REGION SJÆLLAND
SJÆLLANDS UNIVERSITETSHOSPITAL
– vi er til for dig

DSKE
DANSK SELSKAB for KLINISK ERNÆRING

DANSK SELSKAB FOR KLINISK ERNÆRING INVITERER TIL TVÆRFAGLIGT INITIATIVMØDE OM

ERNÆRING TIL DEN SVAGE PATIENT

TORSDAG D. 21. MARTS 2024 KL. 16.00 – 18.30

AFHOLDES I AUDITORIET PÅ SJÆLLANDS UNIVERSITETS HOSPITAL, KØGE
ADRESSE: LYKKEBÆKVEJ 1, 4600 KØGE

REGION SJÆLLAND
SJÆLLANDS UNIVERSITETSHOSPITAL
– vi er til for dig

DSKE
DANSK SELSKAB for KLINISK ERNÆRING

PROGRAM

16.00 Velkomst
Ines Raben, Klinisk Diætist, Cand. scient Medicinsk Afdeling, Sjælland Universitets Hospital Køge og Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

16.10 Patienten i ernæringsrisiko
Mette Holst, Professor, Ph.D., og Henrik Højgaard Rasmussen, Overlæge, Professor, Center for Ernæring og Tarmsvigt, Aalborg Universitets Hospital

16.40 Ernæring til den kritisk syge patient – opdaterede guidelines
Jørgen Wiis, Overlæge, EDIC, Afdeling for Intensiv behandling 4131, Center for kræft og organsygdomme, Rigshospitalet

17.10 Pause

PROGRAM

17.20 Ernæring til den kirurgiske risiko patient
Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

17.40 Indsats i forhold til ernæringsrisiko og dehydrering i akutmodtagelsen (NYT-I-AMA)
Martine K. Nielsen, Klinisk Diætist, Cand.scient, Emma D.M. Pedersen, Klinisk Diætist og Anne Marie Beck, seniorforsker, klinisk diætist, Ph.D., EATEN, Herlev Gentofte Universitetshospital

18.10 Afrunding og fremtidige DSKE arrangementer

18.15 Let traktement og networking

REGION SJÆLLAND
SJÆLLANDS UNIVERSITETSHOSPITAL
– vi er til for dig

DSKE
DANSK SELSKAB for KLINISK ERNÆRING

PROGRAM

16.00 Velkomst
Ines Raben, Klinisk Diætist, Cand. scient Medicinsk Afdeling, Sjælland Universitets Hospital Køge og Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

16.10 Patienten i ernæringsrisiko
Mette Holst, Professor, Ph.D., og Henrik Højgaard Rasmussen, Overlæge, Professor, Center for Ernæring og Tarmsvigt, Aalborg Universitets Hospital

16.40 Ernæring til den kritisk syge patient – opdaterede guidelines
Jørgen Wiis, Overlæge, EDIC, Afdeling for Intensiv behandling 4131, Center for kræft og organsygdomme, Rigshospitalet

17.10 Pause

ERNÆRING TIL DEN SVAGE PATIENT

Patienten i Ernæringsrisiko

TORSDAG D. 21. MARTS 2024

SJÆLLANDS UNIVERSITETS HOSPITAL, KØGE

Mette Holst
Professor, Forskningsleder, PhD
Center for Ernæring og Tarmsvigt,
Aalborg Universitetshospital
og Klinisk Institut, Aalborg Universitet

Henrik Højgaard Rasmussen
Professor, Ledende Overlæge, PhD
Center for Ernæring og Tarmsvigt,
Aalborg Universitetshospital
Klinisk Institut, Aalborg Universitet, EATEN, Herlev

AALBORG UNIVERSITETSHOSPITAL – i gode hænder

AALBORG UNIVERSITET

DANSC Danish Nutrition Science Center

Agenda

- Patienten i ernæringsrisiko
  - Baggrund og bidragende faktorer
  - Opsporing af patienter i ernæringsrisiko, - hvordan?

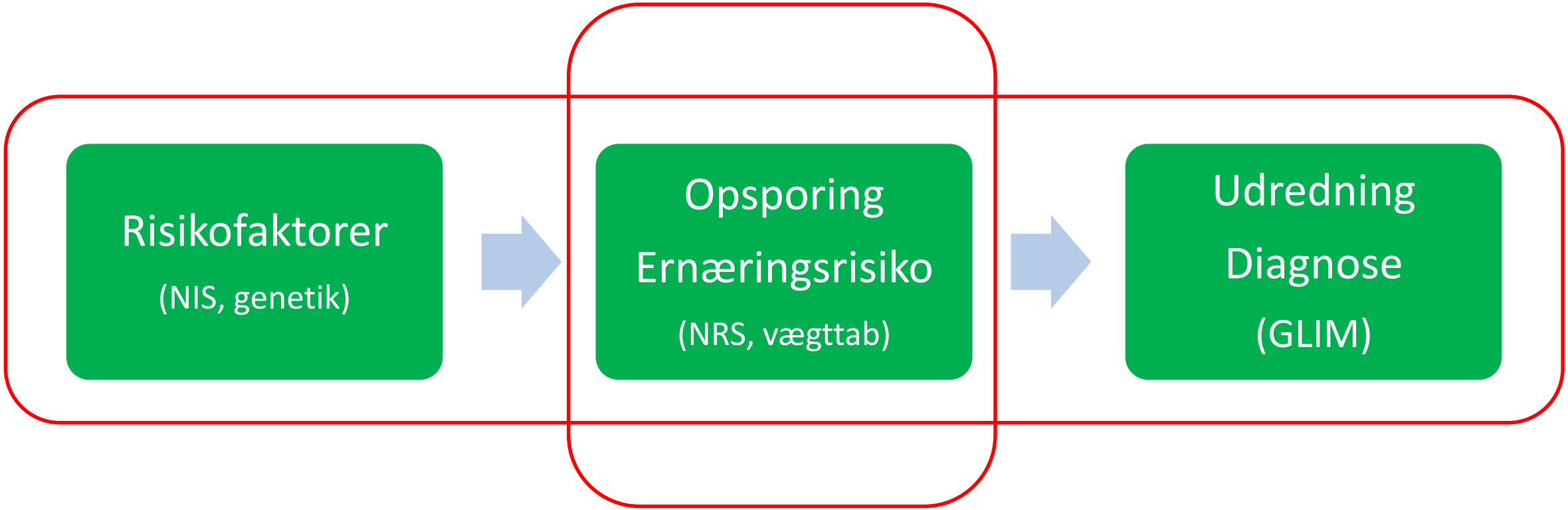
- Hvem er hyppigst i ernæringsrisiko og hvilke konsekvenser har det? Behandlingseffekt?
  - Hospital, indlagte
  - Hospital, ambulante
  - Almen praksis
  - Kommunale indsatser

HVAD ER DET?

- **'Underernæring' defineres** som en tilstand, der skyldes manglende eller utilstrækkeligt kostindtag i forhold til behovet eller i forhold til optagelsen af indtaget næring.

- **Medfører** vægttab, herunder reduceret muskelmasse, der igen fører til nedsat fysisk og mental funktion, øget risiko for komplikationer til medicinsk og kirurgisk behandling samt reduceret klinisk effekt af sygdomsbehandling

Sygdomsrelateret underernæring



Modifiable predictive factors and all-cause mortality in the non-hospitalized elderly population: An umbrella review of meta-analyses.

Yuan Y, Lin S, Lin W, Huang F, Zhu P.

Exp Gerontol. 2022

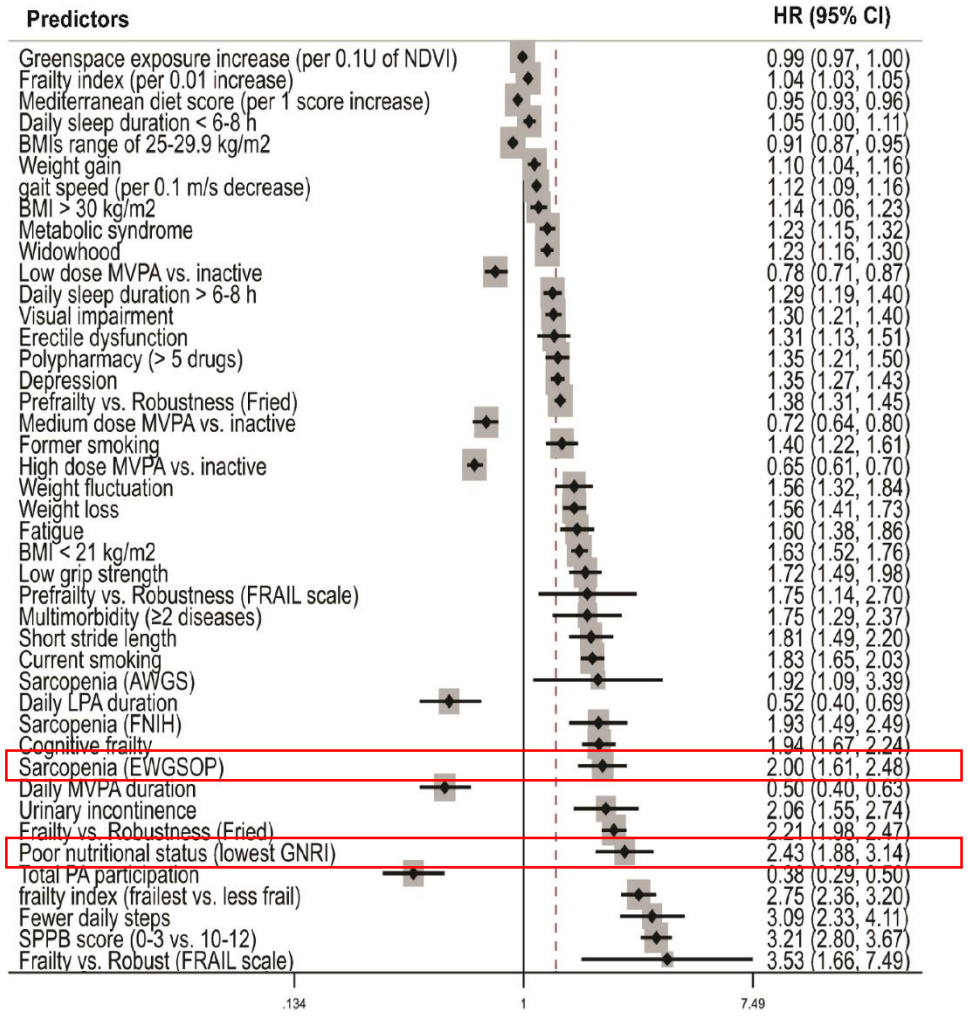
Risikofaktorer

(NIS, genetik)

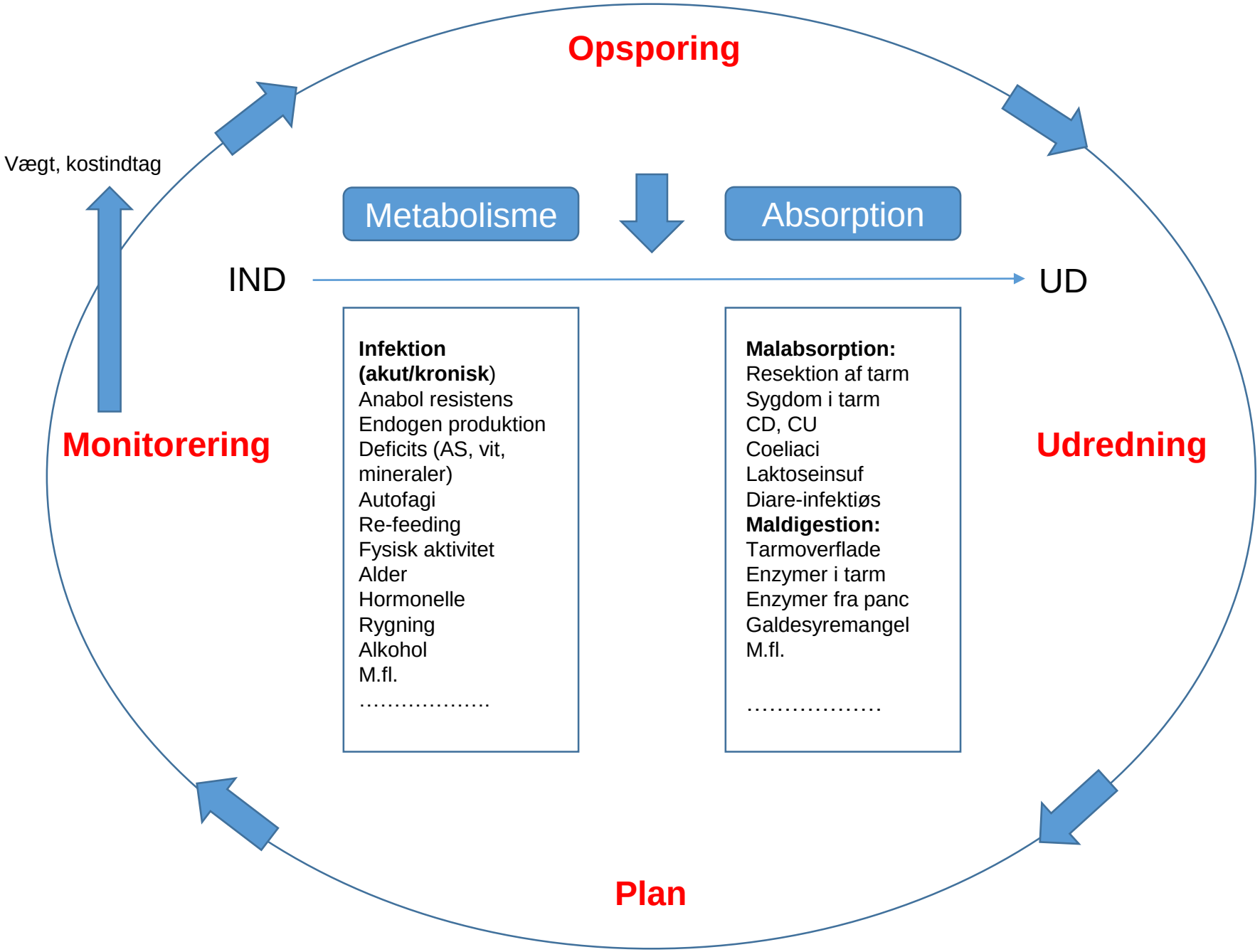
Vægttab →

Sarcopenia

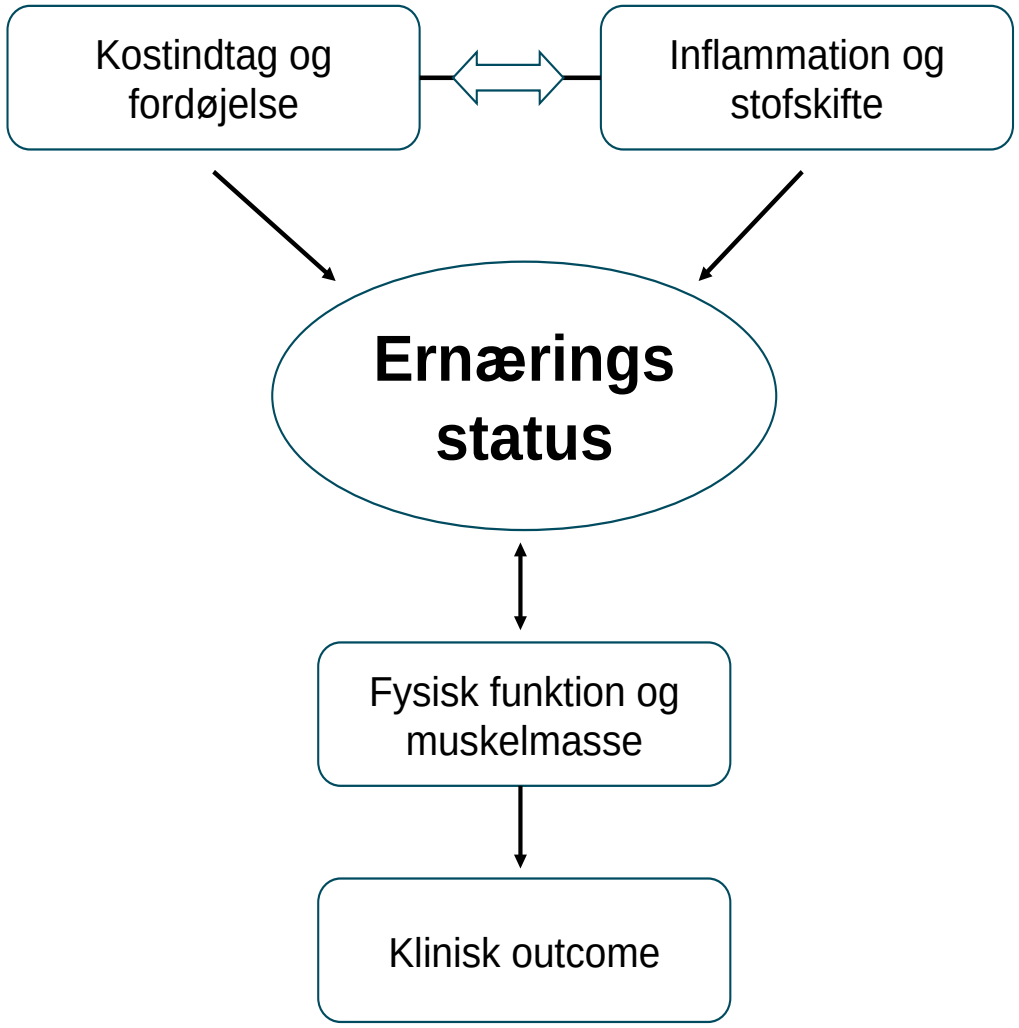
Malnutrition



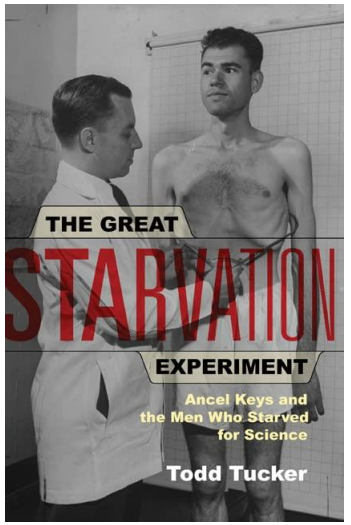
Top 10 list

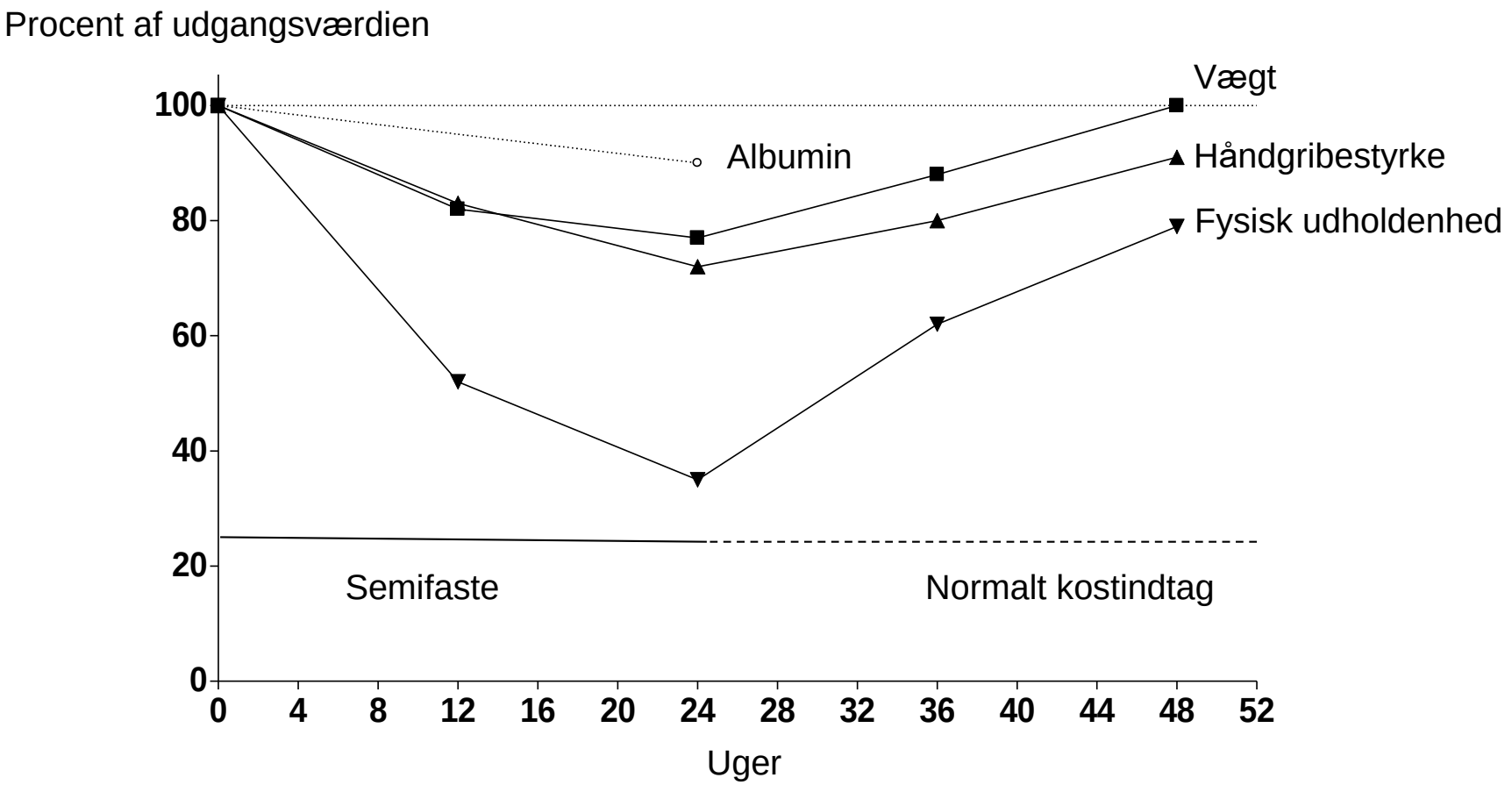

Opsporing
Vægt, kostindtag
Metabolisme
Absorption
IND
UD
Infektion (akut/kronisk)
Anabol resistens
Endogen produktion
Deficits (AS, vit, mineraler)
Autofagi
Re-feeding
Fysisk aktivitet
Alder
Hormonelle
Rygning
Alkohol
M.fl.
……..
Malabsorption:
Resektion af tarm
Sygdom i tarm
CD, CU
Coeliaci
Laktoseinsuf
Diare-infektiøs
Maldigestion:
Tarmoverflade
Enzymer i tarm
Enzymer fra panc
Galdesyremangel
M.fl.
……
Monitorering
Udredning
Plan

