

Most hospitalized patients at nutritional risk do not meet their requirements – despite known effectiveness of nutrition support

Nutritional care and treatment of hospitalized patients: A multicenter cross-sectional study

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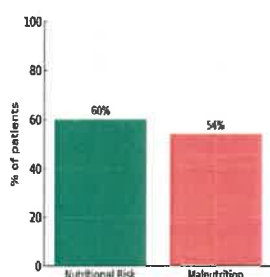
PT58

Background

Malnutrition is common in hospitalized patients and affects clinical outcomes¹. We assessed the prevalence of nutritional risk and malnutrition and evaluated whether hospitalized at-risk patients had documented nutritional intake and had an adequate nutritional intake.

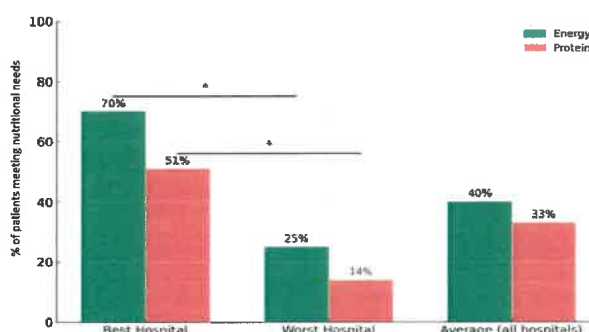
Results

Figure 1. Prevalence of nutritional risk and malnutrition



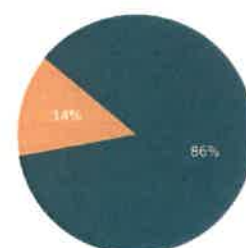
60% of patients were at nutritional risk (based on NRS-2002), and 54% were diagnosed with malnutrition (according to GLIM criteria) (n=571).

Figure 2. Nutritional intake



Proportion of patients meeting individual energy and protein requirements in the best-performing, worst-performing, and average-performing hospitals. A significant difference was found ($p<0.001$)*

Figure 3. Supplementation of enteral and parenteral nutrition



Only 14% of patients received enteral or parenteral nutrition, and all who did, met their energy and protein requirement. 86% did not receive such support, highlighting risk of underuse.

Method

A cross-sectional study was conducted in September 2023 across six public hospitals in Denmark. The setting is a tax-funded healthcare system providing free diagnosis and treatment to all citizens within a hospital catchment area of 1.9 million. Hospitalized patients ≥ 18 years with ≥ 4 days of admission were included; ICU, palliative, acute, and maternity wards were excluded. Data were collected via electronic medical record reviews and staff interviews.

Tools used:

- NRS-2002 for nutrition risk
- GLIM criteria for malnutrition
- 24h recall interview for intake
- Calf circumference to assess muscle mass
- p-CRP for assess stress metabolism

Summary/ Highlights

Despite documentation of nutritional risk, most patients at risk did not meet nutritional requirement. Hospitals vary widely in performance, highlighting lack of systematic management. Enteral or parenteral nutrition was effective, but underused.

→ A structured and proactive approach to hospital nutrition is urgently needed.



References:

- 1) Schuetz P, Fehr R, Baechli V, Geiser M, Deiss M, Gomas F, et al. Individualised nutritional support in medical inpatients at nutritional risk: a randomised clinical trial. *Lancet* 2019;393:2312–21. [https://doi.org/10.1016/S0140-6736\(18\)32776-4](https://doi.org/10.1016/S0140-6736(18)32776-4)

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A need for more comprehensive nutritional support for patients with head and neck cancer during treatment

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Nutritional treatment in patients with head and neck cancer - a retrospective study

P009

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Background

Patients with head and neck cancer (HNC) face a high risk of disease-related malnutrition, which, left untreated, negatively affects outcomes [1]. This study aimed to assess nutritional status throughout the patients' treatment period.

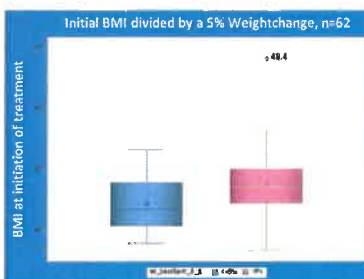
Results

We included 70 patients (60% men). Age 70 (65-77) years, BMI 26 (21-30) kg/m², 36 (53%) had a BMI >25. The treatment period was 112 (106-119) days, and 32 (46%) patients were hospitalized during this period. Follow-up counseling by a clinical dietitian was found in 7 (22%) during a hospitalization, and in 4 (6%) at the outpatient clinic.

