Intenzivna nega bolesnika sa respiratornom insuficijencijom-ISHRANA

Dr Mr Natalija Vuković
Klinika za anesteziju i intenzivnu terapiju UKC Niš

PER OS

EN

PN

RESPIRATORNA INSUFICIJENCIJA

TIP MEDICINSKE NUTRITIVNE TERAPIJE

PER OS **EN** **PN**

Metaboličke promene kod HOPB pacijenata

- GUBITAK TELESNE MASE
- POVEĆANA POTROŠNJA ENERGIJE U MIROVANJU (REE)

Promene u sastavu tela

- GUBITAK SLOBODNOG MASNOG TKIVA

Schols AM et al. American Review of Respiratory disease 1993;147 (5):1151-6

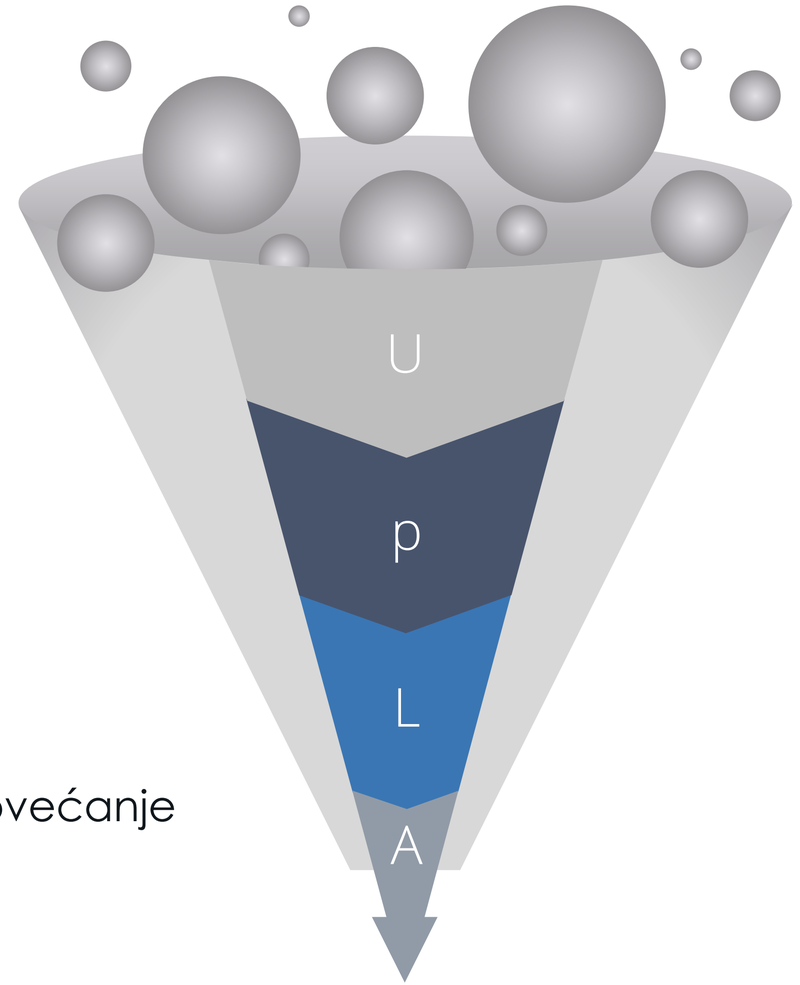
UZROCI POTHRANJENOSTI U HOBP

SMANJEN UNOS

- Smanjen unos hrane uzrokovan dispnejom
- Smanjen apetit
- Aerofagija

POVEĆANA POTROŠNJA

- Povećana REE
- Povećan disajni rad
- Hipoksemijom uzrokovano povećanje inflamacije
- Povećana temperatura



LEKOVI

- Kortikosteroidi
- Simpatikomimetici
- Diuretici

APSORPCIJA

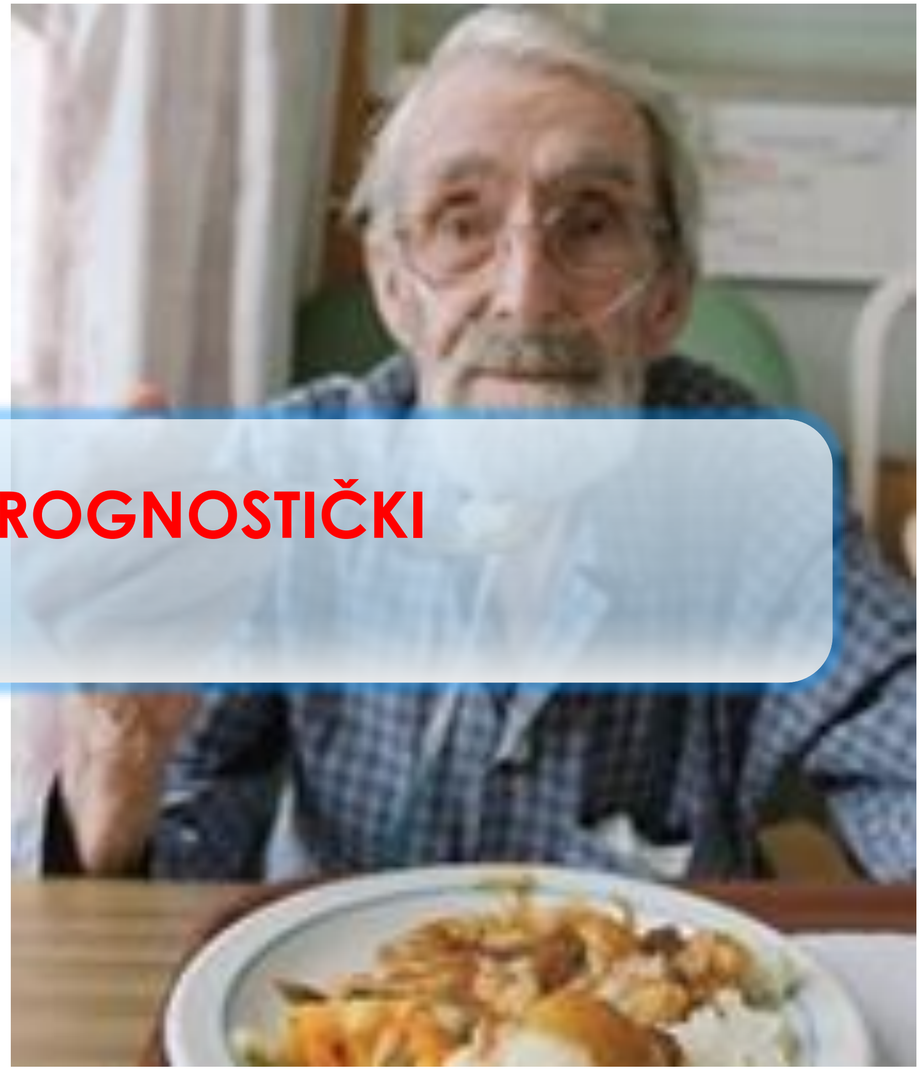
- Smanjena apsorpcija nutrijenata uzrokovana hipoksemijom

