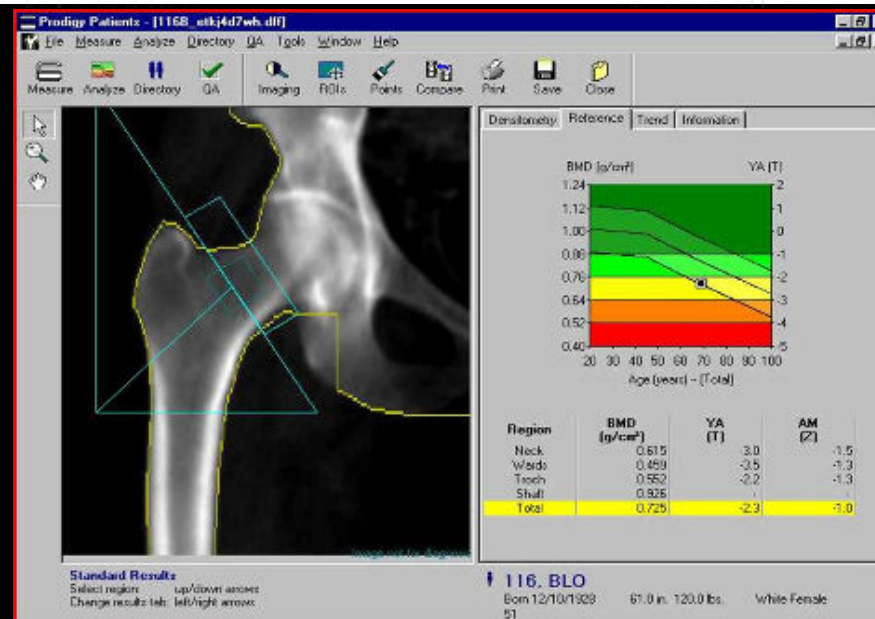
**Aug 2013**



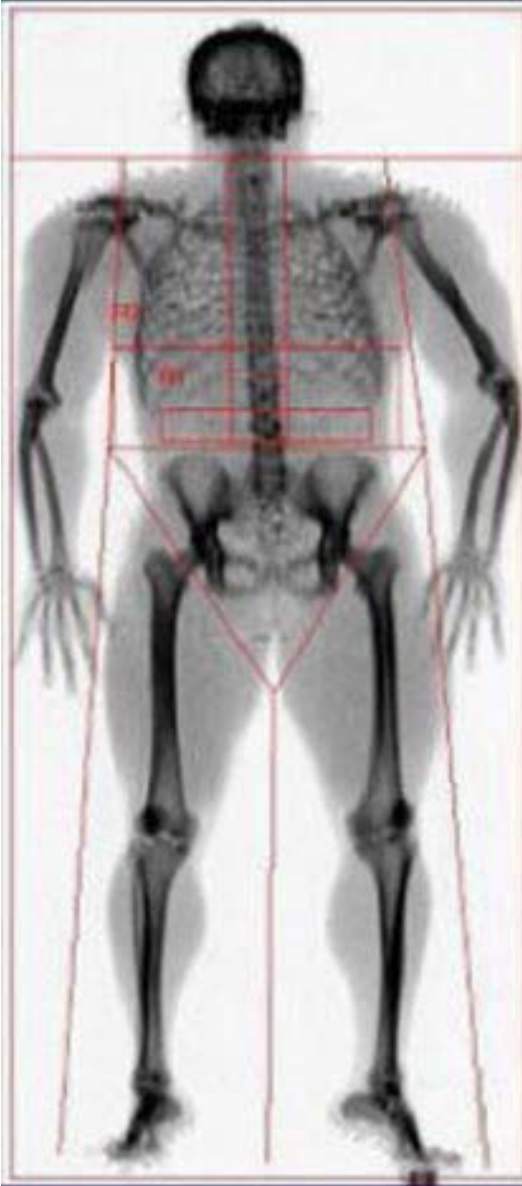
**Normal Bone**



**Osteoporotic Bone**

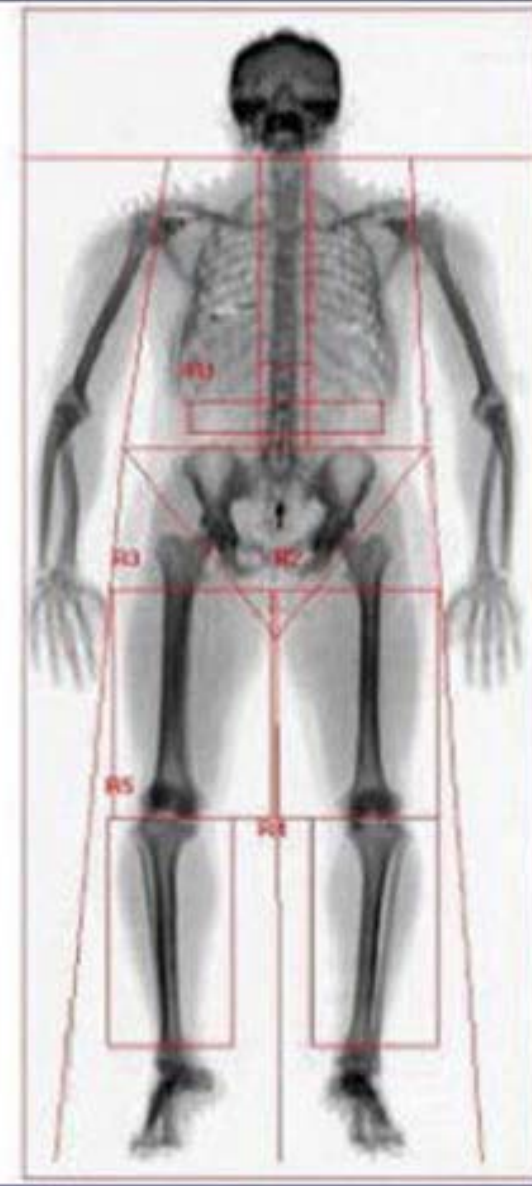


**BMI = 31.7**



DEXA scans  
of two  
individuals  
with the  
same BMI.

**BMI = 31.7**





# ULTRASSOM

**Booth RA, Br J Nutr. 1966; 20(4):719-25.**

Voluson  
E8

11.08.1984

RAB4-8-D/OB

MI 1.1

Dr. Moroder ecofetale.com

GA=12w3d

8.3cm/1.4/16Hz

TIs 0.1

02.02.2012

12:41:36

Routine

Har-high

97

Gn 10

C6 / M7

P5 / E3

SRI II 5

Voluson  
E8

CRL

CRL 6.51cm  
GA 12w6d 71.8%



**Figura 4.** Trombose crônica da veia porta. Presença de hiperecogenicidade periportal (fibrose) e trombo hiperecogênico residual no interior da veia porta.



# TOMOGRAFIA



## RESSONÂNCIA MAGNÉTICA





## Bioimpedância ou Impedância Bioelétrica



FOTO ILUSTRATIVA MOSTRANDO COMO DEVE SER A COLOCAÇÃO DOS ELETRODOS, SENDO DOIS NO PUNHO E DOIS NO TORNOZELO





# Hidrodensitometria

Densidade da gordura = 0,9 g/mL

Densidade da massa livre de gordura = 1,1 g/mL

# Pletismografia gasosa

Água Marcada – Deutério e Trítio (Trício –  $H^3$ )

# Antropometria

# Respirometria

# Q-NRG+

Introducing the new generation of Metabolic Monitors for Indirect Calorimetry in Clinical and Critical Care Practice





Weight



Body Volume



Fat & Fat-Free Mass



Lung Volumes

Clin Nutr. 2020 Jan 31:S0261-5614(20)30040-6