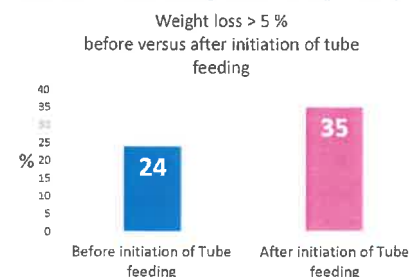
During the treatment period, weight loss >5% was found in 34 (55%) of the patients. Significantly more patients with a weight loss of >5% had a BMI of >25 ($p=0.026$).

Tube-feeding was initiated in 29 (41%), after a treatment period of 69 (60-80) days. Comparing patients in tube-feeding versus only orally fed, a weight-loss of >5% was found in 65% versus 47% ($p=0.156$).

Those who had a weight loss > 5% had a significantly higher BMI at treatment initiation (23.6 vs. 27.2, $p=0.016$).



Before initiation of tube-feeding 24% had a weight-loss >5%, and after initiation of tube-feeding 35% had a weight-loss >5% ($p=0.674$).



Method

A retrospective study including patients with HNC and referred to a clinical dietitian within a one-year period (October 2023 to October 2024).

The patients followed the hospital's standard procedure with one dietetic counseling session, aimed at two weeks after the start of treatment at the outpatient clinic. Follow-up counseling by a dietitian was only conducted at referral by the medical doctor.

Data are presented as median (IQR) and n (%). Differences between groups are analyzed by a χ^2 -test.

Data collected from the medical journal:

- Sex
- BMI
- Weights during the treatment period
- Duration of treatment period
- Hospitalization during the treatment period
- Follow-up counseling by a clinical dietitian
- Tube feeding

Summary/ Highlights

- > More than half of the patients had a weight loss of > 5%
 - > A weight loss of > 5% was more prevalent in patients with a BMI of > 25 kg/m²
- These findings indicate a need for more comprehensive nutritional support



References

- [1] Bergatz L, Brack C, Herrmann J, Bergatz L, Hersberger L, Bergatz M, et al. Nutritional support during the hospital stay reduces mortality in patients with different types of cancers: secondary analysis of a prospective randomized trial. *Ann Oncol* 2021;32:1025-33. <https://doi.org/10.1016/j.annonc.2021.05.793>.

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Mind the Gap: Standard Equations Miss the Mark as Only a Third Match Indirect Calorimetry and Energy Intake Falls Short of Measured Requirements



Energy requirements and intake in patients admitted to the gastro-surgical department

P105

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Background

Proper nutrition is essential for hospitalized patients to ensure effective treatment outcomes [1].

Therefore, the study aimed to:

- 1) Measure the energy requirements of hospitalized patients and compare them with predicted requirements
- 2) Compare energy requirements and intake.



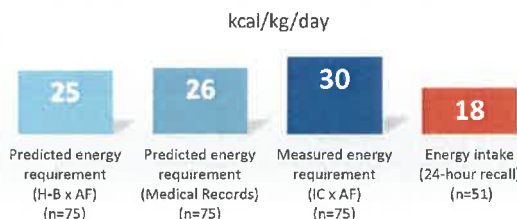
Results

Table 1. Patient characteristics	Included n=75
Sex, women, n (%)	45 (60)
Age, years, median (IQR)	74 (66-81)
BMI, kg/m ² , median (IQR)	24.4 (21.2-28.8)
Nutritional risk, NRS-2002, n (%)	55 (73)
Activity level (AF), median (IQR)	1.3 (1.3-1.3)

Agreement between IC and equations

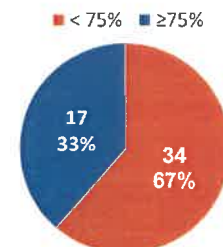
Compared to the IC measurements, 28% were estimated correctly using the Harris-Benedict equation, and 36% were estimated correctly using the equation from the Medical Records.

