

Board of examiners

Prof. Dr. Pierre Singer

Department of General Intensive Care
Institute for Nutrition Research
Rabin Medical Center, Beilinson, Tel Aviv

PhD in Medical Sciences
2015-2016

Prof. Dr. Alain Dive

Department of Intensive Care
Mont-Godinne University Hospital
Université Catholique de Louvain, Yvoir

INVITATION to the Public defence of

Elisabeth DE WAELE

To obtain the academic degree of '**DOCTOR IN MEDICAL SCIENCES'**

Energy Expenditure and Nutritional Therapy in Critically ill Patients

Prof. Dr. Jan De Waele

Department of Critical Care Medicine
Universitair Ziekenhuis Gent - Universiteit Gent

Prof. Dr. Ives Hubloue

Department of Emergency Medicine
Universitair Ziekenhuis Brussel - Vrije Universiteit Brussel

Prof. Dr. Christian Simoens

Department of Abdominal Surgery
Universitair Ziekenhuis Brussel - Vrije Universiteit Brussel

Prof. Dr. Hendrik Reynaert

Department of Gastroenterology-Hepatology
Universitair Ziekenhuis Brussel - Vrije Universiteit Brussel

Prof. Dr. Brigitte Velkeniers, Chair

Department of Endocrinology and General Internal Medicine
Universitair Ziekenhuis Brussel - Vrije Universiteit Brussel

Wednesday 2 December 2015

Auditorium **Brouwer**, 17:00

Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussel

Promotoren :

Prof. Dr. Luc Huyghens

Department of Intensive Care Medicine
Universitair Ziekenhuis Brussel - Vrije Universiteit Brussel

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Prof. Dr. Herbert Spapen

Department of Intensive Care Medicine
Universitair Ziekenhuis Brussel - Vrije Universiteit Brussel

Prof. Dr. Patrick Honoré

Department of Intensive Care Medicine
Universitair Ziekenhuis Brussel - Vrije Universiteit Brussel



Vrije Universiteit Brussel

Summary of the dissertation

Providing adequate nutrition has become an extremely important issue in critically ill patients. We found that caloric requirements were met in only one of four mechanically ventilated patients in our intensive care unit (ICU). This nutritional imbalance mainly resulted from incorrect prescription.

To improve prescriptions, we introduced an evidence-based protocol and indirect calorimetry (IC). An extensive feasibility study revealed that IC was indicated in half of the patients and effectively performed in 20%. IC proved to be technically feasible and was not time-consuming.

In current ICU practice, mathematical equations are used to estimate energy requirements. We assessed whether IC measurements agreed with the results of ten distinct predictive equations. Only a weak correlation was found. If used as a nutritional target, calculated energy expenditure would result in significant under- and overfeeding.

To date, mathematical equations are applied for estimating metabolic rate in patients treated with extracorporeal membrane oxygenation (ECMO) and continuous renal replacement therapy (CRRT). Performing IC is complex during ECMO since gas exchange is divided between the mechanical ventilator and the artificial lung. We developed and report preliminary clinical experience with a novel technical set-up to measure gas exchange in both devices. In addition, we propose a theoretical model to derive energy expenditure by incorporating acquired data in an adjusted formula.

We reviewed the literature on nutrition in ICU patients treated with CRRT. Feeding these patients is challenging since both kidney injury and CRRT induce substantial metabolic disturbances. We make clinical recommendations for handling requirements in energy, protein, electrolytes, glucose, amino acids, lipids, vitamins and trace-elements in patients undergoing CRRT. The implementation of the results of these five studies improves the level of care of critically ill patients.

Curriculum Vitae

Elisabeth De Waele was born on the 22nd of April 1978 in Vilvoorde. After graduating from high school in 1996 at the Koninklijk Atheneum Zaventem (Mathematics and Science), she studied at the medical school of the Vrije Universiteit Brussel and obtained her medical degree with great distinction in 2004. She performed a postgraduate training in general surgery and spent the first two years in the Sint-Jozef Ziekenhuis-Maria Middelares in Ghent, the next four years in the surgical Departments of the Universitair Ziekenhuis Brussel, and obtained her degree in Surgery in 2010. She completed two years of residency in the Intensive Care Departement and obtained the degree as critical care physician in 2012. She is currently working at the same Department (Head of Clinics). Her main fields of interest are clinical nutrition and cardiac surgery patients.

Besides, Sabeth De Waele is President of the Nutritionteam of the Universitair Ziekenhuis Brussel. She acted as promotor and copromotor for several doctorandi. She acts as a clinical tutor for medical students, pharmacists in formation and dieticians. She published six articles as a first author and 44 in co-authorship in peer-reviewed journals.

Sabeth De Waele is married to Christophe Blockeel and together they have 3 children: Elisabeth, Boris Alexander and Francis.