

## **A prospective survey of nutritional support practices in intensive care unit patients: What is prescribed? What is delivered?**

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### **Abstract**

**Objectives:** To assess the amount of nutrients delivered, prescribed, and required for critically ill patients and to identify the reasons for discrepancies between prescriptions and requirements and between prescriptions and actual delivery of nutrition.

**Design:** Prospective cohort study.

**Setting:** Twelve-bed medical intensive care unit in a university-affiliated general hospital.

**Patients:** Fifty-one consecutive patients, receiving nutritional support either enterally or intravenously for  $\geq 2$  days. We followed patients for the first 14 days of nutritional delivery.

**Measurements and Main Results :** The amount of calories prescribed and the amount actually delivered were recorded daily and compared with the theoretical energy requirements. A combined regimen of enteral and parenteral nutrition was administered on 58% of the 484 nutrition days analyzed, and 63.5% of total caloric intake was delivered enterally. Seventy-eight percent of the mean caloric amount required was prescribed, and 71% was effectively delivered. The amount of calories actually delivered compared with the amount prescribed was significantly lower in enteral than in parenteral administration (86.8% vs. 112.4%,  $p < .001$ ). Discrepancies between prescription and delivery of enterally administered nutrients were attributable to interruptions caused by digestive intolerance (27.7%, mean daily wasted volume 641 mL), airway management (30.8%, wasted volume 745 mL), and diagnostic procedures (26.6%, wasted volume 567 mL). Factors significantly associated with a low prescription rate of nutritional support were the administration of vasoactive drugs, central venous catheterization, and the need for extrarenal replacement.

**Conclusions:** An inadequate delivery of enteral nutrition and a low rate of nutrition prescription resulted in low caloric intake in our intensive care unit patients. A large volume of enterally administered nutrients was wasted because of inadequate timing in stopping and restarting enteral feeding. The inverse correlation between the prescription rate of nutrition and the intensity of care required suggests that physicians need to pay more attention to providing appropriate nutritional support for the most severely ill patients.

## **Enteral tube feeding in the intensive care unit: Factors impeding adequate delivery**

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### **Abstract**

**Objective:** To evaluate those factors that impact on the delivery of enteral tube feeding.

**Design:** Prospective study.

**Setting:** Medical intensive care units (ICU) and coronary care units at two university-based hospitals.

**Patients:** Forty-four medical ICU/coronary care unit patients (mean age, 57.8 yrs; 70% male) who were to receive nothing by mouth and were placed on enteral tube feeding.

**Interventions:** Rate of enteral tube feeding ordered, actual volume delivered, patient position, residual volume, flush volume, presence of blue food coloring in oropharynx, and stool frequency were recorded every 4 hrs. Duration and reason for cessation of enteral tube feeding were documented.

**Measurements and Main Results:** Physicians ordered a daily mean volume of enteral tube feeding that was 65.6% of goal requirements, but an average of only 78.1% of the volume ordered was actually infused. Thus, patients received a mean volume of enteral tube feeding for all 339 days of infusion that was 51.6% of goal (range, 15.1% to 87.1%). Only 14% of patients reached  $\geq 90\%$  of goal feeding (for a single day) within 72 hrs of the start of enteral tube feeding infusion. Of 24 patients weighed before and after, 54% were noted to lose weight on enteral tube feeding. Declining albumin levels through the enteral tube feeding period correlated significantly with decreasing percent of goal calories infused ( $p = .042$ ;  $r^2 = .13$ ). Diarrhea occurred in 23 patients (52.3%) for a mean 38.2% of enteral tube feeding days. In  $>1490$  bedside evaluations, patients were observed to be in the supine position only 0.45%, residual volume of  $>200$  mL was found 2.8%, and blue food coloring was found in the oropharynx 5.1% of the time. Despite this, cessation of enteral tube feeding occurred in 83.7% of patients for a mean 19.6% of the potential infusion time. Sixty-six percent of the enteral tube feeding cessations was judged to be attributable to avoidable causes.

**Conclusions:** The current manner in which enteral tube feeding is delivered in the ICU results in grossly inadequate nutritional support. Barely one half of patient

caloric requirements are met because of underordering by physicians and reduced delivery through frequent and often inappropriate cessation of feedings. (Crit Care Med 1999; 27:1252-1256)

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