Total Energy requirements and intake, median kcal/kg/day.



Energy intake was significantly lower than the measured total energy requirement (IC x AF) (n=51, p<0.0001).

Number of patients achieving ≥75% of energy requirement (IC x AF), (n=51).



Method

A cross-sectional study including patients from the Department of Gastroenterology, Surgical ward, Copenhagen University Hospital, Herlev.

From the medical record data were collected on:

- Sex
- Age
- BMI
- Nutritional risk (NRS-2002)
- Total Energy Expenditure (TEE)
- Activity level (AF) (1.1=bed rest; 1.2=chair; 1.3=walk)

The patients' resting energy expenditure (REE) was measured by indirect calorimetry (IC).



(A.S. Jørgensen, Private Photo)

Predictive equations (TEE = Total Energy Expenditure)

To achieve TEE, REE was multiplied by an Activity Factor (AF: 1.1-1.3)

Medical Records (TEE)

27 kcal/kg/day (BMI ≤ 30)

27 kcal/ABW/d (BMI > 30), ABW = (height-100) + weight - (height-100)/3

Harris-Benedict equation x AF (TEE)

Men: BMR = 66.5 + (13.75 x Weight) + (5 x Height) - (6.75 x Age) x AF

Women: BMR = 655.1 + (9.6 x Weight) + (1.850 x Height) - (4.7 x Age) x AF

Agreement between the equations and IC was defined as ± 10%

The patients' energy intake was assessed by a 24-hour recall.



Summary/ Highlights

- An agreement between energy requirements measured by IC and predictive equations was found in less than half of the patients.
- Two-thirds of the patients consumed less energy than their energy requirement. These results call for optimization of nutritional treatment.



References

- [1] Schuetz P, Fehr R, Baechl V, Geiser M, Deiss M, Gomes F, et al. Individualised nutritional support in medical inpatients at nutritional risk: a randomised clinical trial. *Lancet* 2019;393:2312-21. [https://doi.org/10.1016/S0140-6736\(18\)32776-4](https://doi.org/10.1016/S0140-6736(18)32776-4).

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Accurate Energy Assessment in Cirrhosis Requires Indirect Calorimetry – Formulas Often Fail



Predicted estimates versus measured resting energy requirement in patients with liver cirrhosis

P106

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Background

In patients with liver cirrhosis total energy requirement is recommended to be higher than in patients with other diseases. Previous studies have found limited agreement between measured and estimated energy expenditure, and limited knowledge of associations with patient characteristics exists [1]. Therefore, the objective was to examine the agreement between measured-total energy expenditure (TEE) and predicted-TEE testing a variety of formulas. Further, to determine if the degree of agreement was associated with specific characteristics.

Results

A total of 37 patients were included in the study. Measurements with indirect calorimetry (IC) adjusted by AF were a mean of 27.8 ± 45.4 kcal/kg.

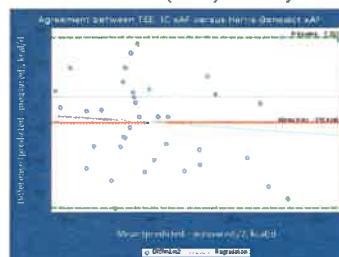
Expressed as $\pm 10\%$, HB and 27 kcal/kg had the highest agreement with measured-TEE equal to 40.5%.

A significant negative correlation was found between the degree of agreement with HB, 30 and 35 kcal/kg ABW, and heart rate ($p < 0.05$).

A negative correlation between temperature and degree of agreement with all tested variables was furthermore found ($p < 0.05$). Lastly, a negative correlation was found with Child Pugh points when calculated by 30 kcal/kg ABW ($p < 0.05$).

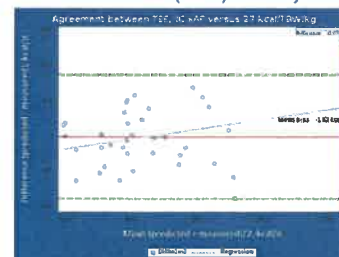
Agreement between TEE, IC x AF versus Harris-Benedict x AF.

Harris Benedict underestimates with a mean bias of $-196 (\pm 333)$ kcal/day.



Agreement between TEE, IC x AF versus 27 kcal/TBW/kg.

