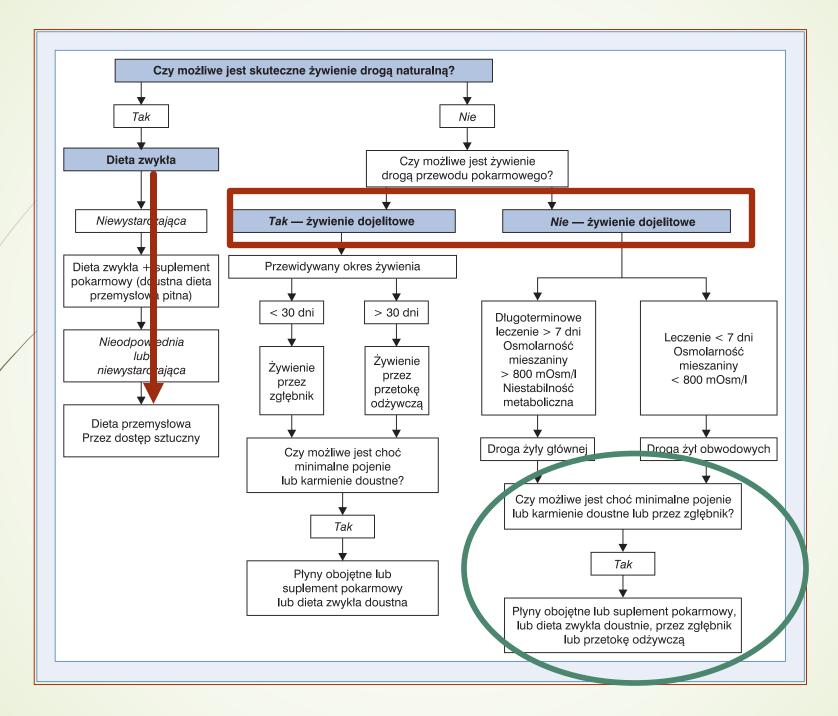
SPN – uzupełniające żywienie pozajelitowe: dla kogo i dlaczego?

Dr n. med. Paweł Kabata Klinika Chirurgii Onkologicznej Gdańskiego Uniwersytetu Medycznego



@chirurgpawel





Żywienie dojelitowe

Preferowana droga żywienia

Jedyna fizjologiczna metoda żywienia

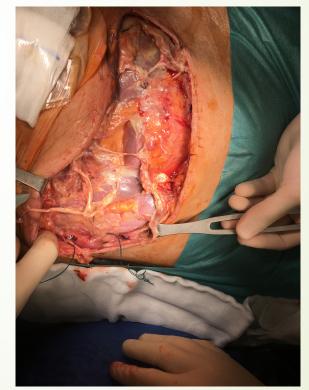
Głównym wskazaniem jest brak przeciwwskazań

Najlepsze, a jednak nie zawsze dobre

Zbyt mała podaż



Zbyt duże zapotrzebowanie

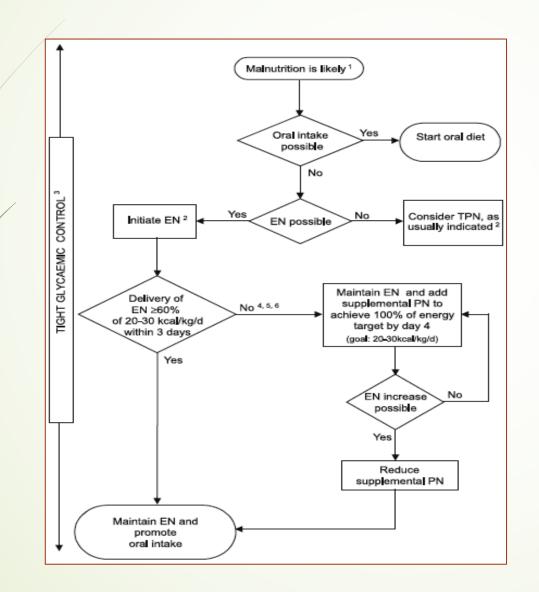


Recommendation 8:

