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# PROTEIN INTAKE OF MORE THAN 1.2 G/KG AT DAY 4 OF HOSPITAL ADMISSION IS ASSOCIATED WITH SHORTER HOSPITAL STAY IN MALNOURISHED PATIENTS

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## Background

In the Netherlands, the National Performance Indicator for the treatment of malnourished patients is meeting the protein target of more than 1.2g/kg body weight at day 4 of hospital admission. We explored the association between meeting the protein target and length of hospital stay (LOS) in malnourished hospital patients.

## Design

Retrospective analyses of adult malnourished hospital patients were conducted. Patients were referred for dietetic treatment and evaluation was based on day 4 protein intake. Energy target was the estimated resting energy expenditure (Harris and Benedict equation) + 30%.

## Participants

1047 patients from 2 hospitals, a general (n=607) and an academic hospital (n=440), were classified as malnourished on admission (SNAQ score ≥3). Of these patients, 51% were male, mean age was 66±15 years, and mean BMI 23±5 kg/m$^2$. Mean protein intake on day 4 was 0.95±0.50 g/kg, and mean energy intake was 1523±705 kcal.

## Outcome measures

LOS was determined between date of hospital admission and discharge. Regression analysis was performed with log-transformed LOS as the dependent variable and protein intake >1.2 g/kg as the independent variable, adjusted for energy intake (% of target) and hospital.

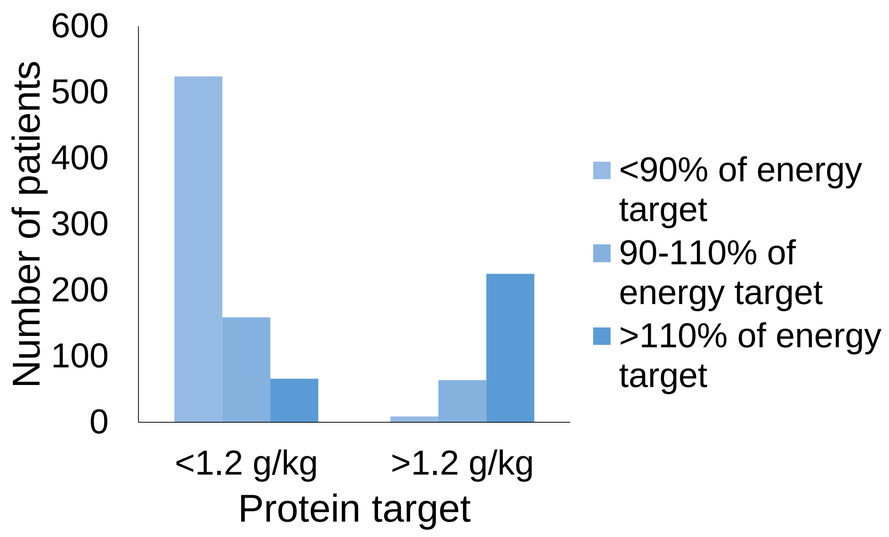


**Figure** Number of patients meeting their protein target

## Results

Below 90% of the energy target (n=533), the protein target was hardly met (n=9). Only 223 and 291 patients met 90-110% and >110% of their energy target, respectively. A protein intake of >1.2 g/kg was met in 64 (29%) and 225 (77%) of these patients (Figure).

Except for BMI and energy intake, patient characteristics were comparable between those who did met and those who did not met the protein target (Table 1). Median LOS was 10 days for both groups.

**Table 1** Patient characteristics by protein target

| Characteristic | <1.2 g/kg | >1.2 g/kg |
|---|---|---|
| N | 749 | 298 |
| Gender, n males (%) | 387 (52) | 148 (50) |
| Age, years | 65±16 | 67±14 |
| BMI, kg/m$^2$ | 24±5 | 21±4* |
| Energy intake, %target | 70±33 | 128±25* |
| Hospital, n academic (%) | 313 (42) | 127 (43) |

* P-value for difference <0.05

In multivariable analyses, meeting the protein target was significantly associated with a 19% shorter length of hospital stay within 90-110% of the energy target, with no significant benefit at >110% of the energy target (Table 2).

**Table 2** Association between protein target and log-transformed LOS by energy target

| Energy intake | Crude β (95% CI) | Adjusted* β (95% CI) | Change in LOS** |
|---|---|---|---|
| 90-110% of target | -0.10 (-0.26;0.07) | -0.22 (-0.38;-0.05) | -19% |
| >110% of target | -0.04 (-0.21;0.13) | -0.05 (-0.23;0.14) | -5% |

* Adjusted for energy intake (%target) and hospital; ** the corresponding change in LOS was calculated using the adjusted β estimates

## Conclusion

Only 1 in 3 patients met the protein target of 1.2 g/kg body weight at day 4 of hospital admission. In adequately fed patients (>1.2 g protein /kg body weight and 90-110% of the energy target) length of hospital stay was 19% shorter.

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