UČESTALOST POTHRANJENOSTI

Van bolnice
25%

U bolnici
50%

U JIL
60-70%



POTHRANJENOST JE NEGATIVNI PROGNOSTIČKI FAKTOR U HOBP

Hallin R et al. Respir Med 2007. 101;1954-60.

Eur Respir J 2006; 27: 689–696
DOI: 10.1183/09031936.06.00076405
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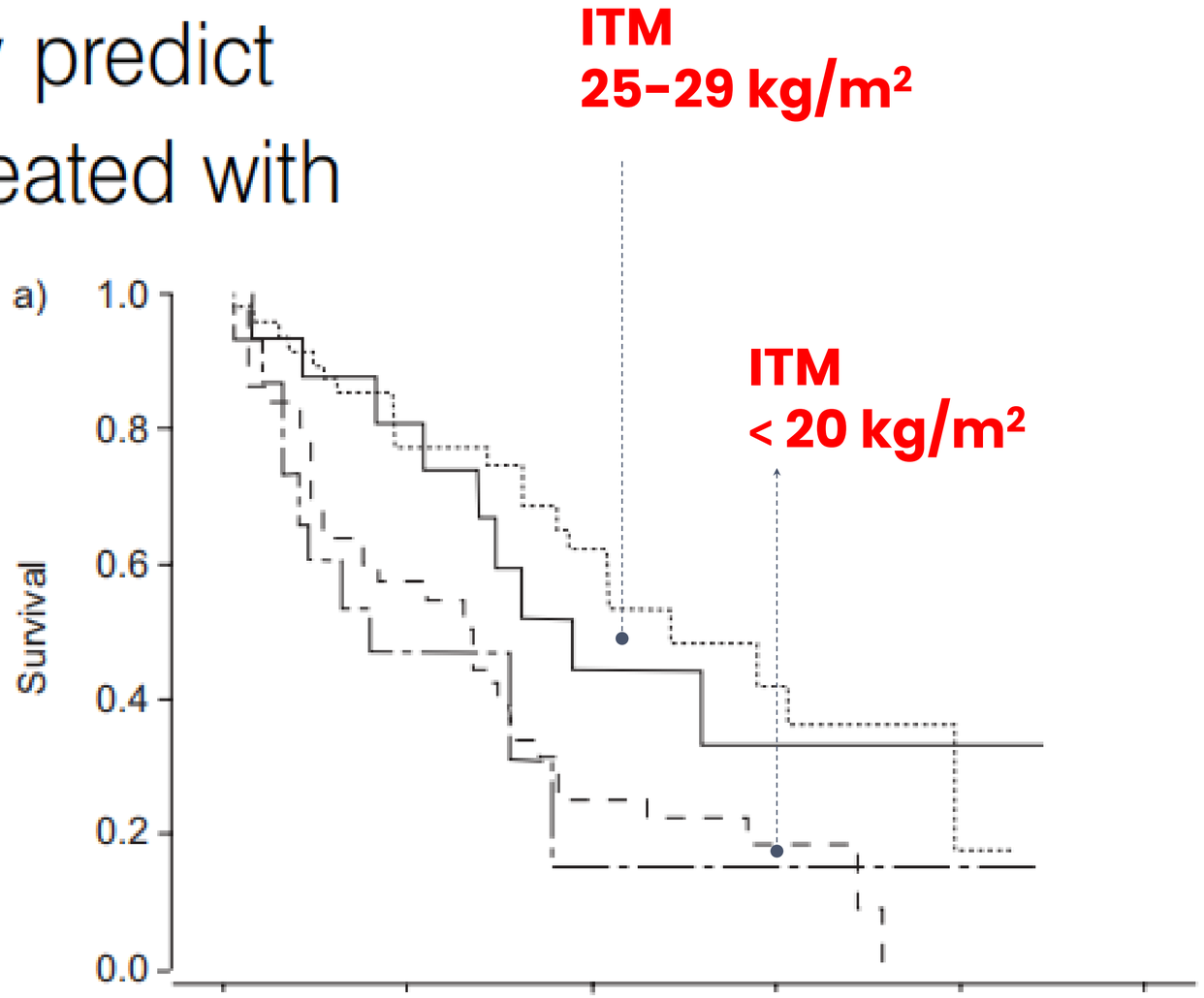
Body weight and comorbidity predict mortality in COPD patients treated with oxygen therapy

S. Marti*, X. Muñoz*, J. Rios#, F. Morell* and J. Ferre

Odnosi se na umereno i srednje težak oblik HOBP!



FVC 1 < 30 % Decreased physical activity	Dependency for daily living activities
	Can't dress himself
	Can't climb a few steps without stopping
	Walk less than 30' a day
Health resources consumption	3 or more severe exacerbations (ER and / or hospitalization) last year
	More than 21 days in hospital last year
Afected general status	Comorbidities
	BMI < 21 kg/m2
	Dyspnea
	BODE Index 7-10
Personal and social situation	Advanced age
	Depression
	Living alone

Profil pacijenta koji može umreti unutar 6-12meseci

EPOC SEPAR guideline 2010.

Cochrane Database of Systematic Reviews

Nutritional supplementation for stable chronic obstructive pulmonary disease

Cochrane Systematic Review - Intervention | Version published: 12 December 2012 see what's new
https://doi.org/10.1002/14651858.CD000998.pub3

New search Conclusions changed
Am score 16 Used in 21 guidelines View article information

Ivone M Ferreira | Dina Brooks | John White | Roger Goldstein
View authors' declarations of interest

We found moderate-quality evidence that nutritional supplementation promotes significant weight gain among patients with COPD, especially if malnourished. Nourished patients may not respond to the same degree to supplemental feeding. We also found a significant change from baseline in fat-free mass index/fat-free mass, fat mass/fat mass index, MAMC (as a measure of lean body mass), six-minute walk test and a significant improvement in skinfold thickness (as measure of fat mass, end score) for all patients. In addition, there were significant improvements in respiratory muscle strength (MIP and MEP) and overall HRQoL as measured by SGRQ in malnourished patients with COPD.