If the energy and nutrient requirements cannot be met by oral and enteral intake alone (<50% of caloric requirement) for more than seven days, a combination of enteral and parenteral nutrition is recommended (GPP). Parenteral nutrition shall be administered as soon as possible if nutrition therapy is indicated and there is a

Weimann A. et al. ESPEN Guideline: Clinical nutrition in surgery. Clinical Nutrition 36 (2017) 623-650

Supplemental Parenteral Nutrition



Intensive Care Med (2007) 33:963–969 DOI 10.1007/s00134-007-0654-7	CLINICAL COMMENTARY
Claudia-Paula Heidegger Jacques-André Romand Miriam M. Treggiari Claude Pichard	Is it now time to promote mixed enteral and parenteral nutrition for the critically ill patient?



Wstrząs Porażenie jelit Insulinooporność

Zapotrzebowanie Zwiększona utrata Wczesne włączenie EN jako preferowane



O co w tym chodzi ??

- Stopniowe budowanie podaży drogą jelitową dostosowane do tolerancji żywienia przez chorego
- Minimalizacja strat białkowo-energetycznych
- Uzupełnienie drogą pozajelitową podaży energii i białka koniecznych do osiągnięcia 100% zapotrzebowania
- Deeskalacja PN w miarę budowy podaży EN



Pytanie tylko, czy to działa??

	Contents lists available at ScienceDirect	CLINICAL NUTRITION
2-2-2-	Clinical Nutrition	A children and an and a children and
ELSEVIER	journal homepage: http://www.elsevier.com/locate/clnu	() As the second and the forward there is a forward the second and the second an
Original article		

Supplemental parenteral nutrition improves immunity with unchanged carbohydrate and protein metabolism in critically ill patients: The SPN2 randomized tracer study

Mette M. Berger ^{a, *}, Olivier Pantet ^a, Nathalie Jacquelin-Ravel ^a, Mélanie Charrière ^a, Sabine Schmidt ^b, Fabio Becce ^b, Régine Audran ^c, François Spertini ^c, Luc Tappy ^d, Claude Pichard ^e



RESEARCH

Open Access

A randomized trial of supplemental parenteral nutrition in underweight and overweight critically ill patients: the TOP-UP pilot trial

Paul E. Wischmeyer^{1*}, Michel Hasselmann², Christine Kummerlen², Rosemary Kozar³, Demetrios James Kutsogiannis⁴, Constantine J. Karvellas⁵, Beth Besecker⁶, David K. Evans⁷, Jean-Charles Preiser⁸, Leah Gramlich⁹, Khursheed Jeejeebhoy¹⁰, Rupinder Dhaliwal¹¹, Xuran Jiang¹¹, Andrew G. Day¹¹ and Daren K. Heyland^{11,12,13}

Większa podaż energii i białka

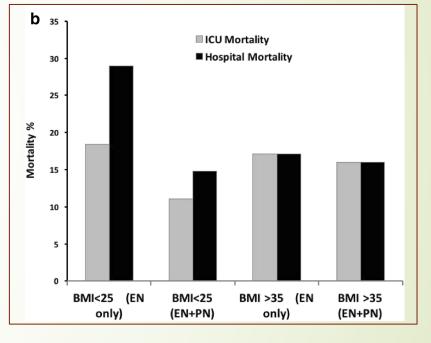
	EN only $(n = 71)$	SPN + EN (OLIMEL) (n = 49)	Difference mean, % (95% Cl)	p value
Evaluable days	11±7	11±8	0 (-2 to 3)	0.765
Evaluable days in first week	6 ± 2	6±2	0 (—1 to 1)	0.992
Calorie prescription	1844 ± 420	1728 ± 444	-116 (-275 to 42)	0.149
Protein prescription	106 ± 30	100 ± 31	-6 (-17 to 6)	0.319
% of prescribed kcal/protein rece	eived			
EN only				
Calories first 27 days	70 ± 26	67 ± 25	-3 (-12 to 7)	0.551
Calories first 7 days	68 ± 28	68 ± 27	-1 (-11 to 9)	0.905
Protein first 27 days	66 ± 26	60 ± 23	-5 (-14 to 3)	0.231
Protein in first 7 days	63 ± 26	61 ± 25	-3 (-12 to 7)	0.566
PN + EN				
Calories first 27 days	72 ± 25	90 ± 16	18 (11 to 25)	<0.001
Calories first 7 days	69 ± 28	95 ± 13	26 (18 to 34)	< 0.001
Protein first 27 days	68 ± 25	82 ± 19	13 (6 to 21)	< 0.001
Protein in first 7 days	64 ± 26	86 ± 16	22 (14 to 29)	< 0.001