27 kcal/TBW/kg underestimates with a mean bias of $-1.62 (\pm 447)$ kcal/day.



Method

The following data were collected;

- Anthropometry
- Vital values
- Blood samples
- Child Pugh points
- Activity Factor (AF)

Predicted-TEE was calculated by,

- Harris-Benedict (HB x AF)
- 27, 30, and 35 kcal/kg actual weight
- 27, 30, and 35 kcal/kg adjusted body weight (ABW).

REE was measured by indirect calorimetry (IC) and converted to measured-TEE by an activity factor (AF) range 1.1 – 1.3.



Summary/ Highlights

In patients with cirrhosis, the majority had their energy requirement either overestimated or underestimated, depending on the predicted-TEE used.

Negative correlations with the degree of agreement were found with heart rate, body temperature, and Child Pugh points..



References

- [1] Limon-Miro AT, Jackson CD, Estamparast T, Yamanaka-Okumura H, Plank LD, Henry CJ, et al. Predicted estimates of resting energy expenditure have limited clinical utility in patients with cirrhosis. J Hepatol 2022;77:98–107. <https://doi.org/10.1016/j.jhep.2022.01.005>.

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Identifying at-risk patients in the emergency department is feasible and may improve outcomes

Nutritional risk and dehydration in older adults in the emergency department: a feasibility study on detection, treatment, and follow-up

P701

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Background

The prevalence of dehydration and malnutrition among older adults in the emergency department (ED) is high. No studies have examined the effects of nutritional interventions initiated in this setting¹. The primary aim of this study was to conduct a feasibility study on detection, treatment, and follow-up of older adults at risk. The secondary aim was to gain an indication of whether the intervention had an effect.

Method

Dehydration was defined as p-osmolality >295 mmol/L and malnutrition was defined as nutritional risk score of minimum 3 according to NRS 2002.

The study was feasibility study in collaboration with four municipalities. Figure 1 illustrates the patient flow. Nutritional treatment was initiated in the ED and followed up in the municipalities at day 4 and day 30 after discharge. Intake of energy, protein, and fluids was recorded using a standardized food and drinks diary (Figure 2).

Data were collected on:

- Eligibility
- Intake of energy, protein, and fluids at day 4 and day 30
- Quality of life (EuroQol EQ-5D-VAS)



Figure 1

Figure 2

Results

Eligibility among screened patients in the ED

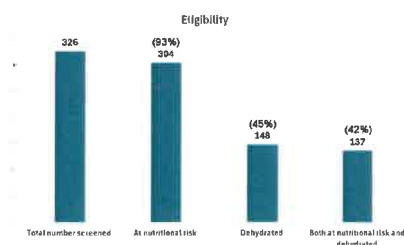


Figure 3

Adequacy of energy, protein, and fluid

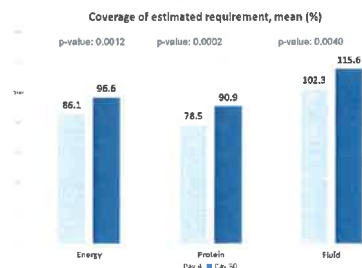


Figure 4

Quality of life (EuroQol EQ-5D-VAS)

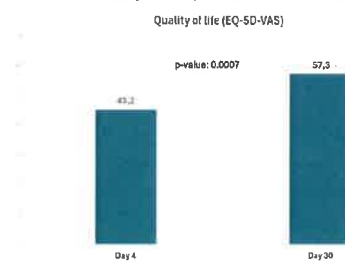


Figure 5

Summary

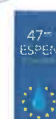
Early detection, treatment, and follow-up of dehydration and nutritional risk in older adults in the ED, along with systematic nutritional follow-up in the municipalities, were feasible. The intervention was associated with improved intake of energy, protein, and fluids, as well as an improvement in quality of life. Additional information is available in reference 2.

References

- 1 Sarier C et al. What is the level of nutrition care provided to older adults attending emergency departments? A scoping review. *BMC Geriatr* 2024 Nov 7;24(1):921
- 2 Nielsen MK et al. Addressing nutritional risk and dehydration in vulnerable older adults in the emergency department: a single-arm feasibility study on detection, treatment, and follow-up. *Clin Nutr ESPEN* 2025 Jul 30;69:468-476.