These results differ from previous reviews and should be considered in the management of malnourished patients with COPD.

NUTRITIVNA SUPLEMENTACIJA

Collins P et al. Am J Clin Nutr 2012.95 (6).1385-95.

Povećavaju mišićnu snagu

http://goldcopd.org

Povećavaju snagu respiratorne muskulature

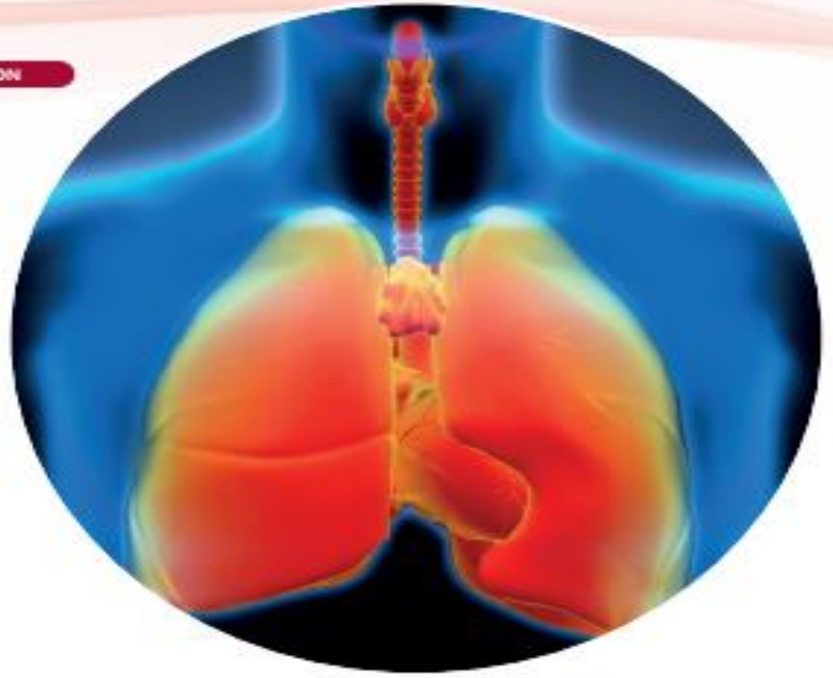
Povećavaju telesnu masu

Ferreira M, et al. Cochrane Data Base Sys Rev 2012;12.

Poboljšavaju kvalitet života

Collin P. Respirology 2013. 18:616-29.

2nd EDITION



Managing Malnutrition in COPD

Including a pathway for the appropriate use of ONS to support community healthcare professionals

www.malnutritionpathway.co.uk/copd/

2nd Edition: January 2020
1st Edition produced June 2016
(Document to be reviewed January 2023)

Pathway for Using Oral Nutritional Supplements (ONS) in the Management of Malnutrition in COPD

Low BMI (<20 kg/m²) or at high risk ('MUST' score 2 or above) of malnutrition [6,32,60]

↓

Record details of malnutrition risk (screening result/risk category, or clinical judgement)
Agree goals of intervention with individual/carer
Consider underlying symptoms and cause of malnutrition e.g. nausea, infections and treat if appropriate
Consider social requirements e.g. ability to collect prescription
Reinforce advice to optimise food intake*, confirm individual is able to eat and drink and consider any physical issues e.g. dysphagia, dentures

↓

Prescribe:

Average 2 ONS per day [58-59] ** **in addition to oral intake (or 1 'starter pack', then 60 of the preferred ONS per month)**

12 week duration according to clinical condition/nutritional needs [1,32,58]

Patients may benefit from a high protein, high energy, low volume ONS in addition to dietary advice due to symptoms of COPD [43]

If following a pulmonary rehabilitation programme consider increased energy and protein requirements

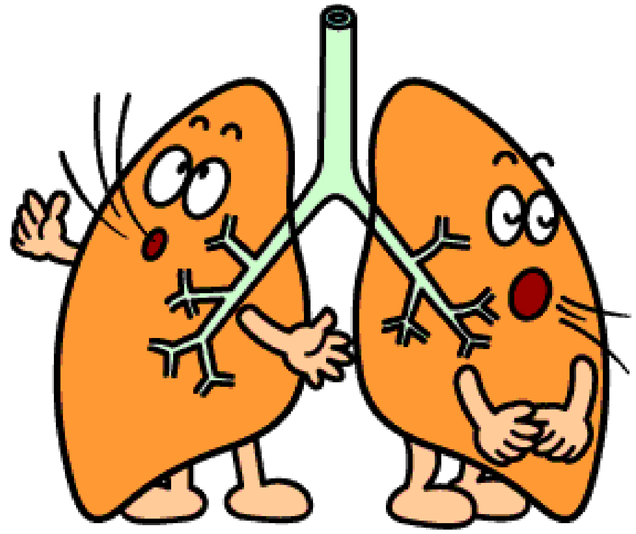
↓

Koji nutritivni suplementi?

Respiratorni koeficijent=VCO2/VO2

$RQ_{CHO}=1$

$RQ_{Lipida}=0.7$



Primarna **ideja je bila da treba koristiti suplemente sa manje CHO, a** više lipida, zasnovanih na ideji različitog respiratornog koeficijenta ovih makrosupstanci.

Kasnija istraživanja pokazala su da je ovakav klinički uticaj možda prenaglašen, te **da nutritivni sulementi bogati CHO nisu doveli do postprandijalnog gubitka daha**.