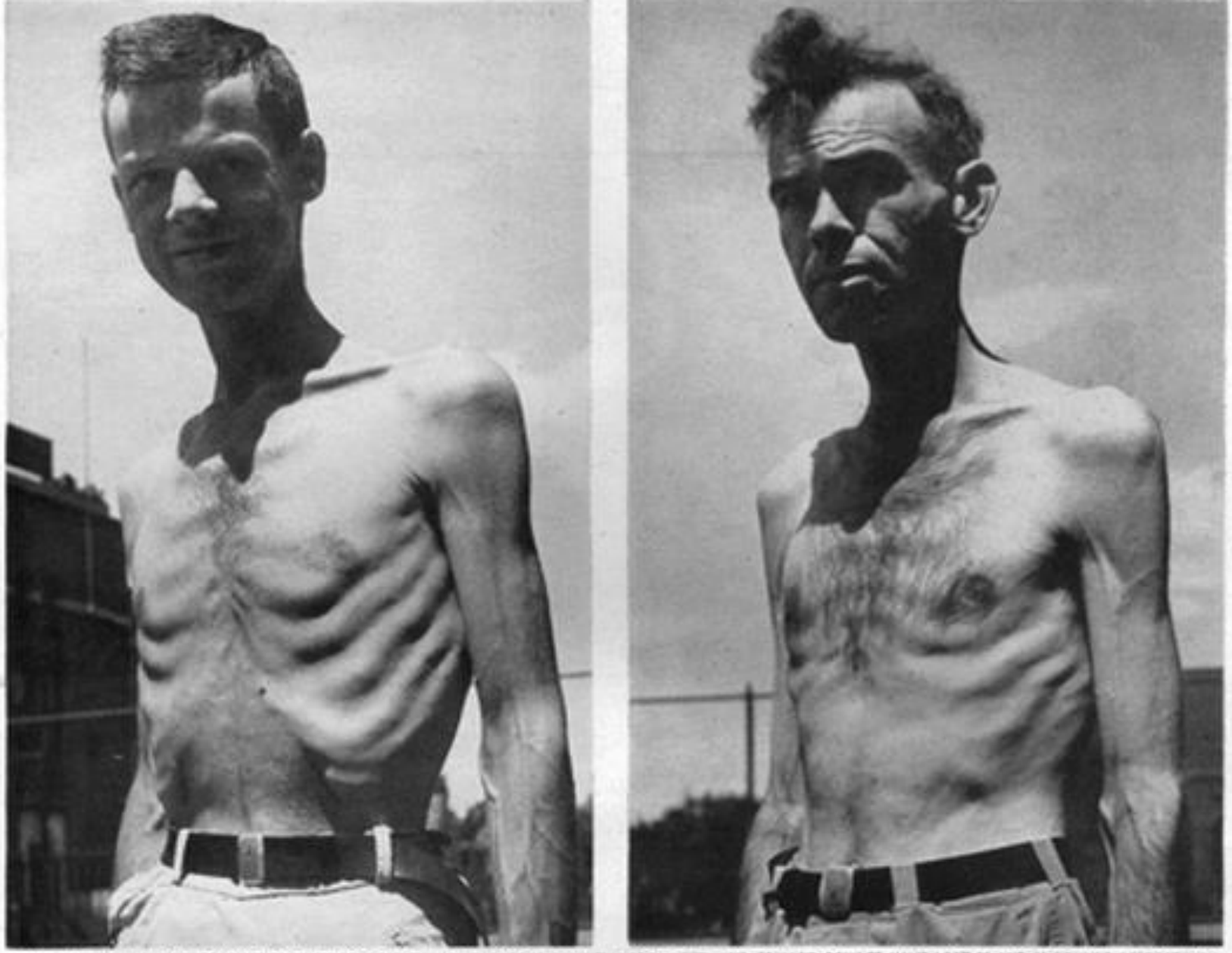
Undernæring: mekanismer



Betydningen af faste

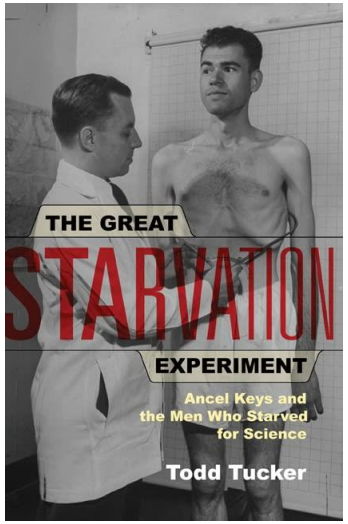






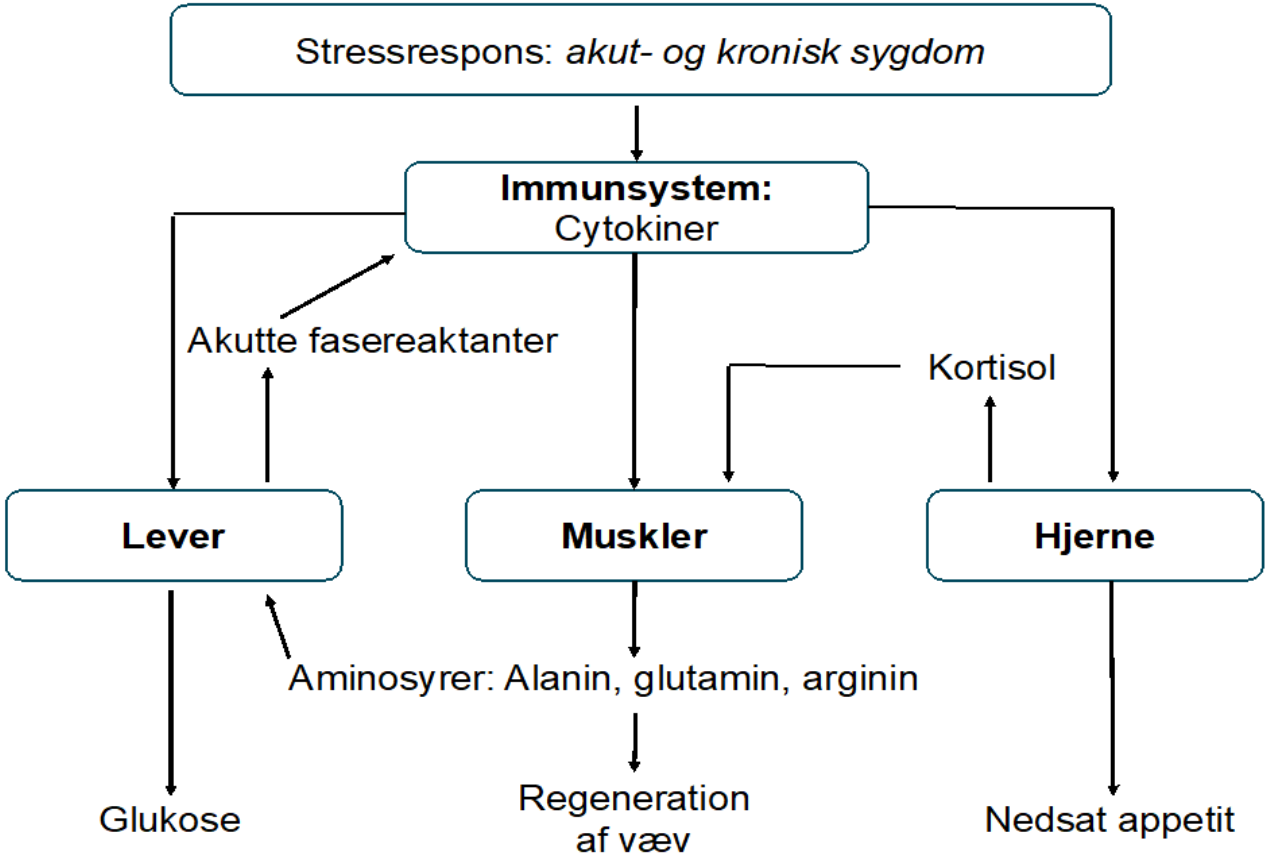
AFTER FIVE MONTHS OF STARVATION DIET CONSCIENTIOUS OBJECTORS SAMUEL LEGG (LEFT) AND EDWARD COWLES HAVE LOST 35 AND 30 POUNDS RESPECTIVELY

MEN STARVE IN MINNESOTA

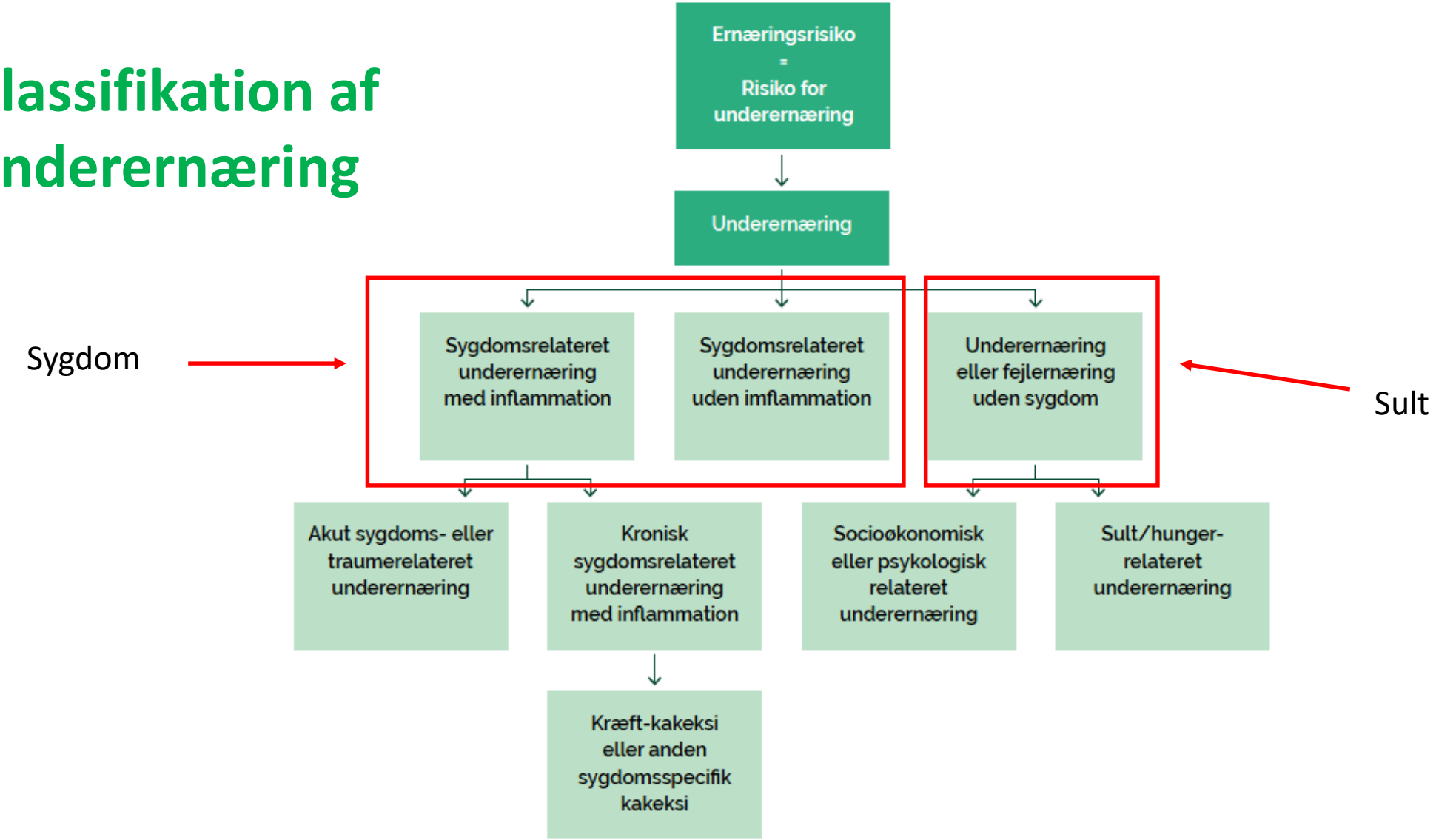


Keys A et al. JADA 1946

Betydningen af sygdom (f.eks. KOL, infektion)



Klassifikation af underernæring



Cederholm T et al. GLIM Core Leadership Committee; GLIM Working Group. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019 Feb;38(1):1-9.

Diagnosen underernæring

Opsporing af ernæringsrisiko		
Anvend et valideret redskab (NRS-2002 eller uplanlagt vægttab/EVS)		
Udredning af diagnosen underernæring		
Fænotypiske kriterier	Uplanlagt vægttab	> 5 % vægttab over 6 måneder eller > 10 % vægttab længere end 6 måneder tilbage
	Lavt BMI	< 20, hvis < 70 år eller < 22, hvis > 70 år Asiatisk etnicitet: < 18,5, hvis < 70 år eller < 20, hvis > 70 år
	Reduceret muskelmasse	Reduceret muskelmasse – målt med valideret metode for måling af kropssammensætningen[1]
Ætiologiske kriterier	Nedsat kostindtag eller nedsat optag af næringsstoffer	< 50 % af behovet < 1 uge Kronisk tilstand i mavetarmkanalen som påvirker absorption og optag af mad
	Inflammation[2]	Akut sygdom eller traume[3] Kronisk sygdom[4]
Diagnosen stilles		
Kriterier for at stille diagnosen underernæring	Kræver mindst 1 fænotypisk og 1 ætiologisk kriterie	

Cederholm T et al. GLIM Core Leadership Committee; GLIM Working Group. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019 Feb;38(1):1-9.

Screening and assessment tools

Table 1
Survey of existing approaches used in screening and assessment of malnutrition and cachexia.

	NRS-2002 [12] [a]	MNA-SF [21] [a,b]	MUST [22] [a]	ESPEN 2015 [8] [a]	ASPEN/AND [7] [a]	SGA [4] [a]	Evans 2008 [5] [c]	PEW 2008 [23] [d]	Fearon 2011 [6] [c]
Etiologies									
Reduced food intake	X	X	X	X	X	X		X	X
Disease burden/inflammation	X	X	X	X	X	X	X	X	X
Symptoms									
Anorexia		X				X	X		X
Weakness		X				X	X		
Signs/Phenotype									
Weight loss	X	X	X	X	X	X	X	X	X
Body mass index	X	X	X	X			X	X	X
Lean/fat free/muscle mass		X		X	X	X	X	X	X
Fat mass					X	X		X	
Fluid retention/ascites					X	X			
Muscle function; e.g. grip strength					X	X	X		
Biochemistry							X	X	

Hospital

Kommune

Cancer

Første skridt
før GLIM
diagnosen).....

Screening - opsporing

NRS 2002 – uplanlagt vægttab

Definition af et opsporings værktøj?

ASPEN-definition:
Ernæringsscreening defineres som "en proces til at identificere en person, der er underernæret, eller som er i fare for underernæring for at afgøre, om en detaljeret ernæringsvurdering er indiceret"

ESPEN definition:
Formålet med ernæringsscreening er at forudsige sandsynligheden for et bedre eller dårligere resultat på grund af ernæringsmæssige faktorer, og om ernæringsbehandling sandsynligvis vil påvirke dette (på et tidligt stadium).

GLIM definition:
At diagnosticere underernæring og klassificere dette for sværheds-grad. Ikke inkluderet effekt af ernæringsterapi!

Underernæring: En kombination mellem ernæringsstatus og sygdom som i NRS 2002

Ernæringsstatus
Kostindtag
Vægttab
BMI

Sygdom (metabolsk aktivitet)
Sværhedsgraden af sygdom

NRS 2002: hvem har effekt af ernæringsterapi?