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Targeted, dietitian-supported interventions significantly improved nutritional screening and intake in older patients with hip fractures.

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The beneficial effects of a multidisciplinary nutritional intervention on nutritional care in older patients with hip fracture and at nutrition risk

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P1072

Background

A cohort study in year 2023 showed that only 22% of older hip fracture patients at nutritional risk met their energy and protein requirements. The current study aimed to improve nutritional care using a structured multidisciplinary approach supported by a clinical dietitian.

Results

The primary outcome was achieved, with 80% of patients meeting both energy and protein requirements, a significant improvement from 22% at baseline ($p<0.05$). Documentation of nutritional risk increased from 10% to 80% ($p<0.01$), and intake documentation improved from 30% to 100% ($p<0.01$).

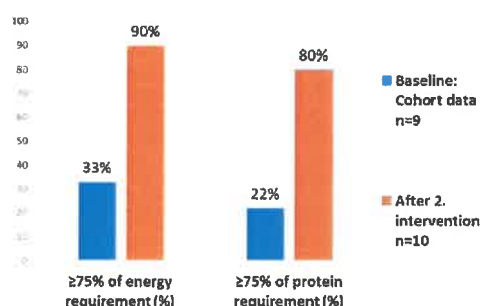


Figure 2. Effect on Nutritional Intake

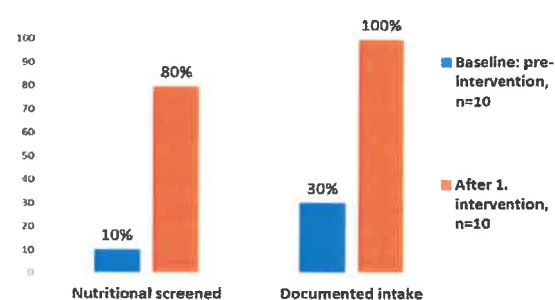


Figure 3. Effect on nutritional screening and documentation of intake

Method

- Quality improvement study (Sep–Dec 2024) using the Model for Improvement (Plan-Do-Study-Act) (Figure 1.)
- A clinical dietitian was embedded at an orthopedic ward to facilitate staff-led changes
- Primary aim:
 - ✓ ≥80% of patients at nutritional risk would meet their individual energy and protein requirements.
- Process indicators:
 - ✓ ≥80% of patients should be screened for nutritional risk using the NRS 2002 tool
 - ✓ ≥80% of those identified as nutritionally at risk should have their intake documented in the medical record.
- Baseline: Cohort data (2023) and pre-intervention data
- Interventions – see Figure 1.

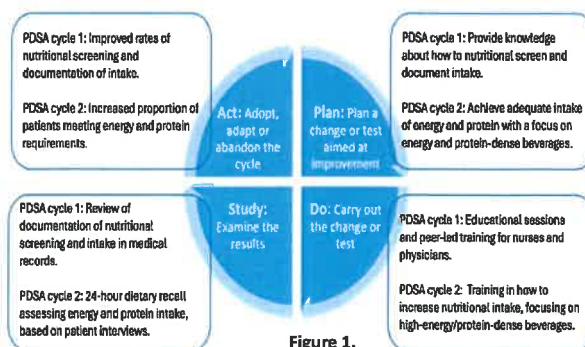


Figure 1.



Summary/ Highlights

A dietitian-supported, barrier-focused intervention using the PDSA model significantly improved nutritional screening, documentation, and intake in older hip fracture patients.

→ Even small, targeted changes can result in large improvements in nutritional care



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An increased intake of energy and protein from oral nutritional supplementation can improve muscle strength

The effect of high protein oral nutritional supplementation on muscle strength in older hip fracture patients at nutritional risk – preliminary results from a RCT

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ESPEN25-ABS-1475

Background

Malnutrition and dehydration are common in older hip fracture patients and can reduce the effectiveness of rehabilitation^{1,2}. The aim was to assess if an increased intake of energy and protein from ONS improves muscle strength during rehabilitation.