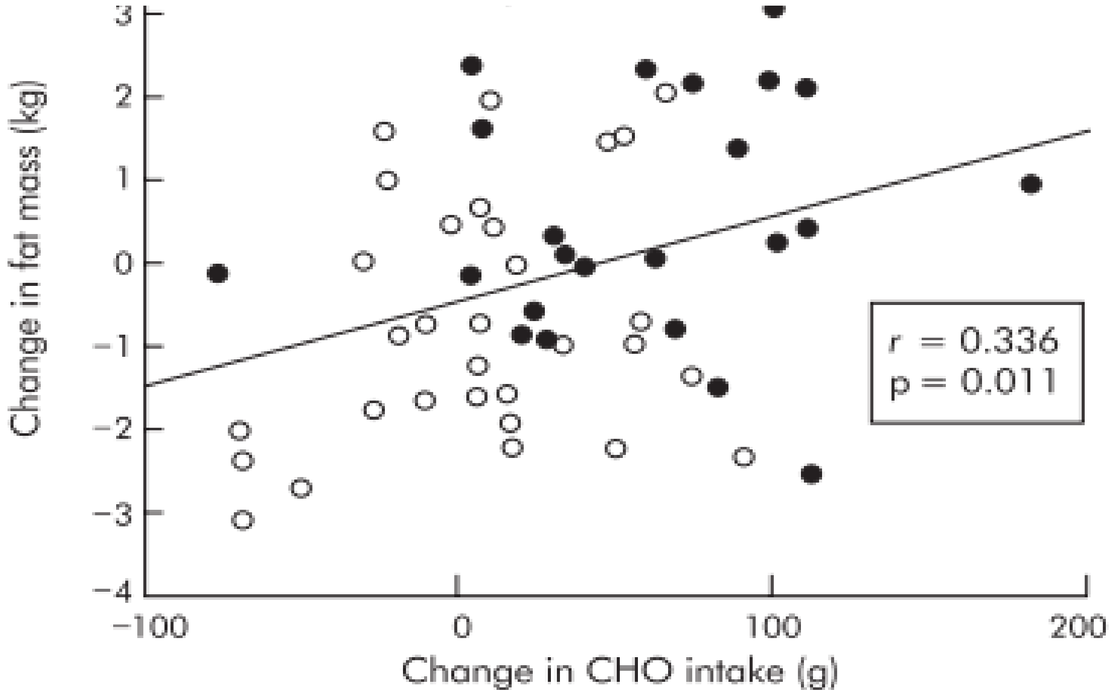
Efthimiou J et al. Thorax 1992.47(6);451-6.
Vermeeren MA et al. Am J Clin Nutr 2001.73(2);295-301.

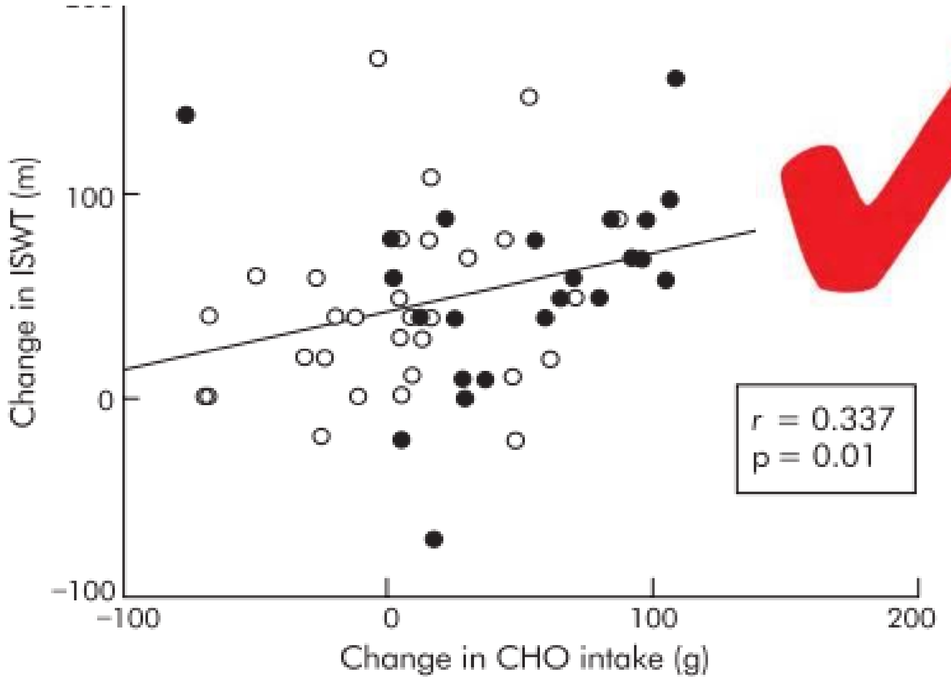
CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Nutritional enhancement of exercise performance in chronic obstructive pulmonary disease: a randomised controlled trial

M C Steiner, R L Barton, S J Singh, M D L Morgan

Thorax 2003;**5**





aspen LEADING THE SCIENCE AND PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition

I1. We suggest that specialty high-fat/low-carbohydrat formulations designed to manipulate the respirator quotient and reduce CO_2 production not be used in ICU patients with acute respiratory failure (not to be confused with recommendation E3).

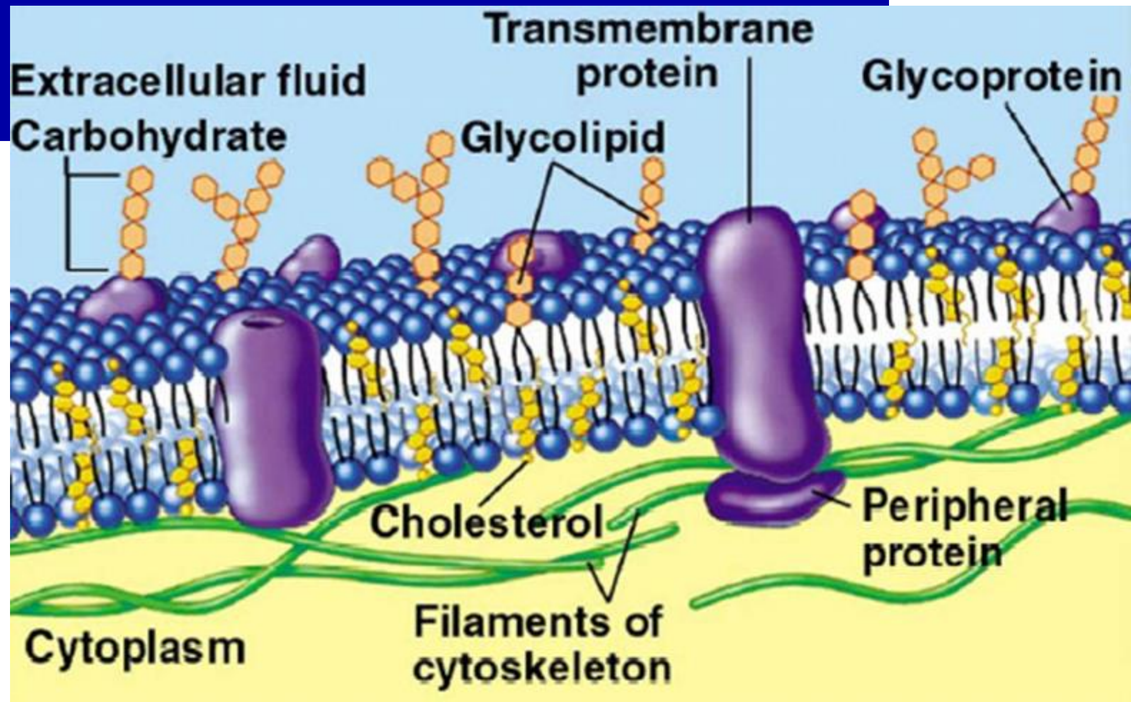
I2. Based on expert consensus, we suggest that fluid-restricted energy-dense EN formulations be considered for patients with acute respiratory failure (especially if in a state of volume overload).