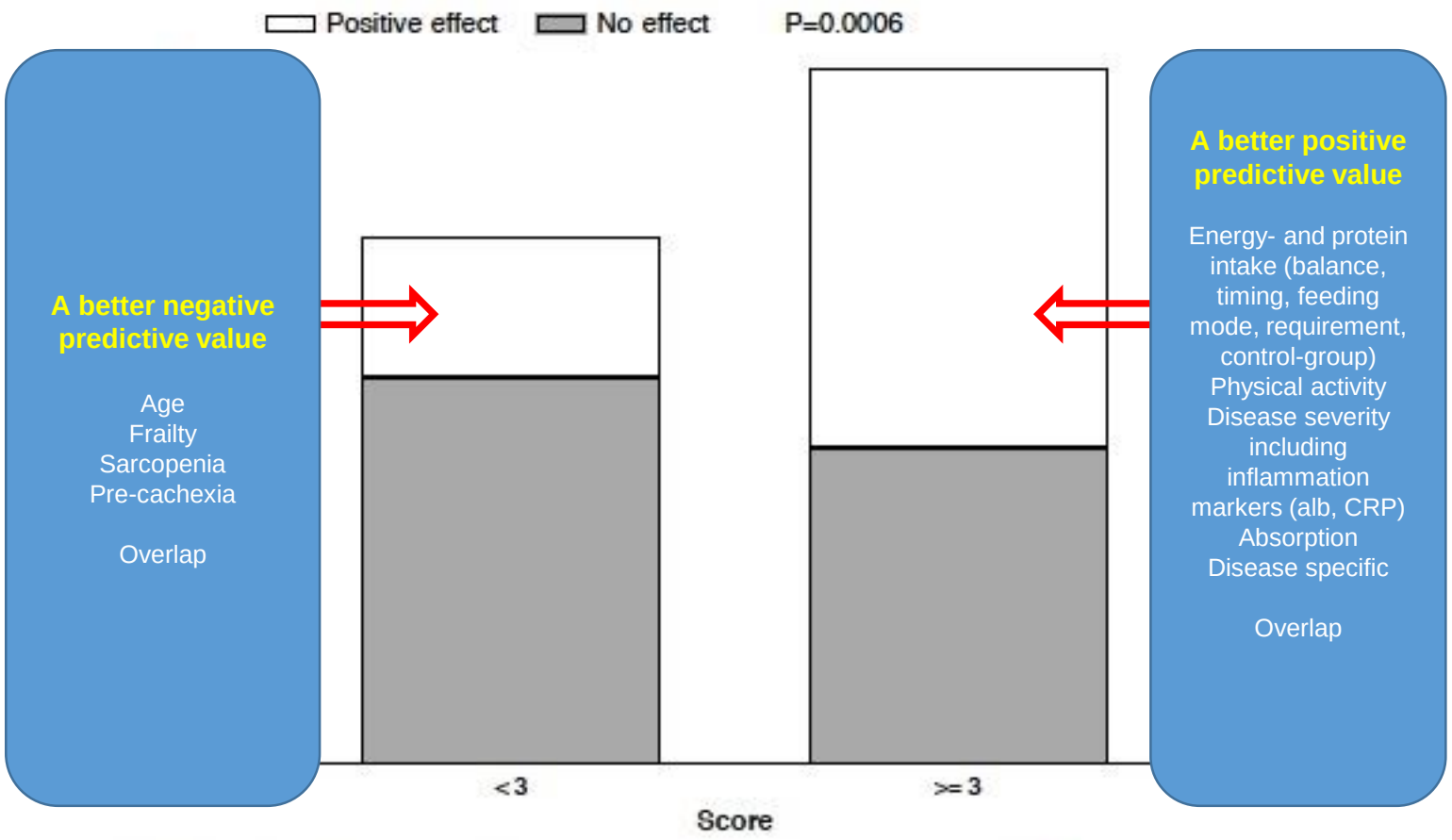


Fig. 1 Nutritional risk score and clinical outcome. All studies were classified according to nutritional risk of the patients studied, cf. Table 1, i.e. total score <3 or ≥ 3 and clinical outcome, i.e. a positive effect or no effect of nutritional support.

Kondrup et al. Clin Nutr 2003; 22: 321-336

Sygehus

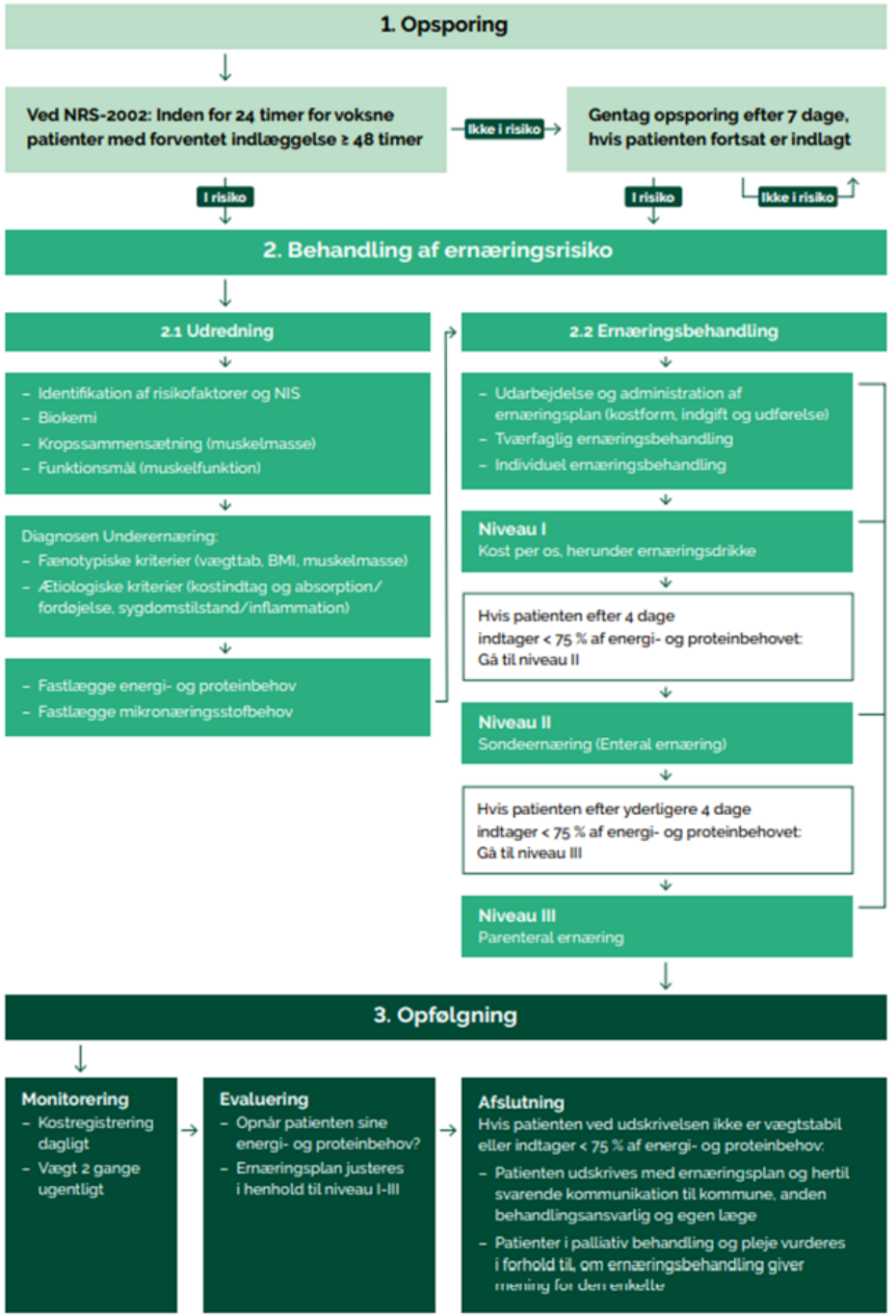
Opsporing

↓

Behandling

↓

Opfølgning



I ernæringsrisiko:

- Ernæringsplan
- Kommunikation til kommune og egen læge

Opsporing i primærsektoren – uplanlagt vægttab

dsam
Dansk Selskab for Almen Medicin

Nutrition. 2013 Jul-Aug;29(7-8):993-9.

Ability of different screening tools to predict positive effect on nutritional intervention among the elderly in primary health care.

Beck AM, Beermann T, Kjær S, Rasmussen HH.

U-planlagt vægttab + EVS til primærsektor

The ***aim***

- Mi
- The
- Nu
- Bo
- Eat

….usin ary health care, ose with a positiv

RESUL VS the highes

CONCLUSION: **Overall EVS seemed most capable** of distinguishing those clients and residents with a positive benefit from those that showed no benefit of nutritional intervention. The findings should be confirmed in further validation and intervention studies.

Kommunen

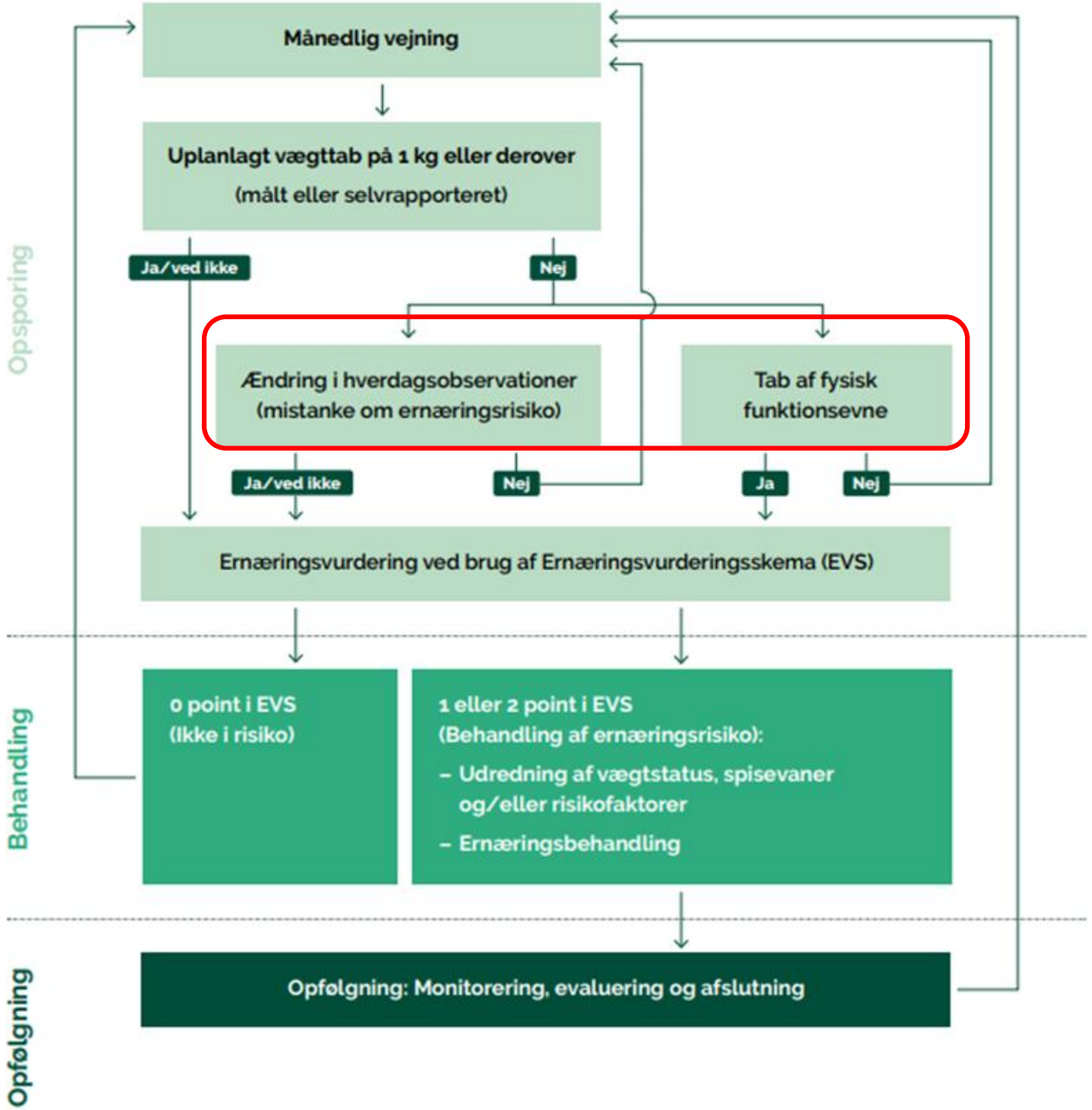
Opsporing

↓

Behandling

↓

Opfølgning



Almen praksis

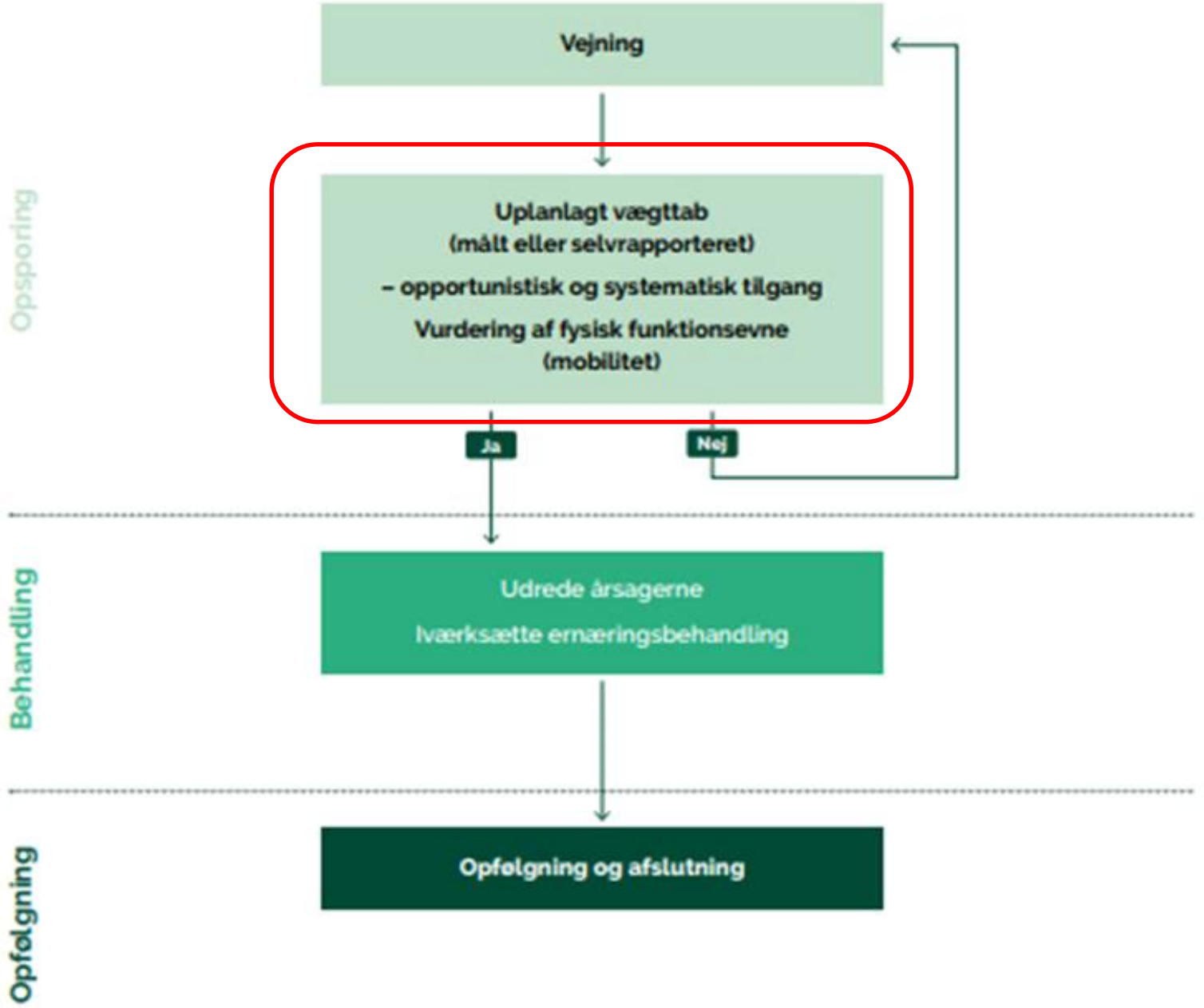
Opsporing

↓

Behandling

↓

Opfølgning



Indlagte patienter- opsporing med NRS-2002

ELSEVIER

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Original article

Nutritional risk is a predictor for long-term mortality: 5-Year follow-up of the EFFORT trial

Andriana Efthymiou [a, 1], Lara Hersberger [b, 1], Emilie Reber [a], Katja A. Schönenberger [c], Nina Kägi-Braun [d], Pascal Tribolet [d], Beat Mueller [d], Philipp Schuetz [b, *, 1], Zeno Stanga [a, 1], for the EFFORT study group

[a] Division of Diabetes, Endocrinology, Nutritional Medicine and Metabolism, Inselspital, Bern University Hospital, and University of Bern, Bern, Switzerland
[b] Medical University Department, Division of General Internal and Emergency Medicine, Kantonsspital Aarau, Aarau, Switzerland
[c] Inselspital, Bern, Switzerland
[d] Kantonsspital Aarau, Aarau, Switzerland

Nedsat overlevelse stigende med NRS-score

Alder, upl. Vægttab, total NRS-score, ko-morbiditeter bidrager til negative outcomes

318 efter 24 t, under indlæggelse

Patienter i ernæringsrisiko (n=169)	p-værdi	OR
Køn, kvinde	0.478	1.2 [0.8 ; 1.8]

Table 2
Associations between mortality and readmission regarding the two patient groups at nutritional risk and not at nutritional risk after one month follow-up.

Variable	Nutritional risk		p-value
	At risk	Not at risk	
Mortality, n (%)	N = 169	N = 149	0.005*
	16 (9.5)	3 (2.0)	
Readmissions, n (%)	N = 147	N = 142	0.334
0	114 (77.6)	119 (83.8)	
1	28 (19.1)	18 (12.7)	
2+	5 (3.4)	5 (3.5)	

*p < 0.05.

22,5%

16,2%

10% af kropsvægt			13.8 [4.1 ; 46.4]*

Mikkelsen et al. Clin Nutr ESP 54 og 57 2024

172 på 4 dag under indlæggelse

Table 3
Characteristics of patients at nutrition risk (score ≥3) and not at nutrition risk (score <3) according to NRS-2002.

Characteristics	At risk (score ≥3) n = 111	Not at risk (score <3) n = 61	p-value *
Age, years, median (IQR)	75 (67–81)	70 (63–82)	0.2406
Sex, n (%) female	56 (50)	32 (52)	0.8010
Cardiology, n (%)	3 (3)	2 (3)	
Gastro medical/surgical ward, n (%)	27 (24)	9 (15)	
General n			
n (%)			
Gynaecol			
Haematol			
Nephrolo			
Neurolog			
Oncology			
Orthopae			
Urology, n			
LOS in hospital at audit day, median (IQR)	10 (6–15)	8 (6–12)	0.1235
Weight, kg, median (IQR)	67 (57–80)	74 (63–87)	0.0152
Height, cm, median (IQR)	170 (163–178)	170 (164–176)	0.8370
BMI, median (IQR)	23 (20–26)	26 (23–29)	0.0004

LOS = length of stay, *) Wilcoxon test for continuous variables and CHI-squared or Fishers exact test for frequencies.