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Original article

## The clinical evaluation of the new indirect calorimeter developed by the ICALIC project

Taku Oshima<sup>a</sup>, Marta Delsoglio<sup>b</sup>, Yves M. Dupertuis<sup>b</sup>, Pierre Singer<sup>c</sup>,  
Elisabeth De Waele<sup>d,e,f</sup>, Cecilia Veraar<sup>g</sup>, Claudia-Paula Heidegger<sup>h</sup>, Jan Wernermann<sup>i</sup>,  
Paul E. Wischmeyer<sup>j</sup>, Mette M. Berger<sup>k</sup>, Claude Pichard<sup>b,\*</sup>

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<sup>b</sup> Nutrition Unit, Geneva University Hospital, Rue Gabrielle-Perret-Gentil 4, 1211, Geneva, Switzerland

<sup>c</sup> Critical Care Medicine, Institute for Nutrition Research, Rabin Medical Center, Beilison Hospital, Petah Tikva, 49100, Israel

<sup>d</sup> Department of Intensive Care, Vrije Universiteit Brussel, Brussels, Belgium

<sup>e</sup> Department of Intensive Care, Universitair Ziekenhuis Brussel, Vrije Universiteit Brussel, Brussels, Belgium

<sup>f</sup> Department of Nutrition, Universitair Ziekenhuis Brussel, Vrije Universiteit Brussel, Brussels, Belgium

<sup>g</sup> Division of Cardiac Thoracic Vascular Anesthesia and Intensive Care Medicine, University Hospital of Vienna, Waehringer Guertel 18-20, 1090 Vienna, Austria

<sup>h</sup> Department of Acute Medicine, Division of Intensive Care, Geneva University Hospital, Rue Gabrielle-Perret-Gentil 4, 1211 Geneva, Switzerland

