

## Letter to the editor JPEN

### Structural underfeeding due to inaccurate feeding pumps?

Peter E. Spronk<sup>1,3</sup>, Johannes H. Rommes<sup>1</sup>, and Michael A. Kuiper<sup>2,3</sup>

Departments of Intensive Care Medicine, Gelre Hospital (location Lukas)<sup>1</sup>, Apeldoorn, and Medical Center Leeuwarden<sup>2</sup>, and HERMES critical care group<sup>3</sup>, Amsterdam, the Netherlands

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Address correspondence to  
Peter E. Spronk, MD PhD FCCP  
Department of Intensive Care Medicine  
Gelre Ziekenhuizen, locatie Lukas  
Albert Schweitzerlaan 31  
7334 DZ Apeldoorn  
the Netherlands  
voice: +31 55 5818450  
fax: +31 55 5818456  
e-mail: [p.spronk@gelre.nl](mailto:p.spronk@gelre.nl)

Sir – in your Journal, Tepaske *et al.* reported that important differences exist between prescribed and delivered volumes of enteral nutrition in intensive care [1]. This is an intriguing finding, since preset goals for optimal nutrition may not be reached due to pump problems. Most critically patients should be ready for enteral nutrition within 24 to 48 hours of intensive care unit admission [2]. Also, most patients should reach preset targets for calculated nutritional requirements by the development and use of an evidence-based nutritional support protocol [3]. Nevertheless, we would like to discuss the following issue.

As the authors correctly point out, an important weakness in their study is the fact that they only analysed one feeding pump of each type. They made the assumption that the tested pump would be representative of all pumps of the same type. We would like to show data that this assumption is probably not true.

We evaluated the Kangaroo 324 (N=6) and the Kangaroo 224 (N=8) feeding pumps and used both stomach and duodenal feeding tubes separately. All pumps were set to deliver 100 ml/hour and actual delivered volume was determined after 60 minutes. These measurements were repeated thrice with consequently stopping and reactivating the pumps. Both sterile water and a standard enteral feeding formula (Standard Nutrison, Nutricia, Netherlands) were analysed separately. As shown in the table, results from both pumps were comparable with a structural lower actual delivery than the preset volume, which confirms the data from Tepaske *et al.* More importantly, however, some pumps demonstrated large discrepancies up to 24 ml/hour below the preset volume. This was predominantly observed with the Kangaroo-224 type and occurred despite frequent calibration by the technical service using volume/weight analysis.

In view of these observations, we would like to strengthen the message by Tepaske *et al.* and stress the importance of frequent calibrations of all feeding pumps in the critically ill. The approach suggested by Tepaske *et al.* in that we should choose “the best performing enteral nutrition feeding pump” is probably not sufficient to guarantee present targets for calculated nutritional requirements in all patients.

Table 1

<b>Kangaroo 324</b>	Stomach tube		Duodenal tube	
(N=6)	Water (ml)	Nutrison (ml)	Water (ml)	Nutrison (ml)
median	87	93	93	93
Mean	88	92	94	93
Min	80	88	90	87
Max	98	95	102	98
 <b>Kangaroo 224</b>				
(N=8)				
Median	96	91	93	94
Mean	93	90	91	93
Min	76	80	77	75
Max	107	97	98	100

## References

1. Tepaske R, Binnekade JM, Goedhart PT et al. Clinically relevant differences in accuracy of enteral nutrition feeding pump systems. *JPEN J Parenter Enteral Nutr.* 2006;30:339-343.
2. Spain DA. When is the seriously ill patient ready to be fed? *JPEN J Parenter Enteral Nutr.* 2002;26:S62-S65.
3. Mackenzie SL, Zygun DA, Whitmore BL et al. Implementation of a nutrition support protocol increases the proportion of mechanically ventilated patients reaching enteral nutrition targets in the adult intensive care unit. *JPEN J Parenter Enteral Nutr.* 2005;29:74-80.