Kun lavere vægt og lavere BMI var associeret med risiko ved NRS-2002

Ko-morbiditet ikke medtaget

Beck et al. Clin Nutr ESP 41, 2021

Ambulante- opsporing med uplanlagt vægttab

713 ambulante 5 specialer: Uplanlagt vægttab

Variabel	Uplanlagt vægttab		Total n(%)	P-værdi	OR	95% CI
Køn	**Nej n(%)**	**Ja n(%)**				
Mand (ref.)	272 (74,93)	91 (25,07)	363 (100)	0,5443	1	
Kvinde	245 (72,92)	91 (27,08)	336 (100)		1,1102	(0,790;1,56)
Total	517	182	699			
Afdeling						
H (ref.)	167 (76,26)	52 (23,74)	219 (100)	0,8913	1	
M	124 (73,37)	45 (26,63)	169 (100)		1,165	(0,734;1,849)
I	18 (75)	6 (25)	24 (100)		1,071	(0,404;2,838)
A						34;1,849)
L						83;2,132)
Total						
Alder						
60-79 år (ref.)						
0-19 år						09;3,134)
20-39 år						58;1,682)
40-59 år						15;1,196)
80-99 år						96;4,358)
Total						
BMI						
Normalvægt (ref.)	226 (73,14)	83 (26,86)	309 (100)	0,0020*	1	
Undervægt	11 (40,74)	16 (59,26)	27 (100)		3,96*	(1,766;8,884)
Overvægt	171 (75,66)	55 (24,34)	226 (100)		0,876	(0,590;1,299)
Fedmeklasse 1	63 (79,75)	16 (20,25)	79 (100)			
Fedmeklasse 2	23 (82,14)	5 (17,86)	28 (100)			
Fedmeklasse 3	14 (82,35)	3 (17,65)	17 (100)			
Total	508	178	686			

Patienter over 80 år og
Patienter med BMI <18.5
havde *betydelig øget risiko* for uplanlagt vægttab

Patienter som kom til undersøgelse og udredning
havde *tendens* til øget risiko for uplanlagt vægttab

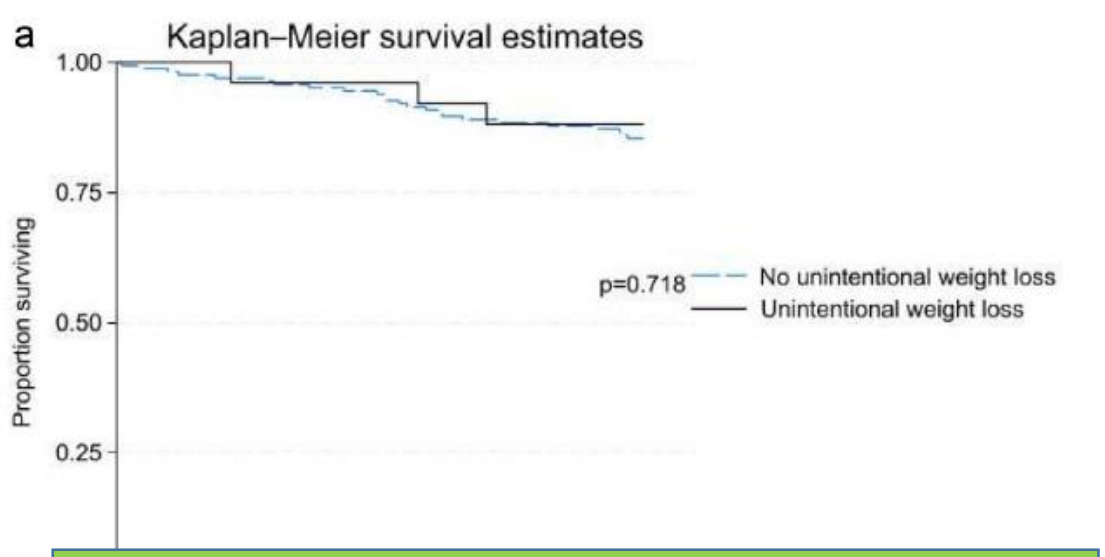
Mikkelsen S et al. Clinical Nutrition ESPEN, 2020
Jensen B.D et al. AM JOUR RES MED SCI, 2021 VOL 6,
Østergaard T et al. Am J Nur & Pract. 2019; 2(2):
Holst M et al. (2019) J Nurs Stud Patient Care, 1(1):
Holm M et al. Nutrition (2020)
Holst M et al. Int. Jour. Food Sci. and Nutr Res. 1002. (2019)

200 amb. KOL. Uplanlagt vægttab

Unintended weight loss (yes)		
	OR [95% CI]	p-value
Sex		0.963
Women	Reference	
Men	0.98 [0.50;1.94]	
Age		0.932
<60	0.96 [0.37;2.53]	
60-69	0.78 [0.34;1.80]	
70-79	Reference	
>79	1.03 [0.37;2.83]	
BMI		0.000*
Underweight <18.5	8.22 [2.77;24.38]*	
Normal weight 18.5-24.9	3.46 [1.31;9.13]*	
Pre-obesity 30.0-34.9	1.55 [0.51;4.75]	
Obesity >35	Reference	
GOLD Stage		0.656
Mild >80	1.5 [0.34;6.56]	
Moderate 50-80	1.0 [0.35;2.84]	
Severe 30-50	Reference	
Very severe <30	1.8 [0.63;5.12]	
Reduced food intake		0.003*
No	Reference	
Yes	3.15 [1.50;6.59]	
Nutrition impact symptoms		0.002*
No	Reference	
Yes	2.96 [1.47;5.95]	

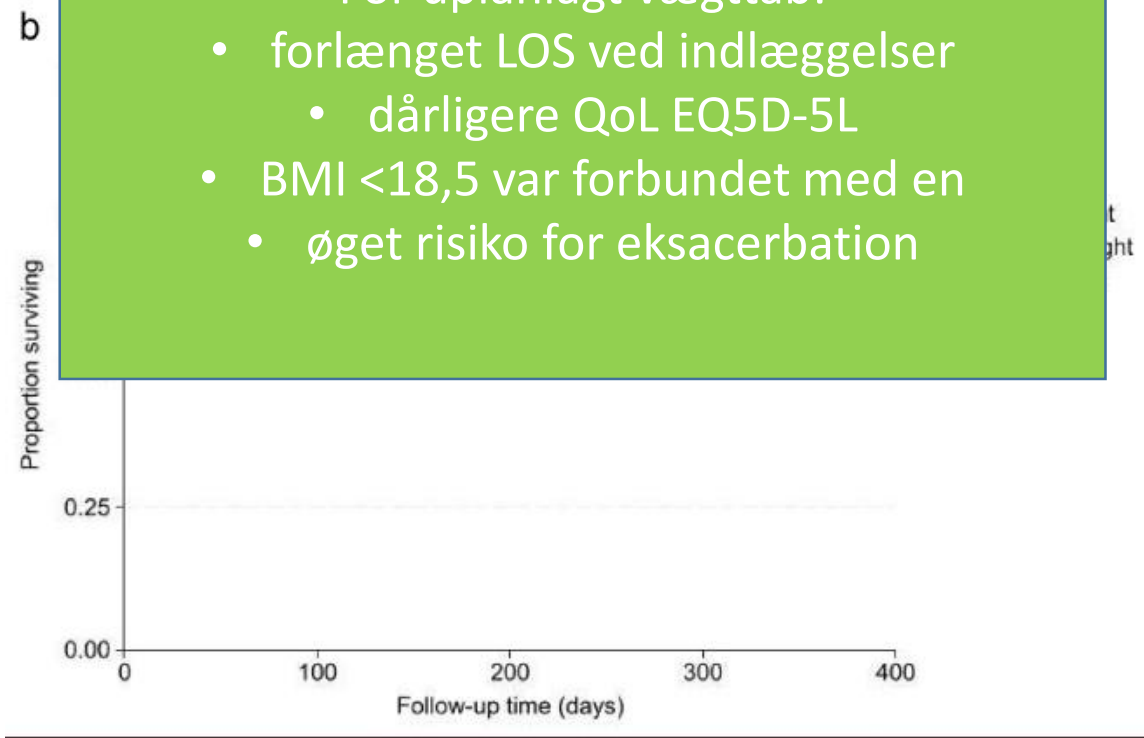
Table 5
Logistic regression and Cox hazard model regression of clinical outcomes. Odds ratios and hazard ratios are presented unadjusted in a crude analysis and adjusted for age, age and FEV1 as well as age, FEV1 and comorbidities.

	Unadjusted			Adjusted for age			Adjusted for age and FEV1			Adjusted for age, FEV1 and comorbidities		
	OR	95%CI	*p*	OR	95%CI	*p*	OR	95%CI	*p*	OR	95%CI	*p*
Hospital admission at 6 months												
Unintentional weight loss	1.86	0.80–4.36	0.151	1.93	0.82–4.56	0.132	1.61	0.63–4.13	0.321	1.39	0.52–3.66	0.511
Underweight	1.94	0.72–5.22	0.191	2.11	0.77–5.77	0.148	1.79	0.58–5.56	0.315	1.56	0.49–4.96	0.451
Obese	2.17	0.99–4.72	0.052	2.57	1.14–5.79	**0.022**	2.91	1.13–7.51	**0.027**	2.50	0.96–6.55	0.062
Hospital admission at 1-year follow-up												
Unintentional weight loss	2.29	0.94–5.60	0.070	2.41	0.98–6.00	0.057	2.07	0.79–5.42	0.139	1.88	0.71–5.01	0.205
Underweight	1.66	0.64–4.33	0.300	1.84	0.69–4.90	0.221	1.57	0.54–4.61	0.405	1.43	0.48–4.25	0.519
Obese	1.52	0.73–3.16	0.260	1.85	0.86–3.96	0.114	1.98	0.83–4.68	0.121	1.75	0.73–4.21	0.209
LOS (> 5 days) at 6-month follow-up (n = 23)												
Unintentional weight loss	3.55	1.29–9.78	**0.014**	3.63	1.31–10.06	**0.013**	4.95	1.63–15.02	**0.005**	4.52	1.46–13.97	**0.009**
Underweight	1.96	0.53–7.16	0.310	2.08	0.56–7.68	0.273	1.99	0.49–8.09	0.335	1.82	0.44–7.46	0.408
Obese	1.42	0.48–4.21	0.523	1.61	0.52–4.91	0.407	1.58	0.43–5.73	0.490	1.46	0.40–5.34	0.571
LOS (> 5 days) at 1-year follow-up (n = 35)												
Unintentional weight loss	2.94	1.18–7.37	**0.021**	3.03	1.20–7.65	**0.019**	3.97	1.44–10.94	**0.008**	3.41	1.20–9.68	**0.021**
Underweight	2.02	0.68–6.00	0.203	2.13	0.71–6.36	0.117	2.21	0.67–7.32	0.194	1.92	0.57-6-53	0.296
Obese	0.78	0.30–2.05	0.616	0.86	0.32–2.30	0.763	0.89	0.28–2.83	0.847	0.76	0.23–2.46	0.645
LOS (> 10 days) at 6-month follow-up (n = 8)												
Unintentional weight loss	2.26	0.43–11.88	0.335	2.21	0.42–11.68	0.349	2.27	0.33–15.52	0.403	2.01	0.28–14.31	0.485
Underweight	2.22	0.29–16.73	0.440	2.12	0.28–16.22	0.468	1.35	0.16–11.22	0.779	1.24	0.15–10.54	0.842
Obese	1.23	0.20–7.67	0.822	1.14	0.18–7.35	0.892	0.46	0.04–5.81	0.552	0.45	0.04–5.62	0.531
LOS (> 10 days) at 1-year follow-up (n = 12)												
Unintentional weight loss	2.32	0.58–9.22	0.233	2.35	0.58–9.39	0.225	3.43	0.78–15.10	0.103	3.06	0.68–13.85	0.146
Underweight	0.83	0.15–4.63	0.836	0.86	0.15–4.79	0.861	0.92	0.15–5.59	0.925	0.81	0.13–5.07	0.824
Obese	0.63	0.16–2.47	0.507	0.67	0.16–2.72	0.571	0.37	0.06–2.23	0.280	0.33	0.05–1.99	0.226
Exacerbation at 6-month follow-up (n = 62)												
Unintentional weight loss	1.43	0.57–3.61	0.445	1.58	0.62–4.05	0.341	1.10	0.39–3.13	0.858	1.08	0.38–3.09	0.890
Underweight	1.26	0.44–3.60	0.663	1.39	0.48–4.03	0.549	1.32	0.41–4.28	0.647	1.31	0.40–4.25	0.657
Obese	0.82	0.36–1.85	0.629	0.99	0.42–2.31	0.976	1.30	0.50–3.36	0.591	1.27	0.49-3-31	0.622
Exacerbation at 1-year follow-up (n = 78)												
Unintentional weight loss	1.74	0.65–4.66	0.268	1.82	0.68–4.90	0.236	1.26	0.42–3.82	0.684	1.12	0.36–3.45	0.848
Underweight	4.94	1.38–17.65	**0.014**	5.04	1.41–18.09	**0.013**	4.06	1.00–16.40	**0.049**	3.95	0.97–16.12	0.056
Obese	1.95	0.84–4.50	0.118	2.15	0.91–5.09	0.082	2.58	0.96–6.92	0.060	2.39	0.88–6.46	0.087
Mortality (n = 27)	**HR**	**95%CI**	***p***	**HR**	**95%CI**	***p***	**HR**	**95%CI**	***p***	**HR**	**95%CI**	***p***
Unintentional weight loss	0.80	0.24–2.66	0.718	0.84	0.25–2.79	0.773	1.00	0.29–3.45	0.999	0.96	0.28–3.32	0.947
Underweight	1.04	0.36–3.06	0.937	1.17	0.40–3.43	0.781	1.04	0.33–3.27	0.946	0.99	0.31–3.13	0.985
Obese	0.64	0.25–1.62	0.345	0.80	0.31–2.10	0.655	0.78	0.24–2.53	0.684	0.76	0.23–2.45	0.640



For uplanlagt vægttab:

- forlænget LOS ved indlæggelser
- dårligere QoL EQ5D-5L
- BMI <18,5 var forbundet med en
- øget risiko for eksacerbation



100 Amb lungefibrose- uplanlagt vægttab

Variable	Unintended weight loss		OR [CI 95%]	P-value
	Yes, N (%)	No, N (%)		

Table 3
The association between unintended weight loss at baseline and follow-up regarding mortality, hospital admission, and risk of sarcopenia

Variable	Unintended weight loss at baseline			
	OR (95% CI) (unadjusted)	*P* value	OR (95% CI) (adjusted)	*P* value
Dead (yes)	9.67 (0.56–168.04)	0.119	29.81 (1.22–728.00)	0.037*
Admission (yes)	6.99 (1.40 – 34.99)	0.018*	14.68 (1.94–110.68)	0.009*
	Unintended weight loss at follow-up			
	OR (95% CI) (unadjusted)	*P* value	OR (95% CI) (adjusted)	*P* value
Sarcopenia, SARC-F (≥ 4) (yes)	5.08 (1.41–18.23)	0.013*	4.00 (0.99–16.16)	0.052
Admissions (yes)	2.41 (0.70–8.30)	0.162	3.26 (0.61–17.44)	0.168
Unintended weight loss at baseline (yes)	0.94 (0.11–8.35)	0.952	0.43 (0.03–5.50)	0.515

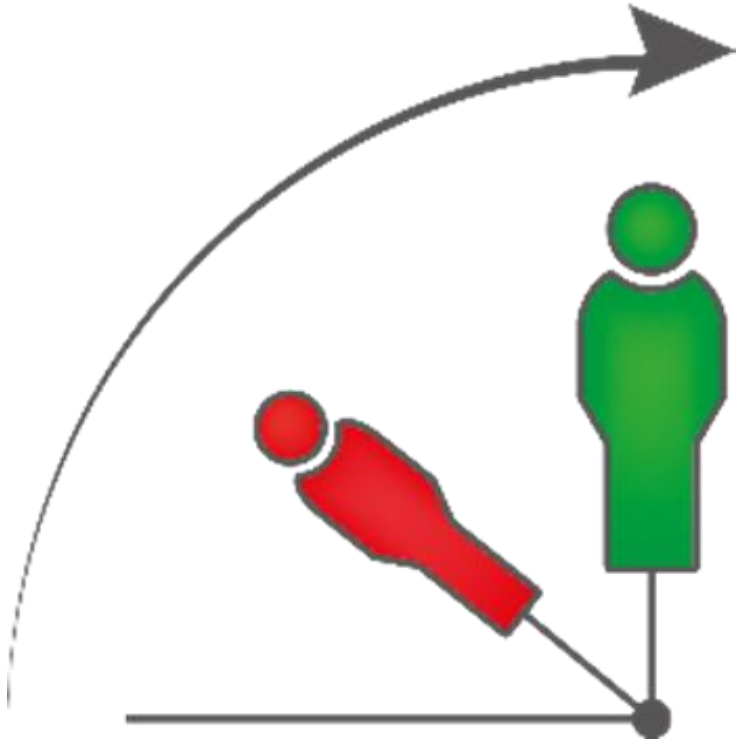
CI, confidence interval; OR, odds ratio; SARC-F, strength, assistance with walking, rising from a chair, climbing stairs, and falls questionnaire.
*$P < 0.05$.

No				0.001*
Yes				
Diagnose time, N=100				
0-2 years	15 (20.0)	60 (80.0)	Reference	0.549
>2 years	3 (12.0)	22 (88.0)	0.545 [0.14;2.07]	
Comorbidity, N=100				
No	5 (15.1)	28 (84.9)	Reference	0.603
Yes	13 (19.4)	54 (80.6)	1.348 [0.44;4.16]	
Smoking, N=69				
No	3 (20.0)	12 (80.0)	Reference	0.854
Yes	12 (22.2)	42 (77.8)	1.143 [0.28;4.72]	

Table 4: The association between unintended weight loss and the different exposures

Jensen B.D et al. AM JOUR RES MED SCI, 2021 VOL 6

Almen praksis- opsporing med uplanlagt vægttab



Almen praksis

	Population	Antal	% uplanlagt vægttab ≥ 2-3 mdr
Bjergby lægehus	Alle > 70 år	234	17.5% (2 Kg)
5 Nordjyske praksis	Alle	1087	14.2 (2Kg)

Mette Holst, Sabina Lund Mikkelsen, Mette Bolvig Poulsen
Underernæring forekommer hyppigt i almen praksis - på trods af gode visioner om opsporing og behandling

Jensen S A, et al. Nutritional impact symptoms evoking unintended weight loss among elderly patients in general practice. Int Clin Med Therp. 2018;1(1):2

Mikkelsen S et al. Malnutrition measured by unintended weight loss among patients in general practice. Nutrition. 2022 Apr;96:111554.

Almen praksis

Table 5
Association between unintended weight loss and sex, general practice, age, and BMI

Table 8
Association between reduced food intake and visit to general practice and reason for visit

Reduced food inta Variable = 1073			CI)†
Visit to general pr			
General practiti			
Nurse (yes)			
Other (yes)			
Reason for visit			
Follow-up on c			
Chronic pain (y			
Newly emerged			
Fatigue (yes)			
Mental discom			
Skin problems			
Suspicion of se			
New injury (ye			
Newly emerged			
General health			
Vaccination (ye			
Follow-up on n			
Other reasons‖			

The answer "yes" is
*$P < 0.05$.
†Adjusted for sex, age, BMI, and general practice.
§Insufficient data to calculate OR.
‖Other reasons: visits for prescription renewal, virus/flu symptoms, pregnancy examination, investigation of familial predisposition to disease, musculoskeletal disorders, follow up of old injury, medical certificate, and reasons unknown.BMI, body mass index; RFI, reduced food intake

*$P < 0.05$.
†BMI defined according to World Health Organization definition [44].