I3. Based on expert consensus, we suggest that serum phosphate concentrations should be monitored closely and phosphate replaced appropriately when needed.

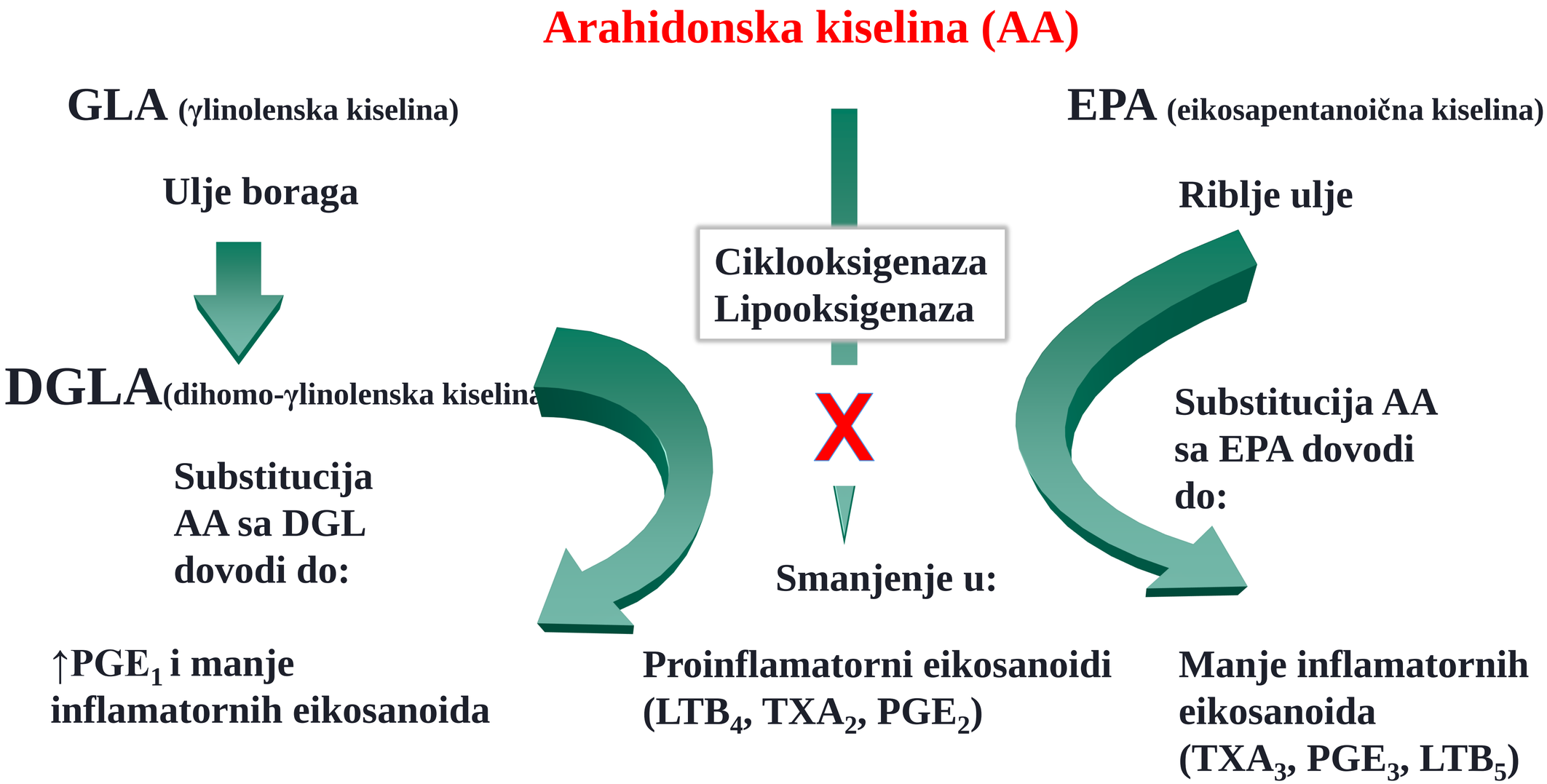
JPEN J Parenter Enteral Nutr 2017. 40(2): 159-211.

