

## Adequacy of energy provision in patients admitted to critical care

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It is frequently reported that critically-ill patients receive inadequate nutrition due to delays in initiating and interruptions to nutrition support, and enteral feeding protocols may minimize these<sup>(1,2)</sup>. The current critical care protocol used advises that feeding should be considered within 24 h of admission and aims for a target rate of 80 ml/h, providing 8033 kJ/d. The aim was to establish when enteral nutrition is started, target rate achieved and to assess adequacy of energy provision. Data were collected over a 4-week period for adult patients admitted for level 3 critical care where enteral nutrition was started via a nasogastric (NG) tube and the patient anticipated to stay for more than 48 h. Data were collected from admission until the patient resumed oral intake, transferred to ward, died or at day 10.

Twenty patients met the inclusion criteria and 157 patient days were reviewed. There were twelve women and eight men, average age 53.2 (range 23–76) years. The average patient weight was 71 (range 45–110) kg and BMI 26.8 (range 15.6–47.6) kg/m<sup>2</sup>. Patients were fed for 144 d (92%). A total of 80% of patients started feeding within 24 h of admission, average 14.45 (range 1–52) h and 85% of patients subsequently achieved target rate within 48 h, average 21.7 (range 4–68) h. The average duration from admission to optimum rate was 36.7 (range 1–112) h. There were thirty-nine documented interruptions to NG feeding, average 1.95 (range 0–6) per patient. Reasons for interruptions were planned airway procedures (nineteen) and investigations (eight) and unplanned NG tube related (ten) and vomiting (two). Large gastric aspirates limited feeding for a further seven patient days and five patients received prokinetics.

Day	0	1	2	3	4	5	6	7	8	9	10
Patients fed	11	17	19	18	16	15	13	11	10	8	7
Interruption	0	1	4	7	5	5	4	3	4	4	2
Average (kJ/d)	2238	5088	5351	5820	6159	6832	6632	6640	6468	6565	6527
Min (kJ/d)	225	1506	1105	2008	1356	1146	4540	3079	2385	4264	3544
Max (kJ/d)	5130	7908	7983	7686	8167	7908	8012	7807	8033	7686	8033
Average (kJ/kg)	34.3	73.6	78.2	87.9	85.8	94.6	95.4	98.3	98.3	103	96.2
Min (kJ/kg)	29.3	25.1	18.4	30.1	22.6	25.7	50.2	33.5	26.4	61.1	50.6
Max (kJ/kg)	110	123	115	162	129	176	171	157	176	171	172

Overall, an average of 65% target energy intake was achieved on days 1–3, increasing to 75% at day 4, 85% at day 5 and 80–82% between days 6–10. Patients fed at target protocol rate without interruption received an average 7682 kJ/d (95.6%) potential energy intake (range 7084–8167 kJ/d) or 108 (range 77.0–171) kJ/kg.

Despite small numbers, the present review suggests that enteral feeding via NG tube is well tolerated and can be commenced as soon as practically possible after admission to critical care. The average energy provision of 83.7 kJ/kg from day 3 is higher than reported in the literature and supports the use of a feeding protocol. Interruptions to feeding can be frequent and affect energy provision. Once target protocol rate has been achieved, feeding rates should be adjusted to compensate for planned and unplanned interruptions to feeding to ensure nutrition intake is not compromised.

1. Kreyman KG, Berger MM, Deutz NEP *et al.* (2006) *Clin Nutr* **25**, 210–223.
2. Heyland DK, Dhaliwal R, Drover JW *et al.* (2003) *J Parenter Enteral Nutr* **27**, 355–373.