Øget forekomst af uplanlagt vægttab (14.2%; median vægttab 4 Kg) sås hos:

- Patienter <40 og >80
- Undervægtige
- Skal se læge og ikke sygeplejerske

Patienter, der besøger almen praksis på grund af:

- Kronisk smerte
- Mistænkt for en alvorlig sygdom
- Psykisk ubehag

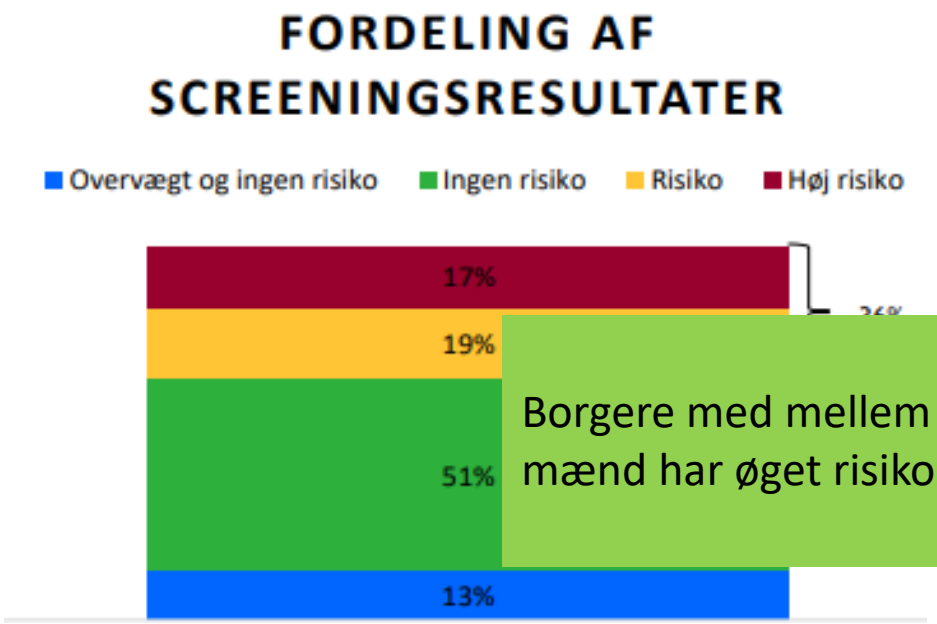
Kommune-uplanlagt vægttab

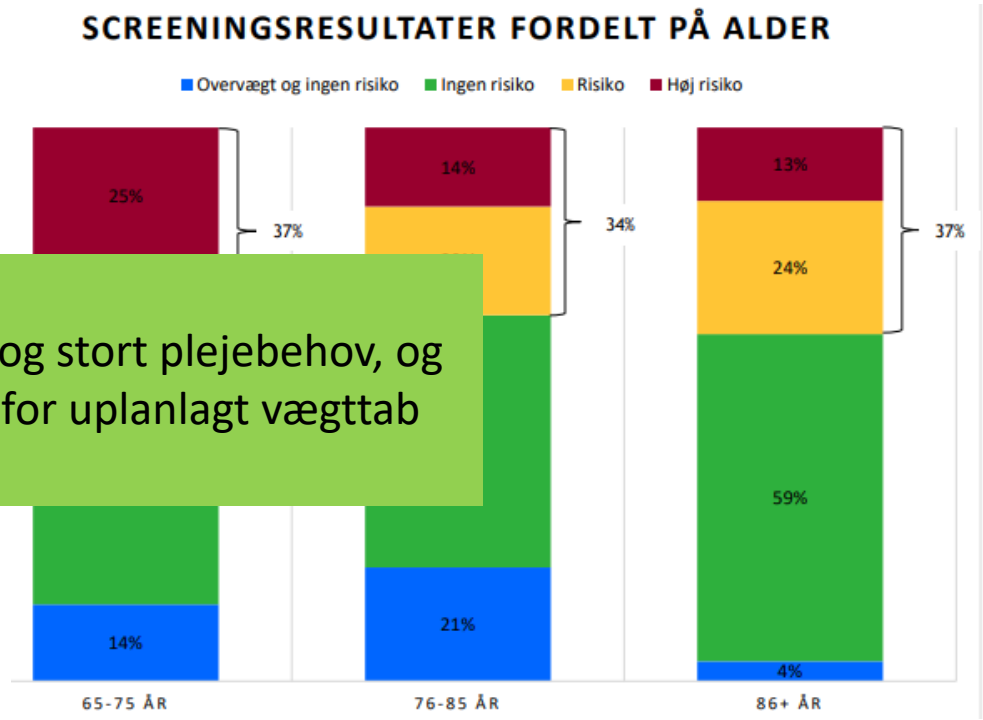
Ernæringsscreening på plejecentre	
Erfaringer fra pilotprojekt og fremtidig implementeringsmodel. Løvdalen og Humlehaven, Arresø Plejecenter. Halsnæs Kommune	
Population: Beboere på	N=110
Beboere i ernæringsrisiko ved EVS (uplanlagt vægttab), %	61 (68)
Antal beboere med 0 indsatsmål	48
Antal beboere med 1 indsatsmål	38
Antal beboere med mindst 2 indsatsmål	24
Antal beboere med 1 handleanvisning	35
Antal beboere med mindst 2 handleanvisninger	24
Beboere med tegn til dysfagi/ Ergoterapeut involveret	22/15
Beboere med dårlig tandstatus/ tandplejer involveret	16/9
Behov for hjælp til at spise / + ergoterapeut	37/20

Ernæringsscreening på plejecentrene Erfaringer fra pilotprojekt og fremtidig implementeringsmodel. Halsnæs kommune 2019.

Hjemmeplejen/ hjemmesygeplejen

Datagrundlag: 260 ernæringsscreeninger blandt borgere ≥ 65 år i Københavns Kommune, som modtager hjemmepleje eller hjemmesygepleje





Borgere med mellem og stort plejebehov, og mænd har øget risiko for uplanlagt vægttab

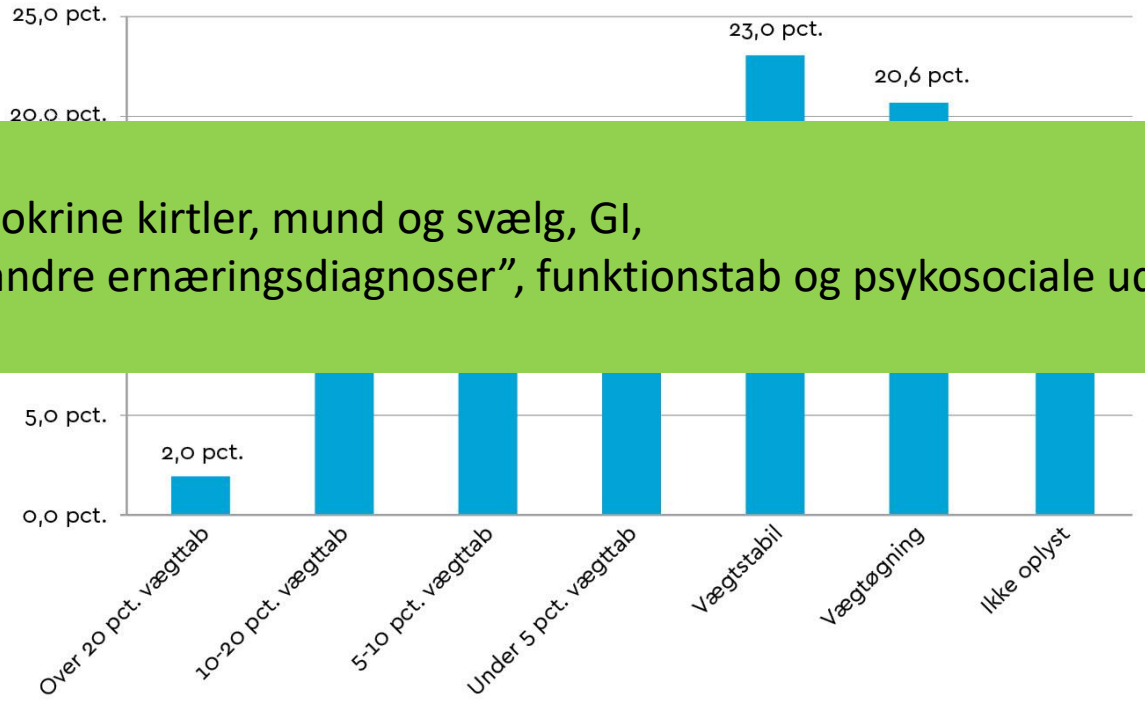
Total: 34-36%

ERNÆRINGSSCREENING AF BORGERE I HJEMMEPLEJEN/HJEMMESYGEPLEJEN Københavns Kommune Februar 2019

Kræft-Rehabilitering

Center for Kræft og Sundhed København (CKSK). 34 pct. af de borgere, som i 2018 deltog i et forløb i centeret, havde behov for diætvejledning

Figur 1. Vægtudvikling



Kræft endokrine kirtler, mund og svælg, GI,
og med ”andre ernæringsdiagnoser”, funktionstab og psykosociale udfordringer

Vægtudvikling over de sidste seks måneder ved forløbsstart for borgere, der påbegyndte rehabiliteringsforløb i CKSK i 2018. Andel i pct. (n=848).

Fag & Forskning 2021 ; (4): 62-69. Sygeplejefaglige artikler
Vibeke Sode , klinisk diætist, cand.scient.
Bell Møller , sygeplejerske

KOL Rehabilitering

KOL Rehabilitering i fem kommuner	% risiko	Andet
N= 79 Har haft uplanlagt vægttab siden de fik KOL-diagnosen, %	22	Behov for intervention
N= 98 Har haft uplanlagt vægttab siden de fik KOL-diagnosen, %	21	D. Intervention bedrer Proteinindtag som fastholdes e. 3 mdr
Har haft uplanlagt vægttab indenfor de seneste 3 måneder,%	15	

Birte Grønfeldt Jørgensen, et al.. Diætisten nr. 159. Juni 2019
Aadal L et al. J Neurosci Nurs. 2023 Apr 1;55
Beck A M et al. j.nutos.2023.10.006.
Holst M et al. Clin Nutr ESPEN. 2019

Opsummering- hvem der patienten/ borgeren i ernæringsrisiko

- Indlagte: Sygere, ældre, flere ko-morbiditeter, enker-enkemænd, Uplanlagt vægttab, lavt BMI
- Ambulante: Alder, lavere BMI, bor alene, ko-morbiditeter
- Almen praksis: Akut sydom (tid hos lægen) høj alder, lavt BMI, kroniske smerter, mistænker alvorlig sygdom, psykiske lidelser
- Kommune: Mænd, + mellem og stort plejebehov
- Rehabilitering: Kræft endokrine kirtler, mund og svælg, GI, og med ”andre ernæringsdiagnoser”, funktionstab og psykosociale udfordringer

Mørketal!!

- Hjemmepleje (ældre og syge der modtager hjælp i eget hjem)
- Sygeplejeklinikker
- Borgere der modtager behandling i eget hjem (i.e. Dialyse, kemoterapi, IV-antibiotika)
- Borgere i **aflastning** på plejehjem og på rehabiliteringsophold
- Overgange mellem sektorer uden specifikke indsatser
- Psykiatrien
- Boenheder for yngre handikappede og børn

Ny dansk litteratur til inspiration (2023)

Bech CB, Svendsen JA, Knudsen AW, Munk T, Beck AM. The association between malnutrition and dehydration in older adults admitted to a geriatric unit: An observational study. Clin Nutr ESPEN. 2023 Oct;57:598-605. doi: 10.1016/j.clnesp.2023.08.011. Epub 2023 Aug 12. PMID: 37739711.

Yde SK, Mikkelsen S, Brath MSG, Holst M. Unintentional weight loss is reflected in worse one-year clinical outcomes among COPD outpatients. Clin Nutr. 2023 Nov;42(11):2173-2180. doi: 10.1016/j.clnu.2023.09.012. Epub 2023 Sep 24. PMID: 37778301.

Landgrebe M, Tobberup R, Carus A, Rasmussen HH. GLIM diagnosed malnutrition predicts clinical outcomes and quality of life in patients with non-small cell lung cancer. Clin Nutr. 2023 Feb;42(2):190-198. doi: 10.1016/j.clnu.2022.12.011. Epub 2022 Dec 22. PMID: 36603459.

Aadal L, Holst M, Rasmussen HH, Nielsen JF, Odgaard L. Malnutrition in Patients With Moderate to Severe Acquired Brain Injury: Prevalence Durin... Weeks of Subacute Rehabilitation. J Neurosci Nurs. 2023 Apr 1;55(2)... doi: 10.1097/JNN.0000000000000688. Epub 2023 Feb 3. PMID...

Engelstrup E, Beck AM, Munk T, Bardal P, Knudsen AW... between nutrition impact symptoms, nutritional risk... survival in patients with head and neck cancer... Nutr ESPEN. 2023 Oct;57:239-245. doi: 10.1... ub 2023 Jun 29. PMID: 37739663.

Blondal BS, Geirsdottir OG, ... lisson PV, Ramel A. HOMEFOOD Randomi... Therapy in Discharged Older Adults Red... and Length of Stay at Hospital Up to 18 Mon... ith Aging. 2023;27(8):632-640. doi: 10.1007/s1260... 37702336.

Beck AM, Geisler ... L, Rasmussen HH, Jørgensen BG, BachDal C, Holst M, Optimizing individu... nts of pulmonary rehabilitation including a multifaceted dietary intervention – a single-arm feasibility study, Clinical Nutrition Open Science, https://doi.org/10.1016/ j.nutos.2023.10.006.

Borre M, Fassov J, Poulsen JL, Christensen P, Laurberg S, Drewes AM, Krogh K. Dietary Intervention Improves Gastrointestinal Symptoms after Treatment of Cancer in the Pelvic Organs. J Clin Med. 2023 Jul 19;12(14):4766. doi: 10.3390/jcm12144766. PMID: 37510881; PMCID:

Munk T, Tolstrup U, Beck AM, Holst M, Rasmussen HH, Hovhannisyan K, Thomsen T. Individualised dietary counselling for nutritionall... t-risk older patients following discharge from acute hospital to hom... ematic review and meta-analysis. J Hum Nutr Diet. 2016 Apr;29(... 10.1111/jhn.12307. Epub 2015 Mar 18. PMID...

Jespersen JB, Beck AM, Munk T, Je... ntake dehydration and nutrition impact... patients - A retrospective study. Clin N... 196. doi: 10.1016/j.clnesp.202... PMID: 37739655.

Nielsen RL, R... Appetite stimulation with cannabi... us for assessment of glomerular filtration in ... ness: A study protocol. Basic Clin Pharmacol ... 237-253. doi: 10.1111/bcpt.13914. Epub 2023 Jul 2.

... Tobberup R, Skadhauge LB, Rasmussen HH, Holst M. ...at" in patients at nutritional risk during hospital stay lowers the risk of ...e-month mortality. Clin Nutr ESPEN. 2023 Oct;57:29-38. doi: 10.1016/j.clnesp.2023.06.012. Epub 2023 Jun 19. PMID: 37739671.

Mikkelsen S, Frost KH, Engelbreth EM, Nilsson L, Peilicke KM, Tobberup R, Skadhauge LB, Rasmussen HH, Holst M. Are nutritional sufficiency of ≥75% energy and protein requirements relevant targets in patients at nutritional risk? - A one month follow-up study. Clin Nutr ESPEN. 2023 Apr;54:398-405. doi: 10.1016/j.clnesp.2023.02.007. Epub 2023 Feb 11. PMID: 36963885.

Holst M, Nielsen C, Sørensen LF, Ladefoged BT, Andersen SM, Thomsen SD, Mikkelsen SL. A 1-year follow-up study in patients with idiopathic pulmonary fibrosis regarding adverse outcomes to unintended weight loss. Nutrition. 2023 Apr;108:111964. doi: 10.1016/j.nut.2022.111964. Epub 2023 Jan 3. PMID: 36682268.

Melgaard D, Sørensen J, Riis J, et al. Efficacy of FODMAP Elimination and Subsequent Blinded Placebo-Controlled Provocations in a Randomised Controlled Study in Patients with Ulcerative Colitis in Remission and Symptoms of Irritable Bowel Syndrome: A Feasibility Study. Nutrients. 2022 Mar 18;14(6):1296. doi: 10.3390/nu14061296. PMID: 35334953; PMCID: PMC8955641.

Og der er meget mere

Tak fordi I lyttede

PROGRAM

16.00 Velkomst
Ines Raben, Klinisk Diætist, Cand. scient Medicinsk Afdeling, Sjælland Universitets Hospital Køge og Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

16.10 Patienten i ernæringsrisiko
Mette Holst, Professor, Ph.D., og Henrik Højgaard Rasmussen, Overlæge, Professor, Center for Ernæring og Tarmsvigt, Aalborg Universitets Hospital

16.40 Ernæring til den kritisk syge patient – opdaterede guidelines
Jørgen Wiis, Overlæge, EDIC, Afdeling for Intensiv behandling 4131, Center for kræft og organsygdomme, Rigshospitalet

17.10 Pause

Nye store internationale guidelines

CLINICAL GUIDELINES

2021

Guidelines for the provision of nutrition support therapy in the adult critically ill patient: The American Society for Parenteral and Enteral Nutrition

Charlene Compher PhD, RD[1] | Angela L. Bingham PharmD[2,3] | Michele McCall MSc, RD[4] | Jayshil Patel MD[5] | Todd W. Rice MD, MSc[6] | Carol Braunschweig PhD[7] | Liam McKeever PhD, RDN[7]

[1] Biobehavioral Health Sciences Department, School of Nursing, University of Pennsylvania, Philadelphia, Pennsylvania, USA

[2] Department of Pharmacy, Cooper University Hospital, Camden, New Jersey, USA

[3] Department of Pharmacy Practice and Pharmacy Administration, Philadelphia College of Pharmacy, University of the Sciences, Philadelphia, Pennsylvania, USA

[4] St. Michael's Hospital, Medical/Surgical Intensive Care Unit, Toronto, Ontario, Canada

[5] Division of Pulmonary and Critical Care Medicine, Medical College of Wisconsin, Milwaukee, Wisconsin, USA

[6] Division of Allergy, Pulmonary, and Critical Care Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee, USA

[7] Division of Epidemiology and Biostatistics, Department of Kinesiology and Nutrition, University of Illinois, Chicago, Illinois, USA

Correspondence
Liam McKeever, PhD, RDN, ASPEN Clinical Guidelines Director and Editor-in-Chief, Department of Kinesiology and Nutrition, University of Illinois at Chicago, Applied Health Sciences BLDG, Room 650, Chicago, IL 60612, USA.
Email: wmckee2@uic.edu

This and other *JPEN* podcasts are available at https://nutritioncare.org/podcasts

Abstract

Background: This guideline updates recommendations from the 2016 American Society for Parenteral and Enteral Nutrition (ASPEN)/Society of Critical Care Medicine (SCCM) critical care nutrition guideline for five foundational questions central to critical care nutrition support.

Methods: The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) process was used to develop and summarize evidence for clinical practice recommendations. Clinical outcomes were assessed for (1) higher vs lower energy dose, (2) higher vs lower protein dose, (3) exclusive isocaloric parenteral nutrition (PN) vs enteral nutrition (EN), (4) supplemental PN (SPN) plus EN vs EN alone, (5A) mixed-oil lipid injectable emulsions (ILEs) vs soybean oil, and (5B) fish oil (FO)–containing ILE vs non-FO ILE. To assess safety, weight-based energy intake and protein were plotted against hospital mortality.

Results: Between January 1, 2001, and July 15, 2020, 2320 citations were identified and data were abstracted from 36 trials including 20,578 participants. Patients receiving FO had decreased pneumonia rates of uncertain clinical significance. Otherwise, there were no differences for any outcome in any question. Owing to a lack of certainty regarding harm, the energy prescription recommendation was decreased to 12–25 kcal/kg/day.

Conclusion: No differences in clinical outcomes were identified among numerous nutrition interventions, including higher energy or protein intake, isocaloric PN or EN, SPN, or different ILEs. As more consistent critical care nutrition support data become available, more precise recommendations will be possible. In the meantime, clinical judgment and close monitoring are needed. This paper was approved by the ASPEN Board of Directors.

2023

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

ESPEN Guideline

ESPEN practical and partially revised guideline: Clinical nutrition in the intensive care unit

Pierre Singer [a, *], Annika Reintam Blaser [b, c], Mette M. Berger [d], Philip C. Calder [e], Michael Casaer [f], Michael Hiesmayr [g], Konstantin Mayer [h], Juan Carlos Montejo-Gonzalez [i], Claude Pichard [j], Jean-Charles Preiser [k], Wojciech Szczeklik [l], Arthur R.H. van Zanten [m], Stephan C. Bischoff [n]

Intensive Care Unit, Herzlia Medical Center and Department of General Intensive Care and Institute for Nutrition Research, Rabin Medical Center, Beilinson Hospital, Sackler School of Medicine, Tel Aviv University, Tel Aviv, and Intensive Care Unit, Herzlia Medical Center, Israel
Department of Anaesthesiology and Intensive Care, University of Tartu, Tartu, Estonia
Department of Intensive Care Medicine, Lucerne Cantonal Hospital, Lucerne, Switzerland
Faculty of Biology and Medicine, Lausanne University Hospital, Lausanne, Switzerland
School of Human Development and Health, Faculty of Medicine, University of Southampton and NIHR Southampton Biomedical Research Centre, University Hospital Southampton NHS Foundation Trust and University of Southampton, Southampton, United Kingdom
Clinical Department and Laboratory of Intensive Care Medicine, Catholic University Hospitals (UZLeuven) and Catholic University Leuven, Leuven, Belgium
Division Cardiac-, Thoracic-, Vascular Anaesthesia and Intensive Care, Medical University Vienna, Vienna, Austria
Department of Pneumonology, Infectious Diseases and Sleep Medicine, St. Vincentius Kliniken gAG, Karlsruhe, Germany
Instituto de Investigación Sanitaria "imas12" Hospital Universitario 12 de Octubre, Madrid, Spain
Department of Clinical Nutrition, Geneva University Hospital, Geneva, Switzerland
Medical Direction, Hopital Universitaire de Bruxelles, Erasme Hospital, Université Libre de Bruxelles, Brussels, Belgium
Centre for Intensive Care and Perioperative Medicine, Jagiellonian University Medical College & Anesthesia and Intensive Care Department, 5th Military Hospital, Krakow, Poland
[s] Department of Intensive Care, Gelderse Vallei Hospital, Ede, The Netherlands & Wageningen University & Research, Wageningen, the Netherlands
Department of Nutritional Medicine/Prevention, University of Hohenheim, Stuttgart, Germany

ARTICLE INFO

Article history:
Received 8 June 2023
Accepted 10 July 2023

Keywords:
Intensive care
Nutrition
Enteral
Parenteral
Guidelines
Recommendations
ESPEN

SUMMARY

Following the new ESPEN Standard Operating Procedures, the previous 2019 guideline to provide best medical nutritional therapy to critically ill patients has been shortened and partially revised. Following this update, we propose this publication as a practical guideline based on the published scientific guideline, but shortened and illustrated by flow charts. The main goal of this practical guideline is to increase understanding and allow the practitioner to implement the Nutrition in the ICU guidelines. All the items discussed in the previous guidelines are included as well as special conditions.