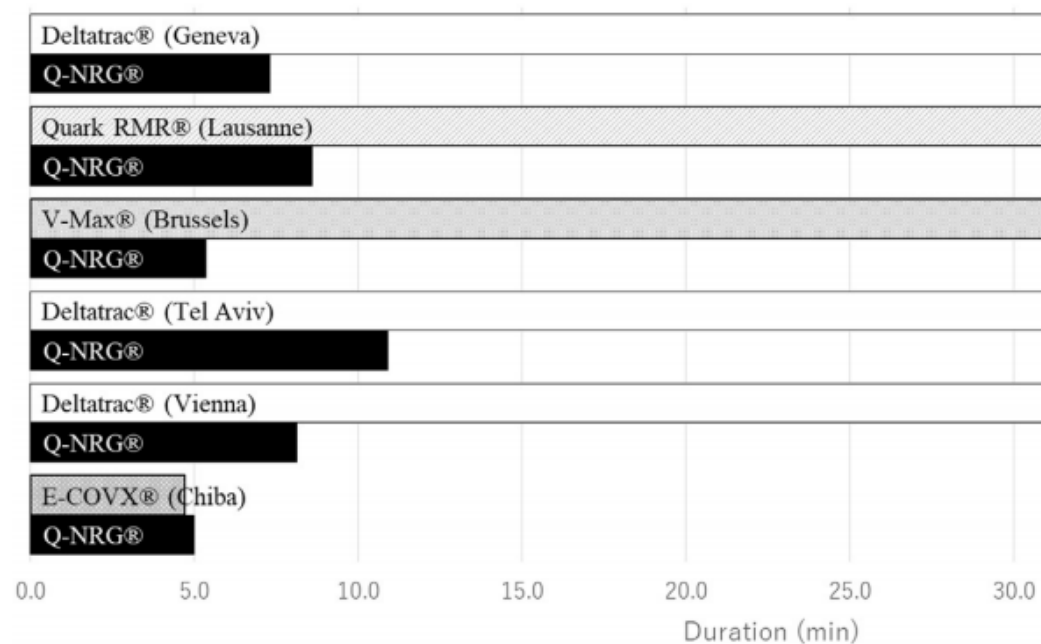
<sup>i</sup> Department of Anesthesiology and Intensive Care Medicine, Karolinska University Hospital Huddinge, Sweden

<sup>j</sup> Department of Anesthesiology, Duke University, Durham, NC, USA

<sup>k</sup> Service of Adult Intensive Care, Lausanne University Hospital, 1011 Lausanne, Switzerland

Name	Technology**	Spontaneous breath	Mechanical Ventilation	Warm up	Gas Calibration	
Q-NRG® (Cosmed, Italy)	Mixing chamber	Yes	Yes	No	Automatic 1/month	
Deltatrac II® * (Datex, Finland)	Mixing chamber	Yes	Yes	30 min	Manual Each measure	
Quark RMR® (Cosmed, Italy)	Breath by breath	Yes	Yes	30 min	Automatic Each measure	
Vmax Encore® (Vyaire, California)	Breath by breath Mixing chamber	Yes	Yes	30 min	Automatic	
E-COVX® (Datex-Ohmeda, Finland)	Breath by breath	No	Yes	No	No	





**Fig. 2. Primary Outcome: Duration required to obtain clinically relevant EE measurements using the Q-NRG®** duration required to obtain clinically relevant EE measurements against different currently used indirect calorimetry comparators is indicated within the bar graph. \* $p < 0.05$ .

## Conflict of interest

T Oshima received research grant from the public Foundation Nutrition 2000.

M Delsoglio, YM Dupertuis and C Veraar have no conflict of interest.

P Singer received nonrestrictive research grants and/or honoraries for lectures from Abbott, Baxter, B Braun, Fresenius-Kabi, Nestle, Nutricia and ART Medical., GE, Cosmed and Mindray.

E De Waele received unrestricted research grants from the Belgian Government of Health, Baxter Healthcare, Nutricia, Fresenius Kabi International, B Braun and honoraries for lectures for Baxter, Nutricia, and Fresenius Kabi, none being related to the present study.

CP Heidegger received restricted research grants from Fresenius Kabi and Nestlé, none being related to the present study.

J Wernerman: received consulting fees and/or honoraries for lectures for Baxter, Fresenius Kabi, GE Health Care, Nestlé, and Nutricia none being related to the present study.

P Wischmeyer received grant funding from National Institutes of Health, Canadian Institutes of Health Research, Abbott, Baxter, Fresenius and Takeda, unrestricted gift donations in support of nutrition research from Cosmed and Musclesound, honoraria or travel expenses for CME lectures on improving nutrition care from Abbott, Baxter, and Nutricia. He has served as a consultant to Abbott, Fresenius, Baxter, Cardinal Health, Nutricia and Takeda for ICU nutrition research.

MM Berger received unrestricted research grant from Fresenius Kabi International, consulting fees from Fresenius Kabi International, and honoraries for lectures for Fresenius Kabi, Nestlé, and Baxter, none being related to the present study.

C Pichard received financial support from research grants and unrestricted academic research grants from the public institutions, as well as no-restrictive research grants and consulting fees from the Foundation Nutrition 2000plus, Abbott, Baxter, B. Braun, Cosmed, Fresenius-Kabi, Nestle Medical Nutrition, Novartis, Nutricia-Numico, Pfizer, Shire and Solvay.