Wischmeyer et al. Critical Care (2017) 21:142

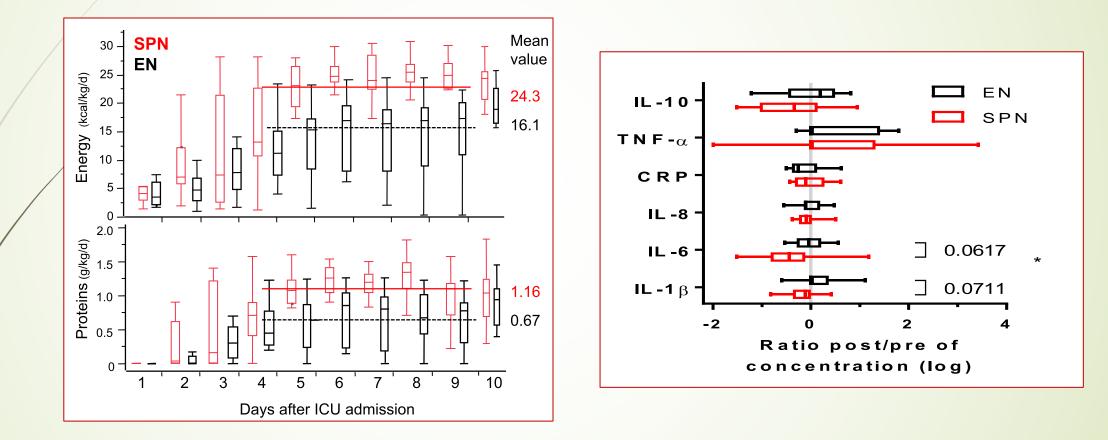
Wyniki końcowe

Table 7 Infection outcomes				
Variable	EN only (<i>n</i> = 73)	SPN + EN (OLIMEL) $(n = 52)$	<i>p</i> value	
Number of patients with a suspected infection	33/73 (45.2%)	26/52 (50.0%)	0.72	
Total number of suspected infections	83	78		
Average suspected infections per patient, \pm SD	1.7 ± 2.6	1.9 ± 2.6	0.62	
Number of patients with newly acquired infection	23/73 (31.5%)	14/52 (26.9%)	0.69	
Total number of newly acquired infections	46	38		

Table 8 Functional and quality-of-life outcomes						
Variable	EN only ($n = 73$)	SPN + EN (OLIMEL) $(n = 52)$	<i>p</i> -value			
Handgrip at ICU discharge	Unable (62) [unable-18]	9 (43) [unable-25]	0.21			
Handgrip at hospital discharge	Unable (56) [unable-20]	12 (36) [unable-33]	0.14			
6-minute walk test at hospital discharge	Unable (60) [unable–unable]	Unable (40) [unable-0]	0.20			
Barthel Index hospital discharge	46.5 ± 32.1 (41)	61.1 ± 32.4 (28)	0.08			



Wischmeyer et al. Critical Care (2017) 21:142



M. M. Berger et al. Clinical Nutrition doi 10.1016/j.clnu.2018.10.023

Do kogo będzie kierowane??

Intensywna terapia

Chirurgia górnego odcinka przewodu pokarmowego

Osoby skrajnie wyniszczone wprowadzane do żywienia dojelitowego

Rekonwalescencja po leczeniu powikłań chirurgicznych

Ale co to oznacza w chirurgii??



Zalecenia

In patients who require postoperative artificial nutrition, enteral feeding or a combination of enteral and supplementary parenteral feeding is the first choice (Grade A).