Ω-3 Masne kiseline

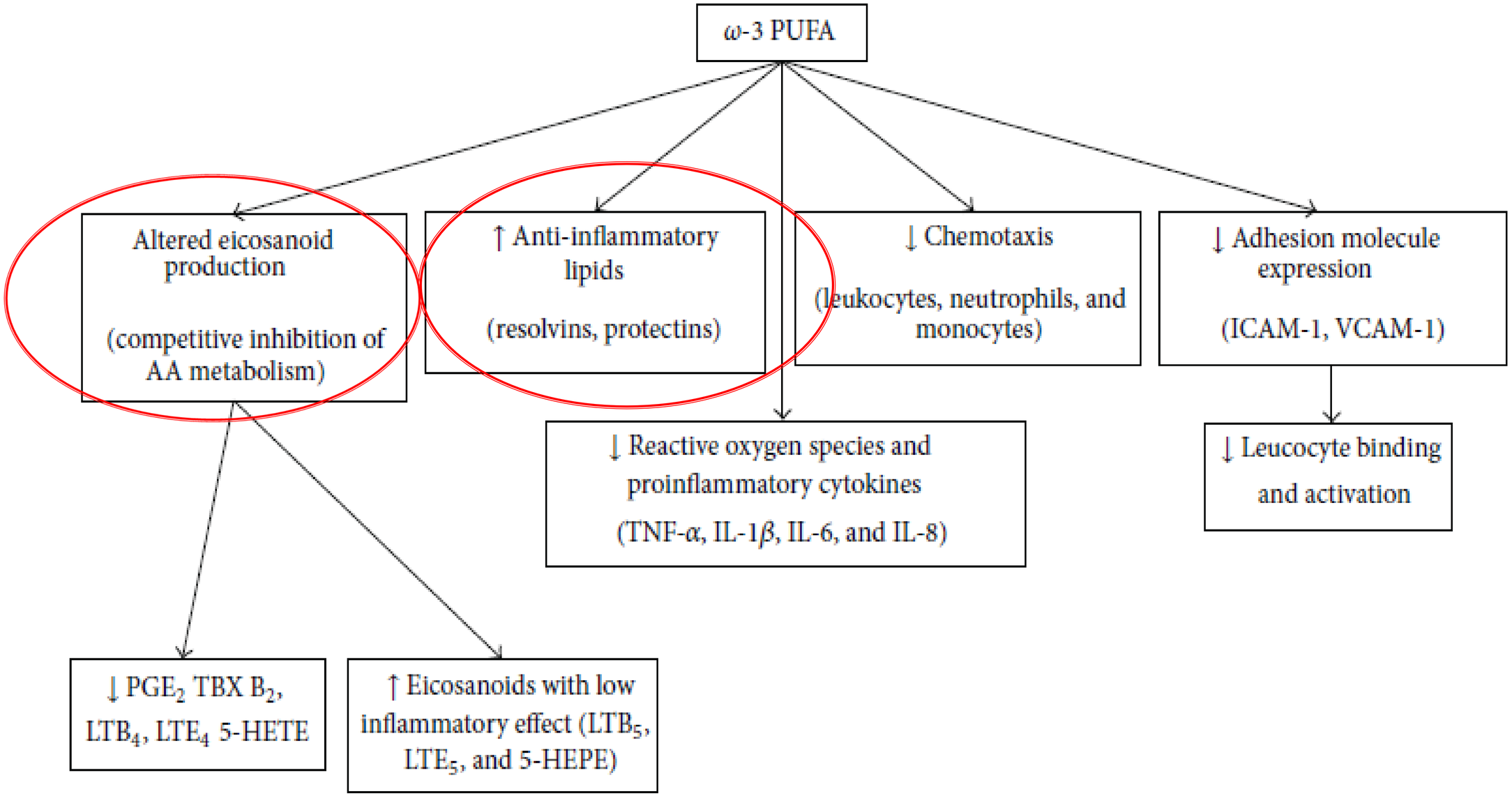
- Sinteza medijatora zapaljenja zavisi od sadržaja arahidonske kiseline (AA) u ćelijskoj membrani inflamatornih ćelija
- Moguće je promeniti sadržaj AA ćelijske membrane inflamatornih ćelija promenom lipidnog sastava nutricije



Ω-3 Masne kiseline



Ω-3 Masne kiseline

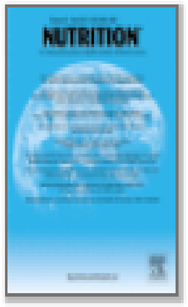


Garcia de Acilu et al. Biomed Res Int 2015. 2015: 653750.

ELSEVIER

Nutrition

Volume 61, May 2019, Pages 84-92



Review

Omega-3 polyunsaturated fatty acids in critically ill patients with acute respiratory distress syndrome: A systematic review and meta-analysis

Pascal L. Langlois MD [a], Fréderick D'Aragon MD, MSc, FRCPC [a], Gil Hardy PhD, FRSC, FASPEN [b], William Manzanares MD, PhD [c]

- 12 randomizovanih studija
- 1280 pacijenata
- Posle 1999.

Study or Subgroup	n-3 PUFAs Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI	Year
Gadek 1999	216.7	90.8	45	168.8	63.1	49	19.1%	47.90 [16.03, 79.77]	1999
Singer 2006	317.3	99.5	41	214.3	56.4	42	18.2%	103.00 [68.09, 137.91]	2006
Pontes-Arruda 2006	227.5	203.8	54	156.6	111.1	48	11.3%	70.90 [8.11, 133.69]	2006
Gupta 2011	177.2	94.1	27	151.8	80.2	26	14.9%	25.40 [-21.61, 72.41]	2011
Stapelton 2011	215.4	92.8	30	174	63.4	36	17.0%	41.40 [2.26, 80.54]	2011
Kagan 2015	227.2	67.8	56	213.7	85.6	48	19.6%	13.50 [-16.53, 43.53]	2015
Total (95% CI)			**253**			**249**	**100.0%**	**49.33 [20.88, 77.78]**	

Heterogeneity: Tau² = 841.33; Chi² = 16.11, df = 5 (P = 0.007); I² = 69%
Test for overall effect: Z = 3.40 (P = 0.0007)

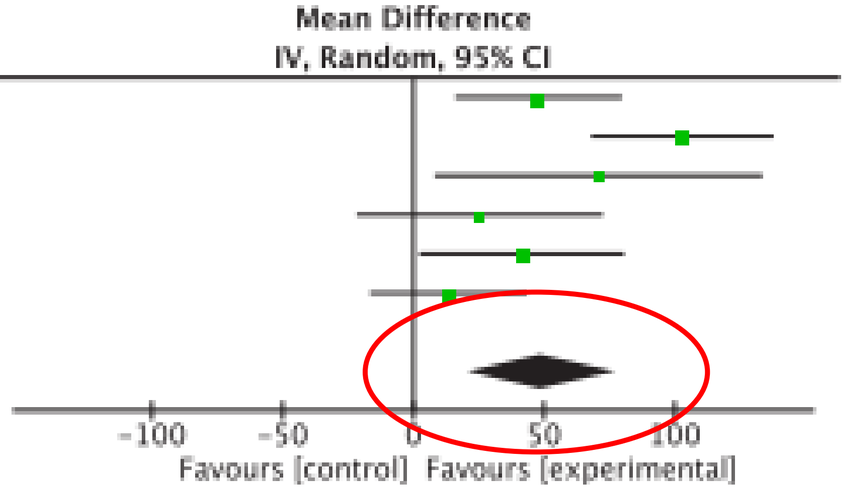


Fig. 2. Effects of fish oil on early PaO_2/FiO_2 in acute respiratory distress syndrome. CI, confidence interval; df, degrees of freedom; IV, instrumental variables; PUFA, polyunsaturated fatty acids; SD, standard deviation.