1. Introduction

The European Society for Clinical Nutrition and Metabolism (ESPEN) has published guidelines on nutrition in the intensive care unit (ICU) in 2006 (enteral nutrition (EN)) and 2009 parenteral nutrition (PN)) [1,2]. Since then, the ESPEN methodology has been upgraded to the "S3 guidelines level" described elsewhere [3] resulting in rigorous evidence-based and consensus-based recommendations that were published in 2019 [4]. The present guideline is a shortening and a partial revision of the previous guideline. The determination of the effect of nutrition alone on any possible outcome is complicated by the fact that the severity of illness and the number of comorbidities encountered among adult ICU patients is increasing [5]. Furthermore, the large heterogeneity of the ICU population potentially reduces the external validity of the recommendations,

* Corresponding author.
E-mail address: Pierre.singer@gmail.com (P. Singer).

https://doi.org/10.1016/j.clnu.2023.07.011
0261-5614/

ERNÆRING TIL KRITISK SYGE

DASAIM

Udarbejdet af:
Jørgen Wiis, Overlæge, Intensiv Terapi Klinik 4131, Rigshospitalet
Lise Skyttegaard Balkert, Afdelingslæge, NIA Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Meike Tomesch Behzadi, Overlæge, Thorax Intensiv Afsnit TIA, Aalborg Universitetshospital
Camilla Rødbro Dalgaard, Afdelingslæge, Thorax anæstesi og intensiv, Aalborg Universitetshospital
Pernille Haure, Overlæge, Neurointensivt Afsnit NOTIA, Aalborg Universitetshospital
Dorte Illum, Overlæge, Intensiv Afdeling ITA, Aarhus Universitetshospital
Margrethe Jermiin Jensen, Afdelingslæge, VITA/BTY Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Pia Lawson-Smith, Overlæge, Afdelingen for bedøvelse og intensiv behandling, Neurocentret, Rigshospitalet
Jens Michelsen, Overlæge, ITA Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Ulrik Skram, Overlæge, Intensiv Afdeling, Nordsjællands Hospital

National behandlingsvejledning 2024

Clinical Nutrition 42 (2023) 1671–1689

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

ESPEN Guideline

ESPEN practical and partially revised guideline: Clinical nutrition in the intensive care unit

Pierre Singer [a, *], Annika Reintam Blaser [b, c], Mette M. Berger [d], Philip C. Calder [e], Michael Casaer [f], Michael Hiesmayr [g], Konstantin Mayer [h], Juan Carlos Montejo-Gonzalez [i], Claude Pichard [j], Jean-Charles Preiser [k], Wojciech Szczeklik [l], Arthur R.H. van Zanten [m], Stephan C. Bischoff [n]

[a] Intensive Care Unit, Herzlia Medical Center and Department of General Intensive Care and Institute for Nutrition Research, Rabin Medical Center, Beilinson Hospital, Sackler School of Medicine, Tel Aviv University, Tel Aviv, and Intensive Care Unit, Herzlia Medical Center, Israel
[b] Department of Anaesthesiology and Intensive Care, University of Tartu, Tartu, Estonia
[c] Department of Intensive Care Medicine, Lucerne Cantonal Hospital, Lucerne, Switzerland
[d] Faculty of Biology and Medicine, Lausanne University Hospital, Lausanne, Switzerland
[e] School of Human Development and Health, Faculty of Medicine, University of Southampton and NIHR Southampton Biomedical Research Centre, University Hospital Southampton NHS Foundation Trust and University of Southampton, Southampton, United Kingdom
[f] Clinical Department and Laboratory of Intensive Care Medicine, Catholic University Hospitals (UZLeuven) and Catholic University Leuven, Leuven, Belgium
[g] Division Cardiac-, Thoracic-, Vascular Anaesthesia and Intensive Care, Medical University Vienna, Vienna, Austria
[h] Department of Pneumonology, Infectious Diseases and Sleep Medicine, St. Vincentius Kliniken gAG, Karlsruhe, Germany
[i] Instituto de Investigación Sanitaria "imas12" Hospital Universitario 12 de Octubre, Madrid, Spain
[j] Department of Clinical Nutrition, Geneva University Hospital, Geneva, Switzerland
[k] Medical Direction, Hopital Universitaire de Bruxelles, Erasme Hospital, Université Libre de Bruxelles, Brussels, Belgium
[l] Centre for Intensive Care and Perioperative Medicine, Jagiellonian University Medical College & Anesthesia and Intensive Care Department, 5th Military Hospital, Krakow, Poland
[m] Department of Intensive Care, Gelderse Vallei Hospital, Ede, The Netherlands & Wageningen University & Research, Wageningen, the Netherlands
[n] Department of Nutritional Medicine/Prevention, University of Hohenheim, Stuttgart, Germany

ARTICLE INFO

Article history:
Received 8 June 2023
Accepted 10 July 2023

Keywords:
Intensive care
Nutrition
Enteral
Parenteral
Guidelines
Recommendations
ESPEN

SUMMARY

Following the new ESPEN Standard Operating Procedures, the previous 2019 guideline to provide best medical nutritional therapy to critically ill patients has been shortened and partially revised. Following this update, we propose this publication as a practical guideline based on the published scientific guideline, but shortened and illustrated by flow charts. The main goal of this practical guideline is to increase understanding and allow the practitioner to implement the Nutrition in the ICU guidelines. All the items discussed in the previous guidelines are included as well as special conditions.

1. Introduction

The European Society for Clinical Nutrition and Metabolism (ESPEN) has published guidelines on nutrition in the intensive care unit (ICU) in 2006 (enteral nutrition (EN)) and 2009 (parenteral nutrition (PN)) [1,2]. Since then, the ESPEN methodology has been upgraded to the "S3 guidelines level" described elsewhere [3] resulting in rigorous evidence-based and consensus-based recommendations that were published in 2019 [4]. The present guideline is a shortening and a partial revision of the previous guideline. The determination of the effect of nutrition alone on any possible outcome is complicated by the fact that the severity of illness and the number of comorbidities encountered among adult ICU patients is increasing [5]. Furthermore, the large heterogeneity of the ICU population potentially reduces the external validity of the recommendations,

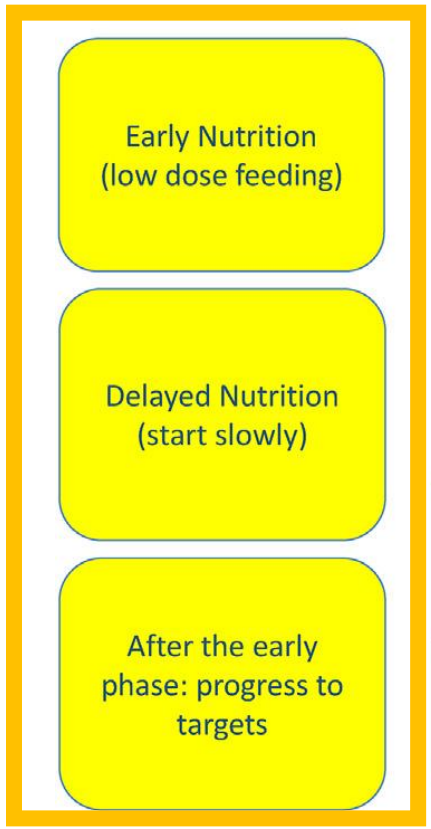
ding author.
ddress: Pierre.singer@gmail.com (P. Singer).

https://doi.org/10.1016/j.clnu.2023.07.011
0261-5614/

AT få det til at fungere

Indholdsfortegnelse

ESPEN algoritmer 2023

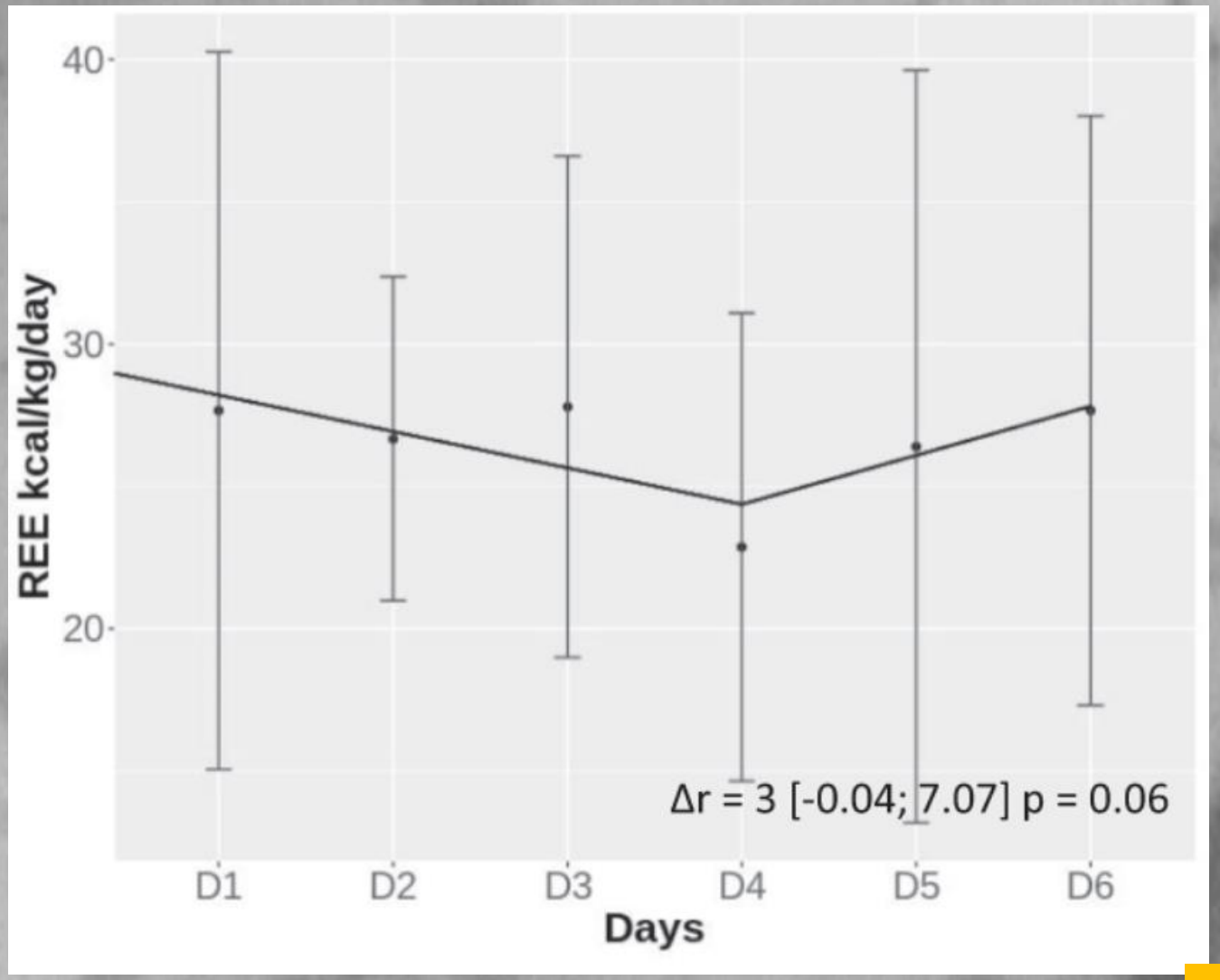


ERNÆRINGSTILSTAND VS SYGDOMSFASE

Nutritional state

Critical care nutrition

”Sepsis er en hypermetabolisk tilstand?”



Dynamic metabolic changes measured by indirect calorimetry during the early phase of septic shock: a prospective observational pilot study

Emilie Occhiali[1✉], Maximilien Urfi[2], Thibaut Pressat-Laffouilhère[3], Najate Achamrah[4], Benoit Veber[1] and Thomas Clavier[1]

nature.com/ejcn Oct 2021

En for alle

25 kcal/kg
1,2 g/kg

Undgå overfodring

CLINICAL GUIDELINES

Guidelines for the provision of nutrition support therapy in the adult critically ill patient: The American Society for Parenteral and Enteral Nutrition

Charlene Compher PhD, RD[1] | Angela L. Bingham PharmD[2,3] | Michele McCall MSc, RD[2] | Jayshil Patel MD[3] | Todd W. Rice MD, MSc[4] | Carol Braunschweig PhD[5] | Lian McKeever PhD, RDN[6]

Abstract

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

ESPEN Guideline

ESPEN practical and partially revised guideline: Clinical nutrition in the intensive care unit

Pierre Singer [a,*], Annika Reintam Blaser [b,c], Mette M. Berger [d], Philip C. Calder [e], Michael Casaer [f], Michael Hiesmayr [g], Konstantin Mayer [h], Juan Carlos Montejo-Gonzalez [i], Claude Pichard [j], Jean-Charles Preiser [k], Wojciech Szczeklik [l], Arthur R.H. van Zanten [m], Stephan C. Bischoff [n]

ARTICLE INFO

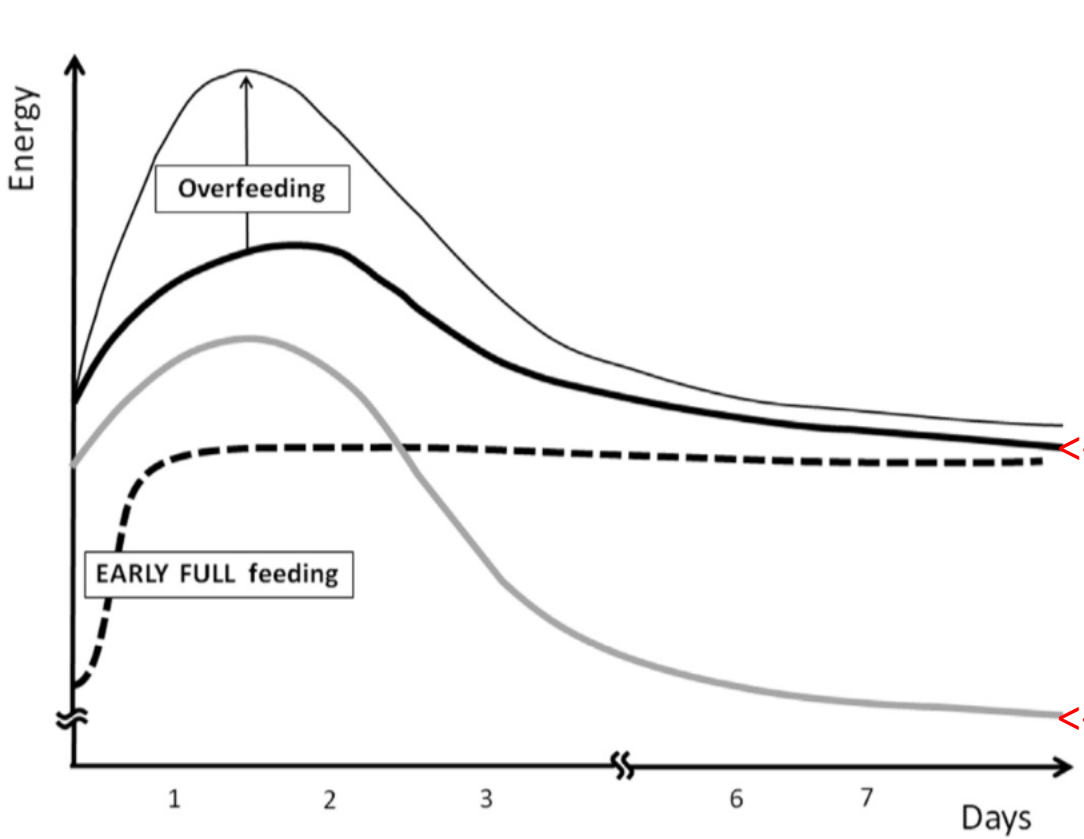
SUMMARY

ERNÆRING TIL KRITISK SYGE

DASAIM

Udarbejdet af:
Jørgen Wiis, Overlæge, Intensiv Terapi Klinik 4131, Rigshospitalet
Lise Skytegaard Balkert, Afdelingslæge, NIA Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Meike Tomsech Belmadi, Overlæge, Thorax Intensiv Afsnit TIA, Aalborg Universitetshospital
Camilla Radbro Dalgaard, Afdelingslæge, Thorax anæstesi og intensiv, Aalborg Universitetshospital
Pernille Haure, Overlæge, Neurointensivt Afsnit NOTIA, Aalborg Universitetshospital
Dorte Blum, Overlæge, Intensiv Afdeling ITA, Aarhus Universitetshospital
Margrethe Jermiin Jensen, Afdelingslæge, VITA/BTV Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Pia Lawaetz-Smith, Overlæge, Afdelingen for beåndelse og intensiv behandling, Neurocentret, Rigshospitalet
Jens Michelsen, Overlæge, ITA Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Ulrik Skram, Overlæge, Intensiv Afdeling, Nordsjællands Hospital

National behandlingsvejledning 2024



<-Total Energy Expenditure

<-Endogenous energy production

Indirect calorimetry in nutritional therapy. A position paper by the ICALIC study group

Taku Oshima [a], Mette M. Berger [b], Elisabeth De Waele [c], Anne Berit Guttormsen [d, e, f], Claudia-Paula Heidegger [g], Michael Hiesmayr [h], Pierre Singer [i], Jan Wernerman [j], Claude Pichard [k, *]

Clin Nutr 2017

Nok, ikke for meget

CLINICAL GUIDELINES

Guidelines for the provision of nutrition support therapy in the adult critically ill patient: The American Society for Parenteral and Enteral Nutrition

Charlene Compher PhD, RD[1] | Angela L. Bingham PharmD[2,3] | Michele McCall MSc, RD[2] | Jayshil Patel MD[3] | Todd W. Rice MD, MSc[4] | Carol Braunschweig PhD[5] | Lian McKeever PhD, RDN[1]

Abstract

Background: This guideline updates recommendations from the 2016 American Society for Parenteral and Enteral Nutrition (ASPEN)/Society of Critical Care Medicine (SCCM) critical care nutrition guideline for five foundational questions central to critical care nutrition support.

Methods: The Grading of Recommendations, Assessment, Development and Evaluation (GRADE) process was used to develop and summarize evidence for clinical practice recommendations. Clinical outcomes were assessed for (1) higher vs lower energy dose, (2) higher vs lower protein dose, (3) exclusive isocaloric parenteral nutrition (PN) vs enteral nutrition (EN), (4) supplemental PN (SPN) plus EN vs EN alone, (5A) mixed oil lipid injectable emulsions (ILE) vs soybean oil, and (5B) fish oil (FO)- containing ILE vs non-FO ILE. To assess safety, weight-based energy intake and protein were plotted against hospital mortality.

Results: Between January 1, 2001, and July 15, 2020, 2320 citations were identified and data were abstracted from 36 trials including 20,578 participants. Patients receiving FO had decreased pneumonia rates of uncertain clinical significance. Otherwise, there were no differences for any outcome in any question. Owing to a lack of certainty regarding harm, the energy prescription recommendation was decreased to 12–25 kcal/kg/day.

Conclusion: No differences in clinical outcomes were identified among numerous nutrition interventions, including higher energy or protein intake, isocaloric PN or EN, SPN, or different ILEs. As more consistent critical care nutrition support data become available, more precise recommendations will be possible. In the meantime, clinical judgment and close monitoring are needed. This paper was approved by the ASPEN Board of Directors.