Recommendation 8:

If the energy and nutrient requirements cannot be met by oral and enteral intake alone (<50% of caloric requirement) for more than seven days, a combination of enteral and parenteral nutrition is recommended (GPP). Parenteral nutrition shall be administered as soon as possible if nutrition therapy is indicated and there is a

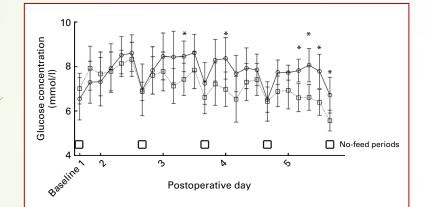


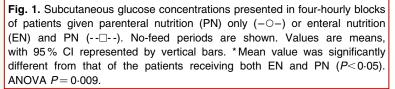
British Journal of Nutrition (2010), $\mathbf{103}, 1635{-}1641$ © The Authors 2010

doi:10.1017/S0007114509993631

Combining enteral with parenteral nutrition to improve postoperative glucose control

Paul Lidder¹, Daniel Flanagan², Simon Fleming³, Mark Russell⁴, Noel Morgan⁴, Tim Wheatley¹, Jo Rahamin¹, Steve Shaw⁵ and Stephen Lewis⁶*





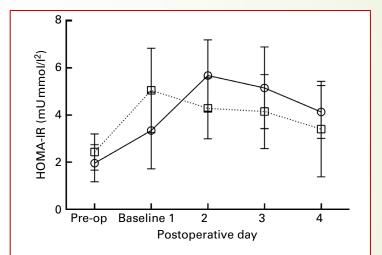


Fig. 2. Homeostasis model analysis-insulin resistance (HOMA-IR) measurements of patients given parenteral nutrition (PN) only $(-\bigcirc -)$ or enteral nutrition (EN) and PN $(-\Box -)$. Pre-op, preoperation. Values are means, with 95 % CI represented by vertical bars. ANOVA *P*=0.045.

Early combined parenteral and enteral nutrition for pancreaticoduodenectomy – Retrospective cohort analysis

Pascal Probst ^{a, b}, Daniel Keller ^a, Johannes Steimer ^a, Emanuel Gmür ^a, Alois Haller ^c, Reinhard Imoberdorf ^d, Maya Rühlin ^d, Hans Gelpke ^a, Stefan Breitenstein ^{a, *}

^a Department of Surgery, Cantonal Hospital Winterthur, Brauerstrasse 15, 8400 Winterthur, Switzerland
^b Department of General, Visceral and Transplantation Surgery, University of Heidelberg, Im Neuenheimer Feld 110, 69120 Heidelberg, Germany
^c Intensive Care Unit, Cantonal Hospital Winterthur, Brauerstrasse 15, 8400 Winterthur, Switzerland
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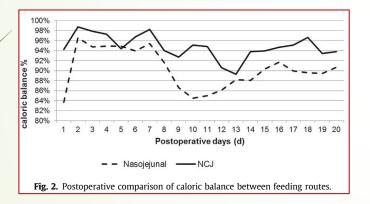


Table 2 Caloric intake.	
Nutritional balance (%) ^a Individual caloric deficit during hospitalization(kcal) ^b 25 kcal/kg achieved during hospitalization (overall days) 25 kcal/kg achieved during first seven postoperative days) ^a	93.4% (100%-69.3%) 754 (0-16350) 1081/1516 (71.3%) 6 (0-7)
Nutritional balance: the % coverage of kcal per patients related to the total cal hospitalization. ^a Median with range. ^b Mean with range.	oric requirements during the entire

Int J Clin Exp Med 2015;8(8):13937-13945 www.ijcem.com /ISSN:1940-5901/IJCEM0009709

Original Article Early enteral nutrition in combination with parenteral nutrition in elderly patients after surgery due to gastrointestinal cancer

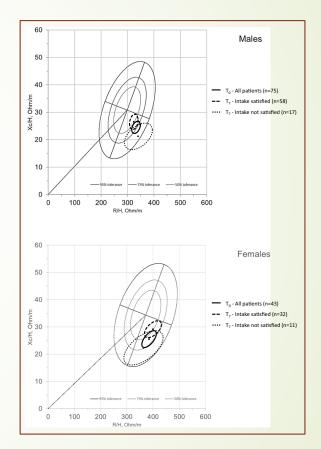
Table 2. Complications of patients in different groups							
Variables	EEN group	TPN group	EN+PN group	X ² 1 group	X ² 2 group	X ² 3 group	
Abdominal pain	6	5	7	0.108	0.094	0.402	
Abdominal distention	2	1	1	0.348	0.348	0	
Diarrhea	10	2	3	6.741**	4.899	0.215*	
Vomitting	4	1	2	1.938	0.729	0.348	
Nausea	1	0	0	1.014	0.014	-	
Infection	4	12	3	5.185*	0.159	6.873**	
Anastomotic leakage	0	0	0	-	-	-	

Note: X²1: between EEN group and TPN group; X²2: between EEN group and EN+PN group; X²3: between TPN group and EN+PN group; *P < 0.05; **P < 0.01.