Study or Subgroup	n-3 PUFAs Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI	Year
Gadek 1999	197.8	80.1	31	154.17	70.9	32	19.5%	43.63 [6.23, 81.03]	1999
Pontes-Arruda 2006	224.4	68.4	34	151.9	107.6	27	16.2%	72.50 [25.85, 119.15]	2006
Singer 2006	296.5	165.3	34	236.3	79.8	33	11.9%	60.20 [-1.67, 122.07]	2006
Stapelton 2011	197.6	63.4	15	205.4	74.9	27	17.5%	-7.80 [-50.55, 34.95]	2011
Gupta 2011	159.5	109.9	23	145.2	109.5	20	11.0%	14.30 [-51.43, 80.03]	2011
Kagan 2015	188.9	56	41	187.8	65.2	39	23.9%	1.10 [-25.59, 27.79]	2015
Total (95% CI)			**178**			**178**	**100.0%**	**27.87 [0.75, 54.99]**	

Heterogeneity: Tau² = 615.96; Chi² = 11.52, df = 5 (P = 0.04); I² = 57%
Test for overall effect: Z = 2.01 (P = 0.04)

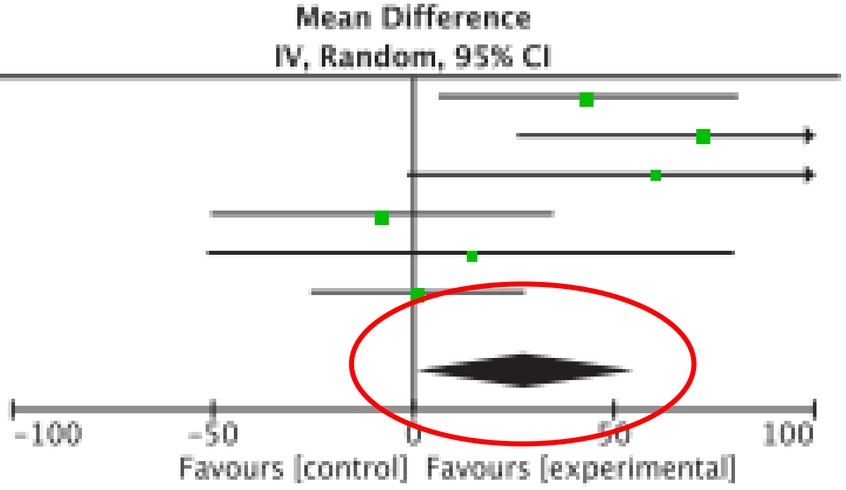


Fig. 3. Effects of fish oil on late PaO_2/FiO_2 in acute respiratory distress syndrome. CI, confidence interval; df, degrees of freedom; IV, instrumental variables; PUFA, polyunsaturated fatty acids; SD, standard deviation.

Langlois et al. Nutrition 2019. 61: 84-92.

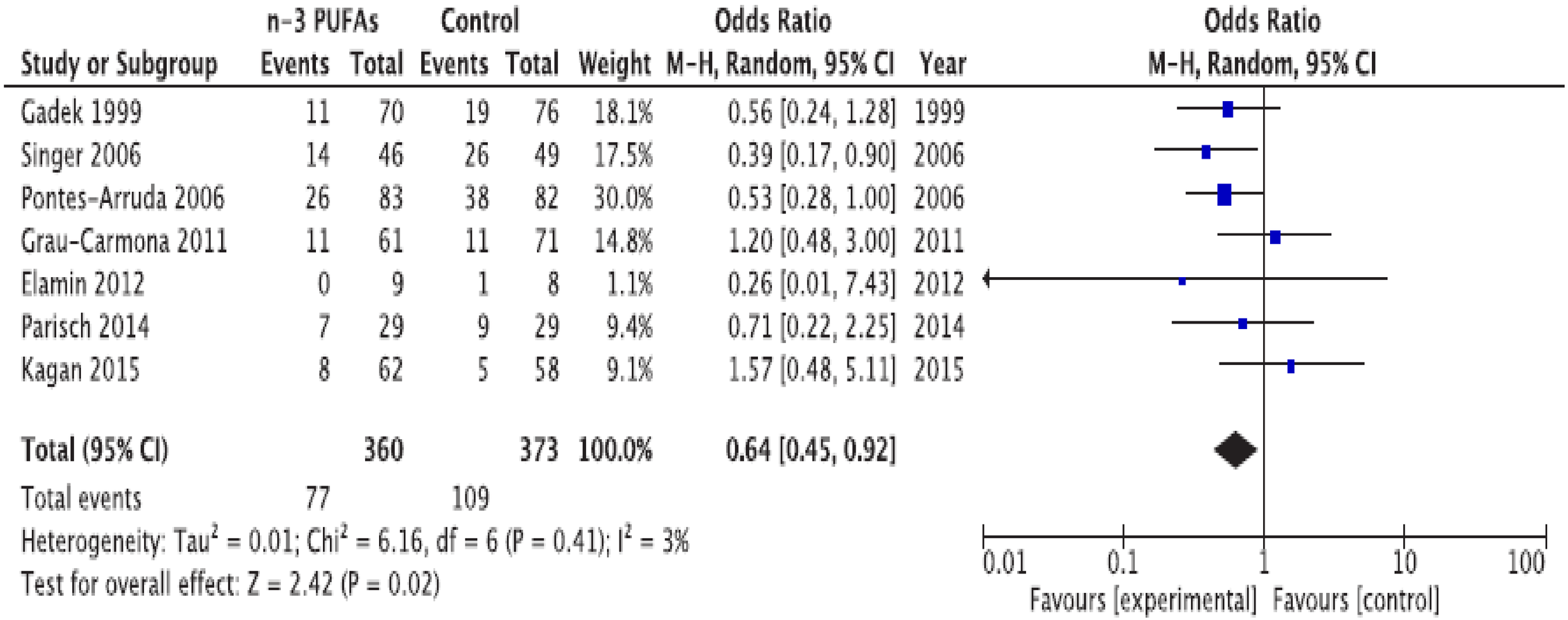


Fig. 7. Effect of enteral fish oil on mortality in acute respiratory distress syndrome: Sensitivity analysis restricted to continuous infusion. CI, confidence interval; df, degrees of freedom; M-H, Mantel-Haenszel test; PUFA, polyunsaturated fatty acids.