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

ESPEN Guideline

ESPEN practical and partially revised guideline: Clinical nutrition in the intensive care unit

Pierre Singer [a,*], Annika Reintam Blaser [b,c], Mette M. Berger [d], Philip C. Calder [e], Michael Casaer [f], Michael Hiesmayr [g], Konstantin Mayer [h], Juan Carlos Montejo-Gonzalez [i], Claude Pichard [j], Jean-Charles Preiser [k], Wojciech Szczeklik [l], Arthur R.H. van Zanten [m], Stephan C. Bischoff [n]

ARTICLE INFO

SUMMARY

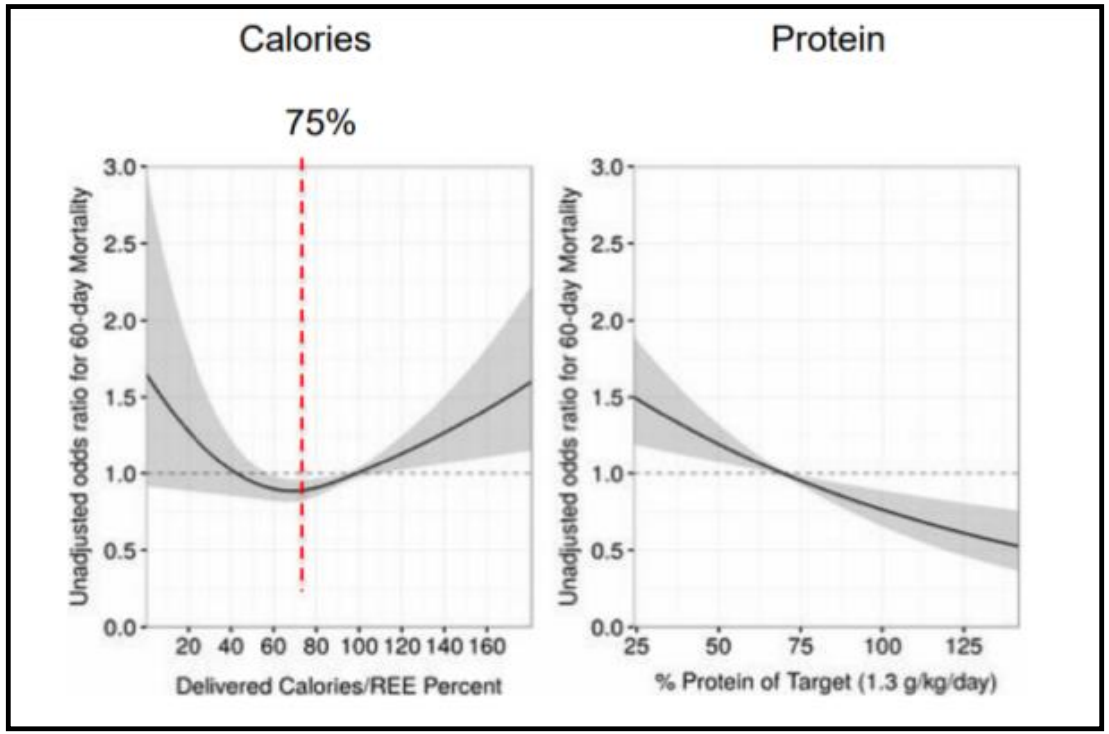
ERNÆRING TIL KRITISK SYGE

DASAIM

Udarbejdet af:

Jørgen Wits, Overlæge, Intensiv Terapi Klinik 4131, Rigshospitalet
Lise Skytegaard Balkert, Afdelingslæge, NIA Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Meike Tomsech Behnadi, Overlæge, Thorax Intensiv Afsnit TIA, Aalborg Universitetshospital
Camilla Radbo Dalgaard, Afdelingslæge, Thorax anæstesi og intensiv, Aalborg Universitetshospital
Pernille Haure, Overlæge, Neurointensivt Afsnit NOTIA, Aalborg Universitetshospital
Dorte Ilkun, Overlæge, Intensiv Afdeling ITA, Aarhus Universitetshospital
Margrethe Jermiin Jensen, Afdelingslæge, VITA/BTV Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Pia Lawaetz-Smith, Overlæge, Afdelingen for hedrevlse og intensiv behandling, Neurocentret, Rigshospitalet
Jens Michelsen, Overlæge, ITA Anæstesiologisk-Intensiv Afdeling V, Odense Universitetshospital
Ulrik Skram, Overlæge, Intensiv Afdeling, Nordsjællands Hospital

National behandlingsvejledning 2024



Zusman et al. Critical Care (2016) 20:367

Ernærings screening

NRS 2002 ☺
MUST ☺
NUTRIC 😆

ESPEN 2023:
ITA ophold >2 dage
Respiratorbehandling
Infektion
Ikke ernæret >5 dage
eller
Svær kronisk sygdom

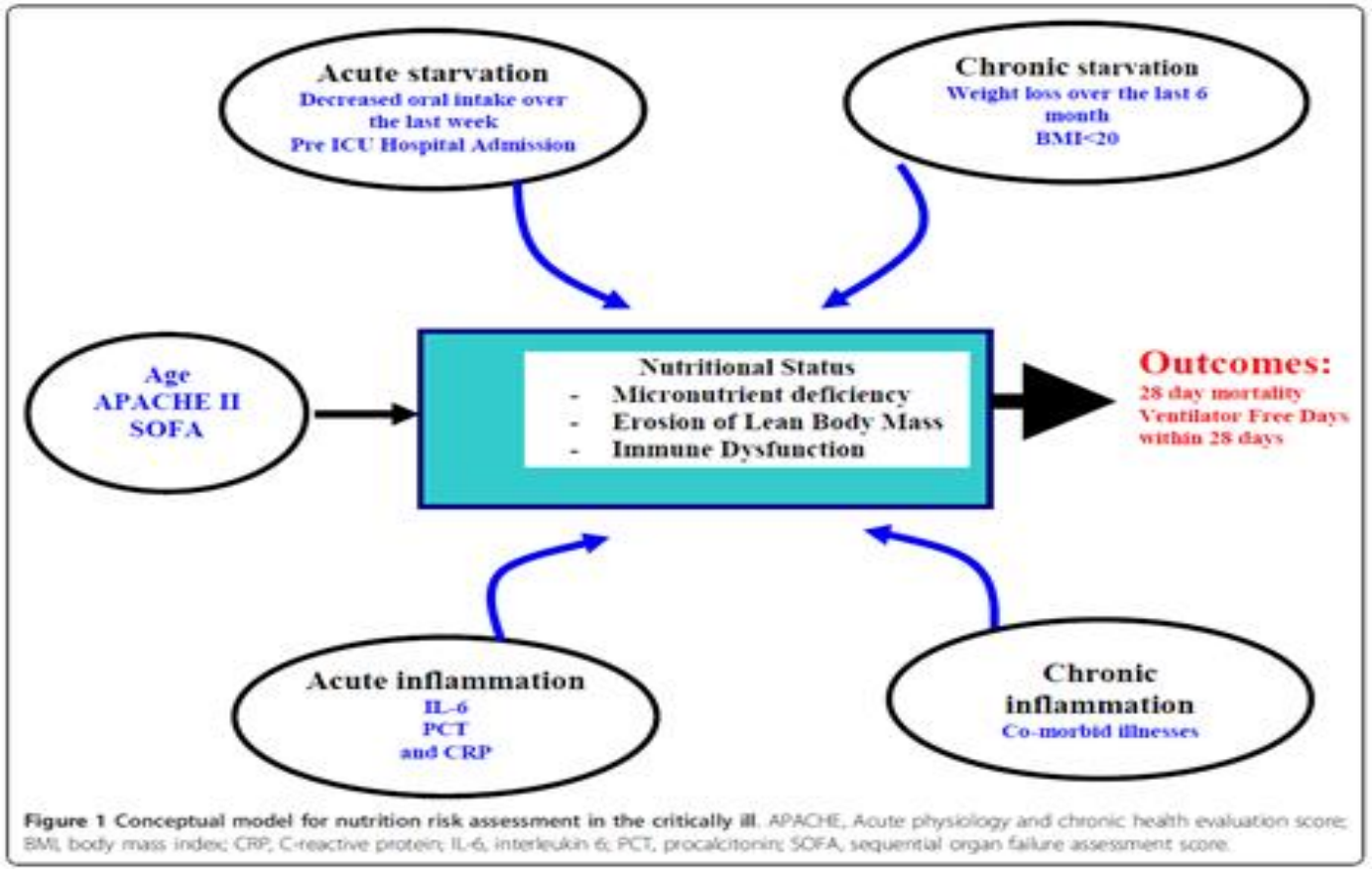
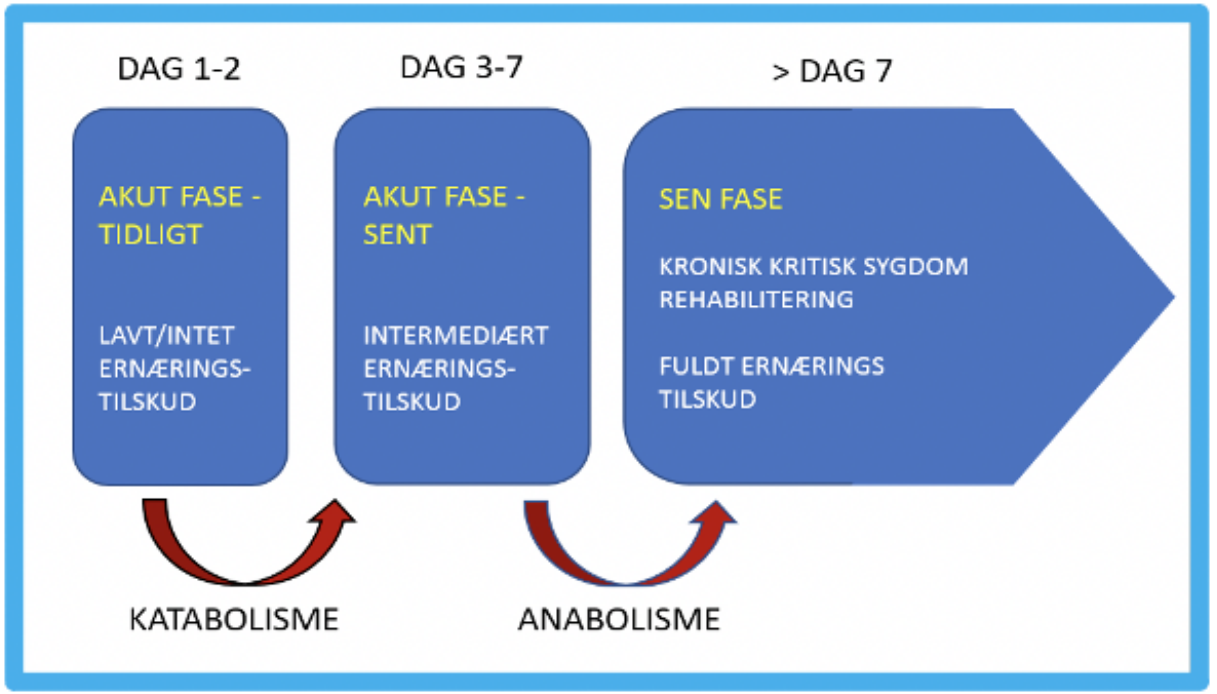


Figure 1 Conceptual model for nutrition risk assessment in the critically ill. APACHE, Acute physiology and chronic health evaluation score; BMI, body mass index; CRP, C-reactive protein; IL-6, interleukin 6; PCT, procalcitonin; SOFA, sequential organ failure assessment score.

Ernæringsfaser

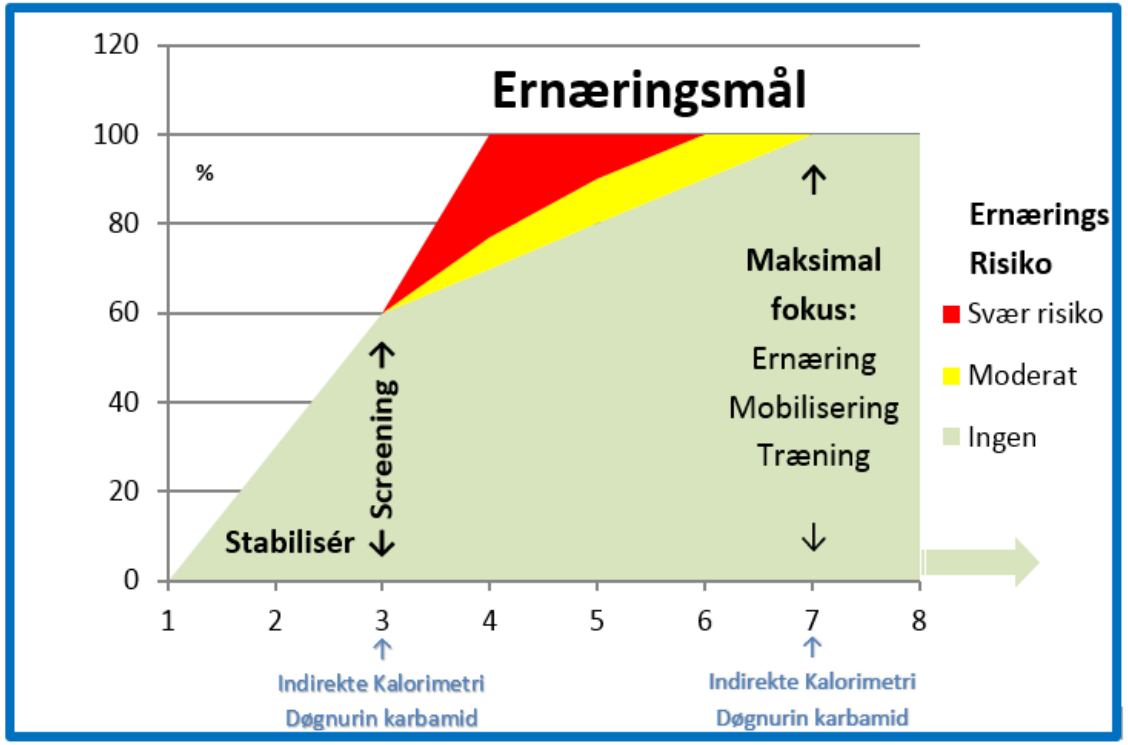
Faser



Figur 1. Akut, stabiliserende, protraheret eller kronisk kritisk sygdom fordrer differentieret tilgang til ernæringsterapi. Egen illustration.

1 - 3 - 7+


ONE SIZE
DOES NOT
FIT ALL


Ernæringsmål
120
100
80
60
40
20
0
%
1
2
3
4
5
6
7
8
Screening
Stabilisér
Maksimal
fokus:
Ernæring
Mobilisering
Træning
Ernærings
Risiko
Svær risiko
Moderat
Ingen
Indirekte Kalorimetri
Døgnurin karbamid
Indirekte Kalorimetri
Døgnurin karbamid

ESPEN ALGORITMER 2023

Clinical nutrition in ICU

1) Every critically ill patient staying for more than 48 h in the ICU should be considered at risk for malnutrition. (S1, 96%)

2) Medical nutrition therapy shall be considered for all patients staying in the ICU, mainly for more than 48 h (R1, GPP, 100%)

Oral nutrition possible?

yes → Oral nutrition (at least partial oral nutrition)

3) Oral diet shall be preferred over EN or PN in critically ill patients who are able to eat. (R3, GPP, 100%)

no → Contraindication for EN?

yes → Screening and Assessment

4) A general clinical assessment should be performed to assess malnutrition in the ICU, until a specific tool has been validated. (R2, GPP, 100%)

no → Early enteral nutrition

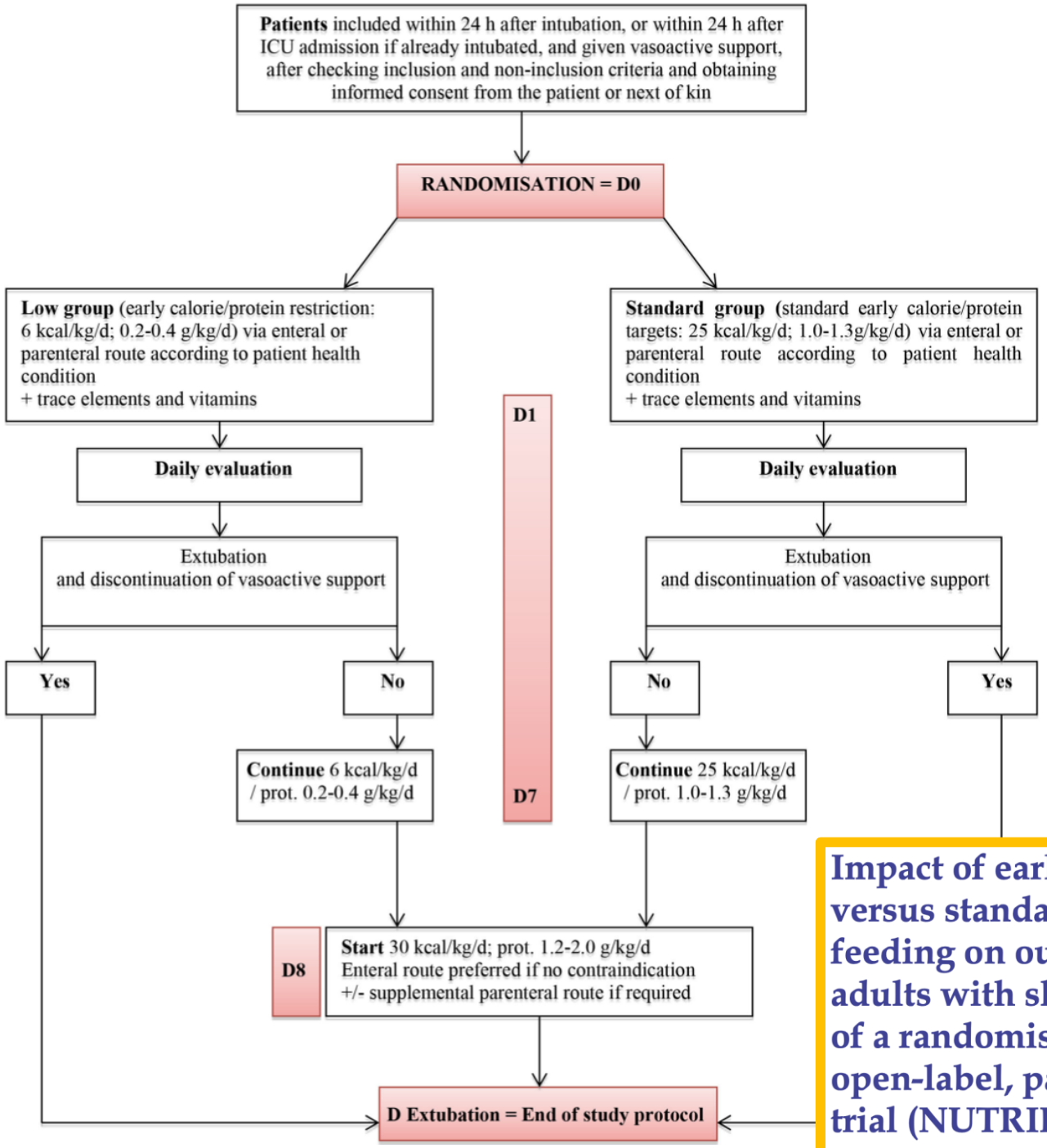
Malnutrition confirmed?

yes → Early parenteral nutrition

5) To avoid overfeeding, early full EN and PN shall not be used in critically ill patients but shall be prescribed within three to seven days. (R8, A, 100%)

no → No early nutrition

Fig. 3 + 4



Timing

Impact of early low-calorie low-protein versus standard-calorie standard-protein feeding on outcomes of ventilated adults with shock: design and conduct of a randomised, controlled, multicentre, open-label, parallel-group trial (NUTRIREA-3)

