

## 1. Description of the initiative

### Background / context

Clinical Nutrition specialty suffers from a lack of precise diagnostic parameters on which could be based the nutritional support. Recent studies have shown that the prediction of energy expenditure (EE) is inaccurate in  $\geq 60\%$  of the patients resulting in inaccurate nutritional support prescriptions, leading to adverse events related to over- or underfeeding.

### Rationale for the initiative

- Current indirect calorimeters (IC) are inaccurate, cumbersome and very costly.
- We have developed a new IC (Q-NRG, COSMED, Italy) easy-to-use (8 minutes to stable reading of EE), highly accurate, portable and affordable (11'000 E), which allow calorimetry based nutritional support.

### Objectives and scope

- To assess the time needed to obtain stable EE measurements using the new Q-NRG calorimeter.
- To compare measured EE by the Q-NRG with predicted EE.
- To promote routine EE measurements in order to individualize energy prescription at baseline and during disease courses.

### Study design and Methods

- Prospective, multicenter study in  $\geq 7$  Swiss hospitals.
- All adult patients are eligible: 53/center, total=371 patients (statistical power analysis available on request).
- Primary outcome : time needed to obtain stable EE measurements using the Q-NRG.
- Secondary outcomes : a/ difference between the IC measured and predicted EE; b/ evolution of EE during disease courses.

## 2. Planned activities & deliverables

### Outline of the steps

- Patient enrolment has already started in Geneva and Lausanne, and will be extended to the other Swiss hospitals.

### What are the concrete deliverables of the project?

- If proven feasible in routine care, measured EE will allow for optimal prescription of nutritional support. This will contribute to establish nutritional support as a standard medical prescription based on precise measurements and monitoring.

### What achievements are possible in the next 12 and 24 months?

- Expected time needed for patient enrolment at each center: 5-6 months. Data collection and analysis: 1-2 months. Preparation of data presentation and publication in a peer-reviewed journal: 2-3 months.

## 3. Resources & enablers

### Describe personnel, financial needs

- Research assistant (6'000E/center). Fees for the Ethical Research Committee (2'000E/center). 30'000E from MNI and 30'000E granted by the Fondation Nutrition 2000plus.

### Specify how the grant will be spent

- Q-NRG will be provided for free by the manufacturer. Each investigation center will receive 8'000E. Geneva coordinating center: additional 4'000E.

### What factors will make it successful?

- All co-investigators have a large experience in clinical nutrition and investigations, and are Committee members of ESPEN and SSNC which supports this project.

## 4. Results/outcomes & expected impact

### How will the findings be implemented?

This project will prove that EE measurement is achievable in  $< 10\text{min}$  with the new Q-NRG calorimeter.

### How will this project advance patient care / contribute to optimal nutritional care?

The results will encourage clinicians to routinely measure EE by indirect calorimetry, to individualize energy prescription and thus prevent negative outcome related to over- or underfeeding.

### What makes the project innovative?

Q-NRG is the first IC developed with a bottom-up strategy, and no equivalent IC is commercially available.

### Will the project be likely to influence national nutrition policy?

YES, because it will optimize nutritional cares and new guidelines could be released.

### Is the project transferable to other settings / countries?

YES, because Q-NRG price is affordable which should allow for its dissemination in other countries. Education for routine use of calorimetry will be disseminated through ESPEN LLL courses.