Langlois et al. Nutrition 2019. 61: 84-92.

Koji nutritivni suplementi?

- POVEĆAN KALORIJSKI I PROTEINSKI UNOS
- MANJE „VODE“
- Ω-3 MASNE KISELINE

EN

ESPEN
European Society for Clinical Nutrition and Metabolism

Preporuka 31:

Enteralne formure obogaćene omega-3 masnim kiselinama mogu se davati unutar nutritivnih doza.

Nivo preporuke: 0- jak konsenzus (95% saglasnosti)

PN

Preporuka 33:

Parenteralne lipidne emulzije obogaćene sa EPA+DHA (doza ribljeg ulja 0.1-0.2g/kg/dan), mogu se davati pacijentima koji primaju PN.

Nivo preporuke: 0- jak konsenzus (100% saglasnosti)

Singer P et al. Clin Nutr 2019. 38 (1);48-79.

EN

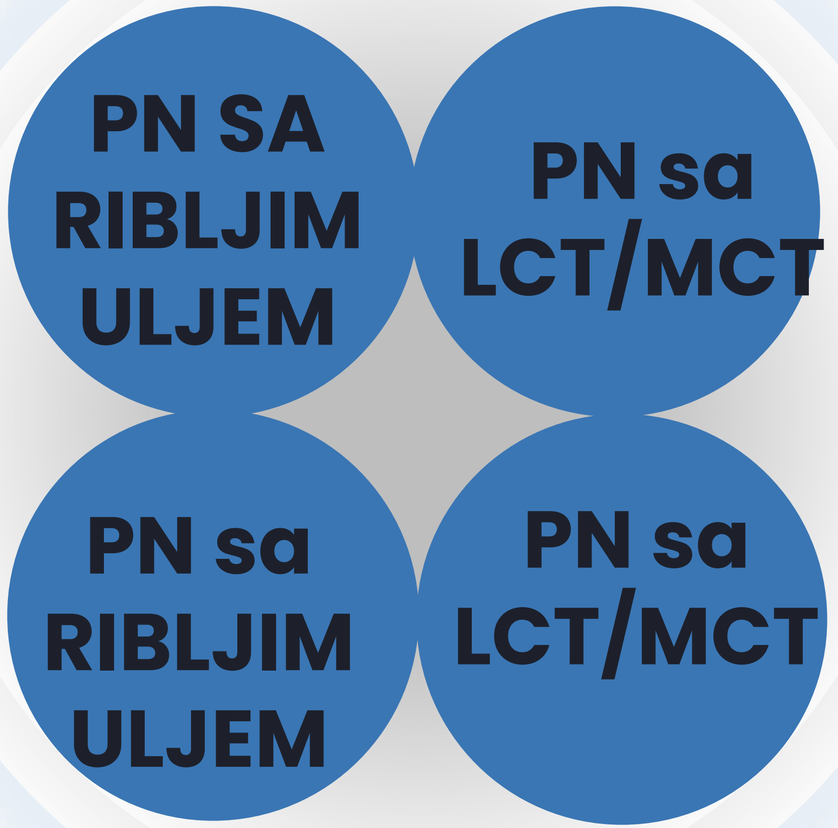
-U poređenju sa standardnim formulama bogatim sadržajem masti, enteralne formule sa ribljim uljem i antioksidantima, smanjuju mortalitet kod pacijenata sa ARDS-om i sepsom.

-Ove formule mogu biti povezane sa smanjenjem dužine zadržavanja u bolnici, a povezane su sa smanjenjem dužine trajanja mehaničke ventilacije.

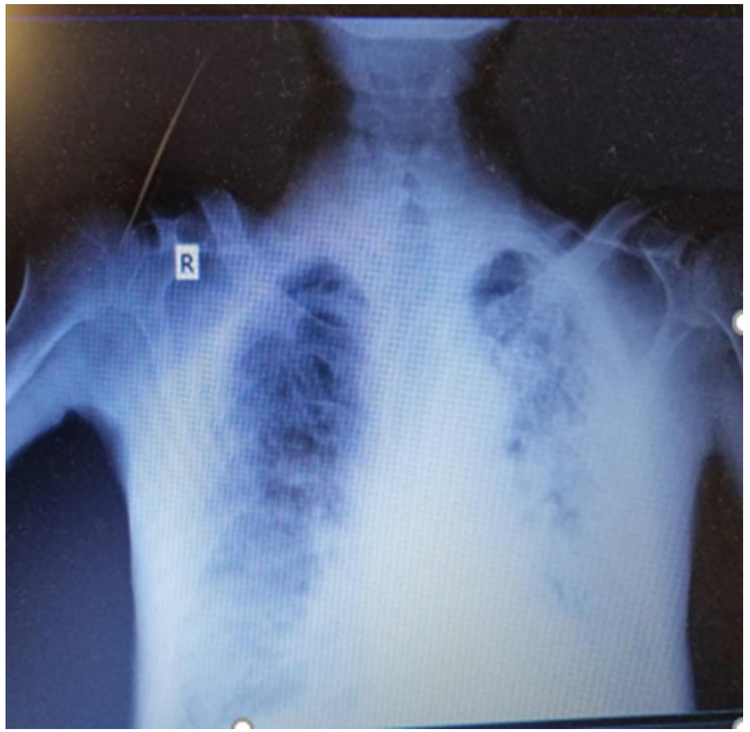
Critical Care Nutrition

↓DUŽINU BOLNIČKOG LEČENJA
I STOPU INFEKCIJA

MOGU ↓ DUŽINU MEHANIČKE
VENTILACIJE



ZAKLJUČAK



- GUBITAK MIŠIĆNE MASE
- POVEĆAN REE
- POVEĆAN MORTALITET KOD POTHRANJENIH

- POVEĆAN KALORIJSKI I PROTEINSKI UNOS
- MANJE „VODE“
- Ω-3 MASNE KISELINE