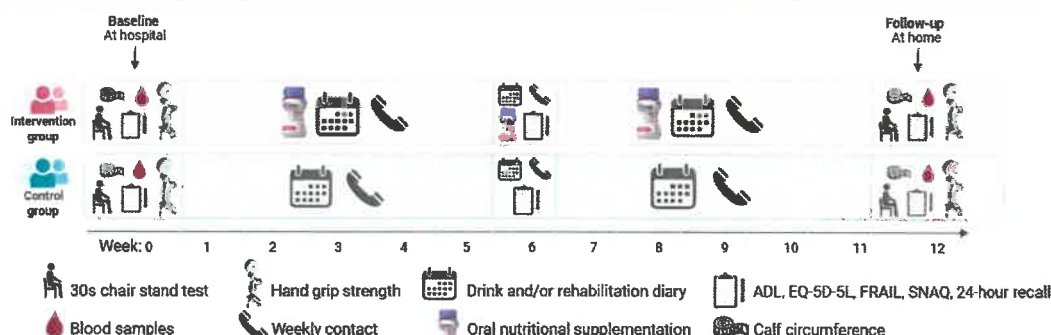
Method

Intervention

- Two bottles of 125 ml ONS pr. day *
- Providing 613 kcal, 37 g of protein
- Enriched with 3.5 g omega-3 and 20 µg vitamin D daily

Inclusion criteria

- Men and women
- Aged ≥ 65 years
- Admitted with a hip fracture
- At nutritional risk (NRS2002)
- Discharged with a rehabilitation plan



Results

A total of 112 participants were included.

Preliminary data have been reported for completed participants with >75% compliance (50%)

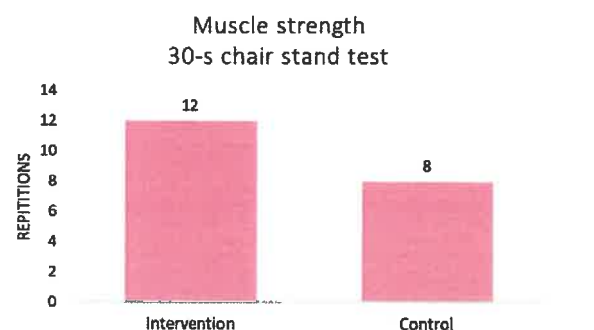
Table 1: Baseline Characteristics

Gender, female n (%)	66 (59)	Osmolarity dehydration, n (%)	55 (51)
Age (years)	80 (79,82)	Decreased HGS, n (%)	49 (44)
Frail, n (%)	45 (41)	Low muscle mass, n (%)	20 (25)
Low appetite - SNAQ, n (%)	50 (45)	Decreased strength 30-s CST, n (%)	112 (100)

Table 2: Between group comparison at 12-week follow-up

	Intervention (n=19)	Control (n=38)	P-value
30-s CST (repetitions)	12 (9-13)	8 (5-9)	0.0421
Energy intake (kcal)	2102 (1860-2451)	1658 (1535-1972)	0.0123
Protein intake (g)	91 (83-103)	60 (58-76)	<.0001
Omega-3 index (%)	12.1 (11.1-13.9)	6.4 (6.0-7.2)	<.0001
Osmolarity (mOsm/L)	293 (289-296)	296 (294-298)	0.0613

There were no difference in CRP, QoL, appetite, muscle mass, hand grip strength, ADL or frailty



Summary

Preliminary results showed that an increased energy and protein intake resulted in a clinically relevant improvement in muscle strength (>2 repetitions) in older hip fracture patients during rehabilitation.

Clinical message: implementing measures to improve compliance should be considered when ONS is initiated.

References

- Volpert D, Beck AM, Cederholm T, Cruz-Jentoft A, Goisler S, Hooper L, Klesavetter E, Maggio M, Raynaud-Simon A, Steier CC, Sobotta L, van Asselt D, With R, Bischoff SC. ESPEN guideline on clinical nutrition and hydration in geriatrics. Clin Nutr 2019; 38: 10-47.
- Malafarina V, Reginster JY, Cabrerizo S, Bruyère O, Kania JA, Alfredo Martinez J, Angeles Zola M. Nutritional status and nutritional treatment are related to outcomes and mortality in older adults with hip fracture. Nutrients 2018; 10.

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Other Information

ClinicalTrials.gov NCT05555876

* Nutridrink Compact Protein Omega 3
The study is supported by Nutricia DANONE



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