In conclusion, early 7-day SPN resulted in improved body composition and HG and PAB levels in hypophagic, hospitalized cancer patients at nutritional risk, the majority of whom were in advanced disease stage, in the absence of any relevant clinical complications. Full attainment of both calorie and protein requirements may be a key issue in the initial improvement of nutritional status in this patient population. Further

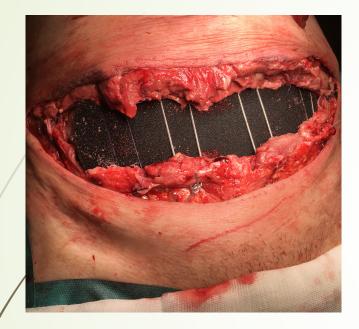
Endpoints	Baseline Mean (SD)	Day 7 Mean (SD)	Mean change (95% CI)	<i>p</i> value
Phase angle (°)	4.12 (1.23)	4.37 (1.30)	0.25 (0.11-0.39)	0.00
Standardized phase angle	- 1.58 (1.55)	-1.25 (1.75)	0.33 (0.13-0.53)	0.00
Body weight (kg)	57.1 (11.2)	57.8 (11.4)	0.7 (0.4–1.1)	< 0.00
Body mass index (kg m ⁻²)	20.3 (3.6)	20.6 (3.6)	0.3 (0.1–0.4)	< 0.00
Handgrip strength (kg)	18.8 (9.3)	20.9 (9.3)	2.1 (1.3–2.8)	< 0.00
Prealbumin (mg/dL)	16.4 (7.5)	20.2 (10.2)	3.8 (2.1–5.6)	< 0.00



Support Care Cancer. 2019 Jul;27(7):2497-2506.













Jak to robimy??

Usunięcie przełyku z powodu raka

Rozległy zabieg w obrębie trzech jam ciała

Niedożywienie (BMI <18, utrata masy ciała >10%), liczne choroby współistniejące

Przygotowanie ONS przed operacją

Mężczyzna 60 kg m.c, 185 cm wzrostu, BMI 17.5

Zapotrzebowanie ok 1800 kcal , 90 g białka (30 kcal/kg; 1.5 g/kg)

EN – jejunostomia, dieta peptydowa 1 kcal/ml, 16 godz/d

PN – worek indywidualny mieszalnikowy

Jak to robimy??

		EN	PN	EN	PN	% E	% B
	POD 1	10-20 ml/h	50% EPR	250 kcal; 10 g B	900 kcal; 45 g B	64%	61%
/	POD 2	30-40 ml/h	50% EPR	500 kcal; 20 g B	900 kcal; 45 g B	77%	72%
	POD 3	40-60 ml/h	50% EPR	750 kcal; 30 g B	900 kcal; 60 g B	92%	100%
	POD 4	60-70 ml/h	40% EPR	1000 kcal; 40 g B	700 kcal; 40 g B	100%	100%
		+ONS	Ļ	300 kcal, 20 g B			

Zalety

- Osoby z większą masą ciała i dużym zapotrzebowaniem energetyczno-białkowym
- Zła tolerancja diety dojelitowej
- Jejunostomia
- Leczenie powikłań, nieszczelności zespoleń
- Powrót do zdrowia po leczeniu powikłań rozszerzanie diety doustnej

Konieczność adaptacji

- Większe ryzyko przeżywiania
- Ważniejsze jest zwiększanie EN niż PN
- Możliwe jest SPN PN+ON
- Włączanie żywienia doustnego wg protokołów ERAS
- Jaka minimalna wielkość worka PN??



Gorąco zachęcam do stosowania

Pytania??