	Low group (n=1521)	Standard group (n=1515)	Absolute difference (95% CI)	Hazard ratio (95% CI)	p value
Primary outcomes					
Day 90 mortality	628 (41·3%)	648 (42·8%)	−1·5 (−5·0 to 2·0)	..	0·41
Time to readiness for ICU discharge*	8·0 (5·0 to 14·0)	9·0 (5·0 to 17·0)	..	1·12 (1·02 to 1·22)	0·015
Secondary outcomes					
Day 28 mortality	504 (33·2%; n=1519)	533 (35·2%)	−2·0 (−5·4 to 1·4)	..	0·24
ICU mortality, cumulative incidence	29·6%	32·7%	..	0·89 (0·78 to 1·00)	0·051
Hospital mortality, cumulative incidence	32·2%	34·5%	..	0·93 (0·83 to 1·05)	0·24
ICU length of stay, days†	9·0 (5·0 to 15·0)	10·0 (6·0 to 17·0)	..	..	..
Acute-care hospital length of stay, days†	21·0 (12·0 to 38·0)	22·0 (14·0 to 39·0)	..	..	..
Time to weaning from vasopressor support, days	3·0 (2·0 to 4·0)	3·0 (2·0 to 4·0)	..	1·07 (0·99 to 1·15)	0·054
Time to invasive mechanical ventilation weaning, days	5·0 (2·0 to 11·0)	6·0 (3·0 to 12·5)	..	1·12 (1·03 to 1·22)	0·007
Received dialysis, cumulative incidence	30·1%	31·9%	..	0·93 (0·82 to 1·05)	0·25

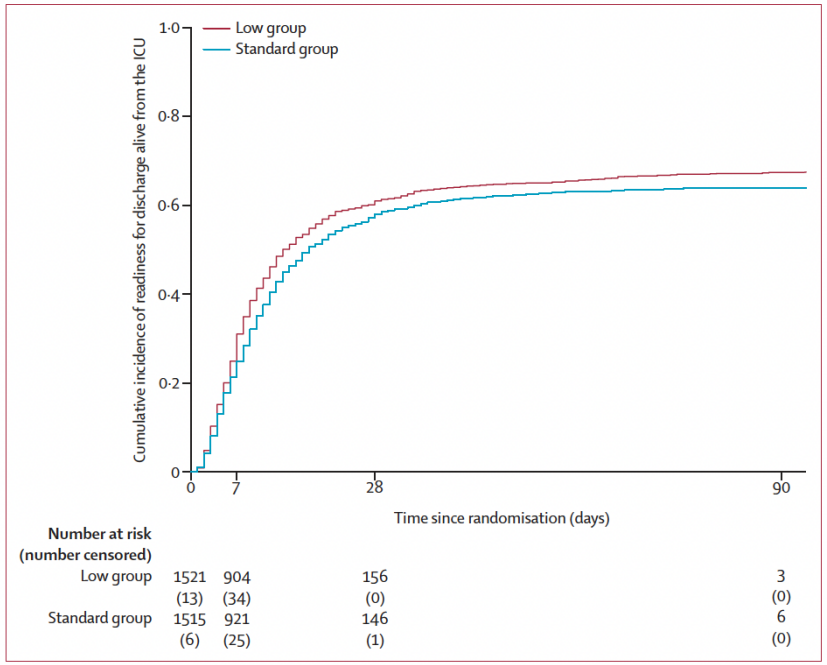


Figure 2: **Time to readiness for ICU discharge**
Cumulative incidence curves for patients who achieved readiness for ICU discharge. ICU=intensive care unit.

THE LANCET
Respiratory Medicine

Volume 11, Issue 7, July 2023, Pages 602-612

Timing

Impact of early low-calorie low-protein versus standard-calorie in feeding on outcomes of adults with shock: desig of a randomised, control e, open-label, parallel-grou trial (NUTRIREA-3)

ESPEN ALGORITMER 2023

Early medical nutrition (EN / PN)

Early enteral nutrition

6) If oral intake is not possible, early EN (within 48 hours) in critically ill adult patients should be performed/initiated rather than delaying EN (R4, B, 100%)

7) If oral intake is not possible, early EN (within 48 hours) shall be performed/initiated in critically ill adult patients rather than early PN (R5, A, 100%)

8) Early EN should be performed

- in patients receiving extracorporeal membrane oxygenation (ECMO)
- in patients with traumatic brain injury
- in patients with stroke (ischemic or hemorrhagic)
- in patients with spinal cord injury
- in patients with severe acute pancreatitis
- in patients after gastrointestinal surgery
- in patients after abdominal aortic surgery
- in patients with abdominal trauma when the continuity of the GI tract is confirmed/restored
- in patients receiving neuromuscular blocking agents
- in patients managed in prone position
- In patients with open abdomen
- regardless of the presence of bowel sounds unless bowel ischemia or obstruction is suspected
- in patients with diarrhea

(R40, B, 96%)

Early parenteral nutrition

9) Early and progressive PN can be provided instead of no nutrition in case of contraindications for EN in severely malnourished patients. (R7, 0, 95%)

10) In patients who do not tolerate full dose EN during the first week in the ICU, the safety and benefits of initiating PN should be weighed on a case-by-case basis. (R20, GPP, 96%)

ESPEN ALGORITMER 2023

Delayed medical nutrition (EN / PN)

Contraindication for EN?

- no → **Enteral Nutrition (EN)**
- yes → **Parenteral Nutrition (PN) partial if possible**

11) EN should be delayed
- if shock is uncontrolled and hemodynamic and tissue perfusion goals are not reached, whereas low dose EN can be started as soon as shock is controlled with fluids and vasopressors/inotropes, while remaining vigilant for signs of bowel ischemia;
- in case of uncontrolled life-threatening hypoxemia, hypercapnia or acidosis, whereas EN can be started in patients with stable hypoxemia, and compensated or permissive hypercapnia and acidosis;
- in patients suffering from active upper gastrointestinal bleeding, whereas EN can be started when the bleeding has stopped and no signs of re-bleeding are observed;
- in patients with overt bowel ischemia;
- in patients with high-output intestinal fistula if reliable feeding access distal to the fistula is not achievable;
- in patients with abdominal compartment syndrome; and
- if gastric aspirate volume is above 500 mL/6 h.

(R38, B, 100%)

12) Low dose EN should be administered
- in patients receiving therapeutic hypothermia and increasing the dose after rewarming;
- in patients with intra-abdominal hypertension without abdominal compartment syndrome, whereas temporary reduction or discontinuation of EN should be considered when intra-abdominal pressure values further increase under EN; and
- in patients with acute liver failure when acute, immediately life-threatening metabolic derangements are controlled with or without liver support strategies, independent on grade of encephalopathy.

(R39, B, 96%)

17) In case of contraindications to oral and EN, PN should be implemented within three to seven days. (R6, B, 89%)

18) PN should not be started until all reasonable strategies to improve EN tolerance have been attempted. (R21, updated, GPP, 100%)

EN Route of administration

13) In patients deemed to be at high risk for aspiration, postpyloric, mainly jejunal feeding can be performed. (R12, GPP, 95%)

14) Continuous rather than bolus EN should be used. (R9, B, 95%)

15) Gastric access should be used as standard approach to initiate EN. (R10, GPP, 100%)

16) In patients with gastric feeding in-tolerance not solved with prokinetic agents, postpyloric feeding should be used. (R11, B, 100%)

ESPEN ALGORITMER 2023

Energy and protein targets

1

Determination of energy needs

2

Calorimetry available?

yes

19) In critically ill mechanically ventilated patients, EE should be determined by using indirect calorimetry. (R15, B, 95%)

20) If indirect calorimetry is used, isocaloric nutrition rather than hypocaloric nutrition can be progressively implemented after the early phase of acute illness. (R16, 0, 95%)

no

VO_2/VCO_2 available?

yes

21) If calorimetry is not available, using VO_2 (oxygen consumption) from pulmonary arterial catheter or VCO_2 (carbon dioxide production) derived from the ventilator will give a better evaluation on energy expenditure than predictive equations. (S2, 82%)

no

22) If predictive equations are used to estimate the energy need, hypocaloric nutrition (below 70% estimated needs) should be preferred over isocaloric nutrition for the first week of ICU stay. (R19, B, 95%)

23) Hypocaloric nutrition (not exceeding 70% of EE) should be administered in the early phase of acute illness. (R17, B, 100%)

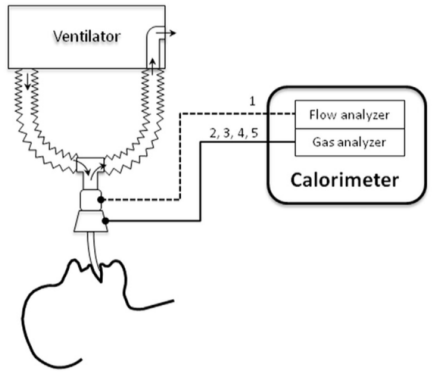
24) After day 3, caloric delivery can be increased up to 80 - 100% of measured energy expenditure . (R18, 0, 95%)

Protein intake and exercise

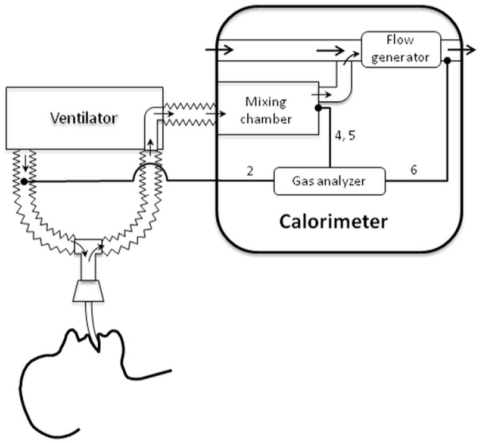
25) During critical illness, 1.3 g/kg protein equivalents per day can be delivered progressively. (R22, updated, 0, 92%)

26) Physical activity may improve the beneficial effects of nutritional therapy (S3, 86%)

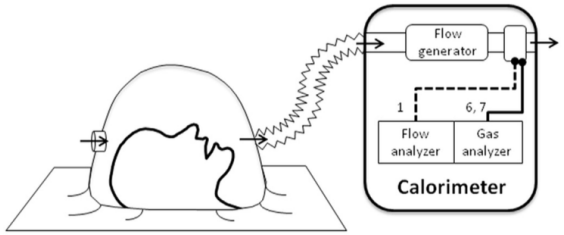
indirekte kalorimetri



a. Breath by breath



b. Mixing chamber



c. Canopy

ICALIC Clinical Nutrition 36 (2017) 651-662

indirekte kalorimetri

Equations used for the calculations related to indirect calorimetry

Calculations of O_2 consumption and CO_2 production

$VO_2 = (Vi \times FiO_2) - (Ve \times FeO_2)$

$VCO_2 = (Ve \times FeCO_2) - (Vi \times FiCO_2)$

Haldane transformation

Assumption based on the concept that N_2 is constant in inspired and expired gas

$Vi = [FeN_2/FiN_2] \times Ve$

$FeN_2 = (1 - FeO_2 - FeCO_2)$

$FiN_2 = (1 - FiO_2 - FiCO_2)$

If $FiCO_2$ of 0.03–0.05% is ignored,

$VO_2 = [(1 - FeO_2 - FeCO_2) \times (FiO_2 - FeO_2) \times Ve]/(1 - FiO_2)$

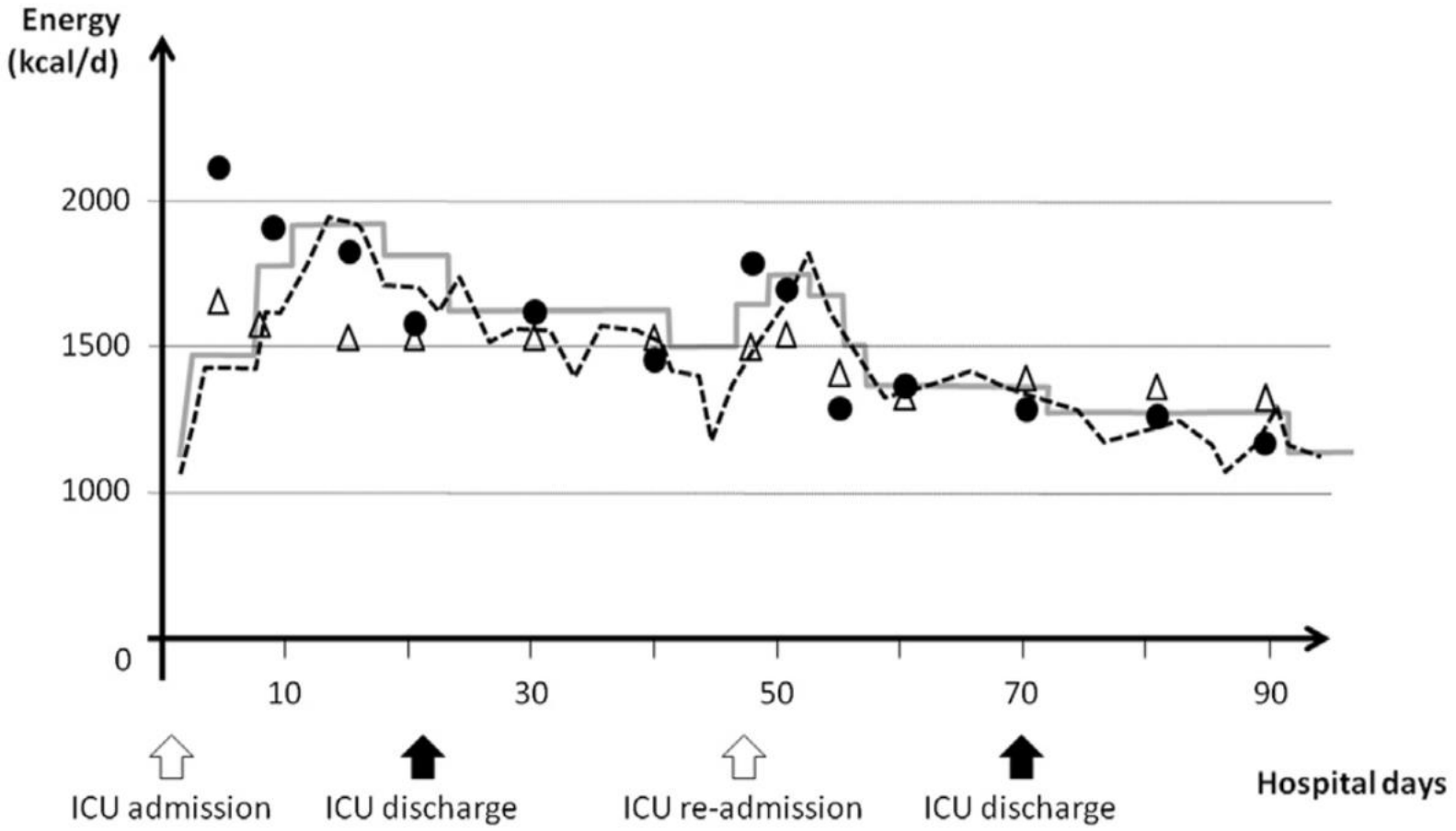
Weir's equation

$EE = [(VO_2 \times 3.941) + (VCO_2 \times 1.11) + (u\,N_2 \times 2.17)] \times 1.44$

VO_2: O_2 consumption (L/min), VCO_2: CO_2 production (L/min), Vi: inspired volume (L), Ve: expired volume (L), FiO_2: fraction of inspired oxygen, FeO_2: fraction of expired oxygen, FeN_2: fraction of expired nitrogen, FiN_2: fraction of inspired nitrogen, EE: energy expenditure (kcal/d), uN_2: urinary nitrogen (g/d).

ICALIC Clinical Nutrition 36 (2017) 651-662

Nok energi og protein, ikke for meget



ICALIC. Clinical Nutrition 36 (2017) 651-662

Aminosyre – Protein omsætning blandt kritisk syge

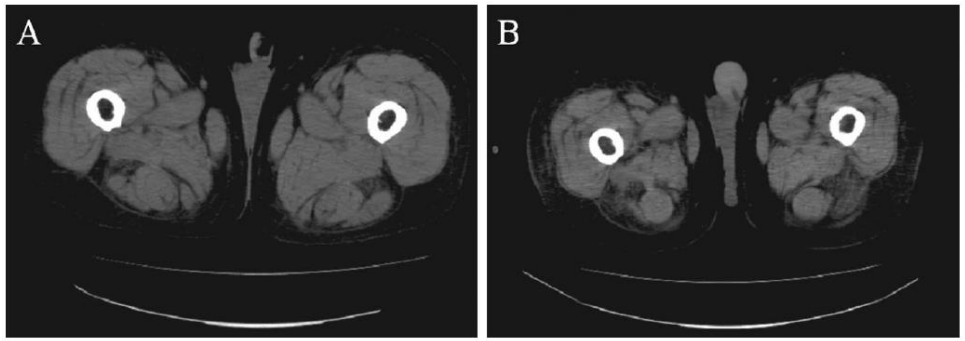
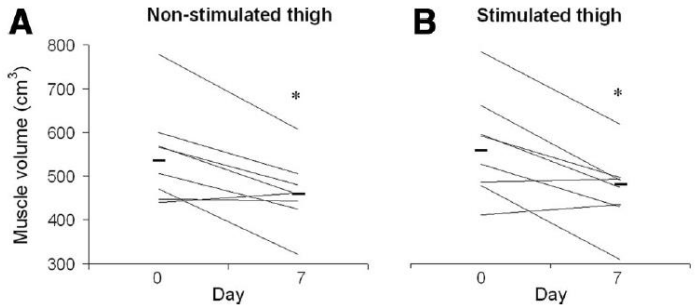
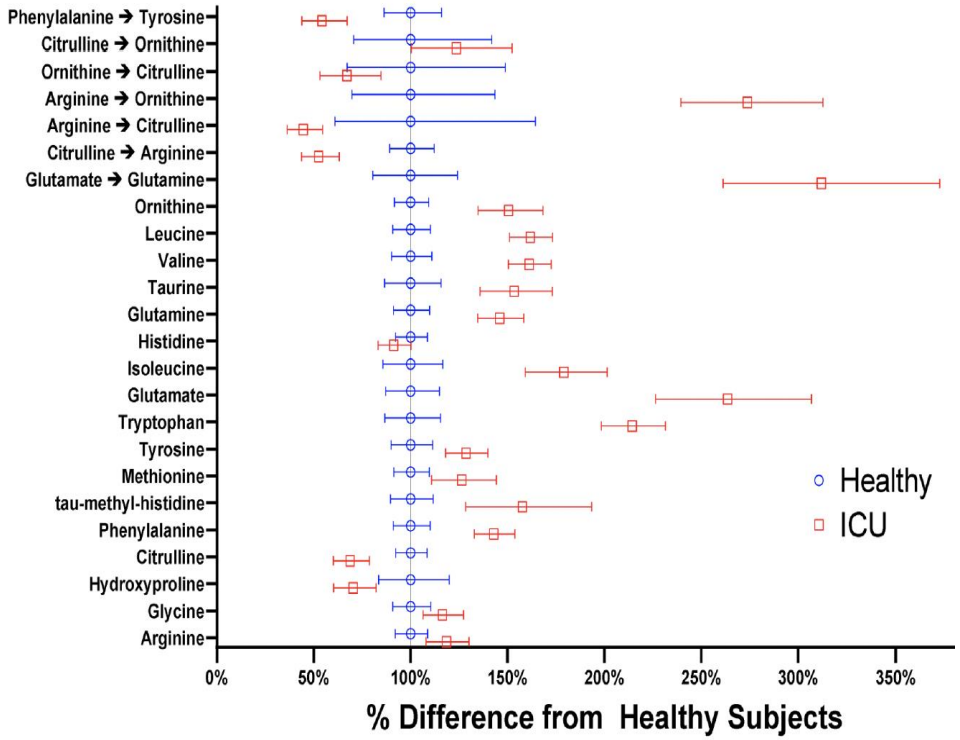


Figure 2. Computed tomographic scans of the thigh in a patient with septic shock at baseline (*A*) and 7 days later (*B*) showing the changes in muscle volume.

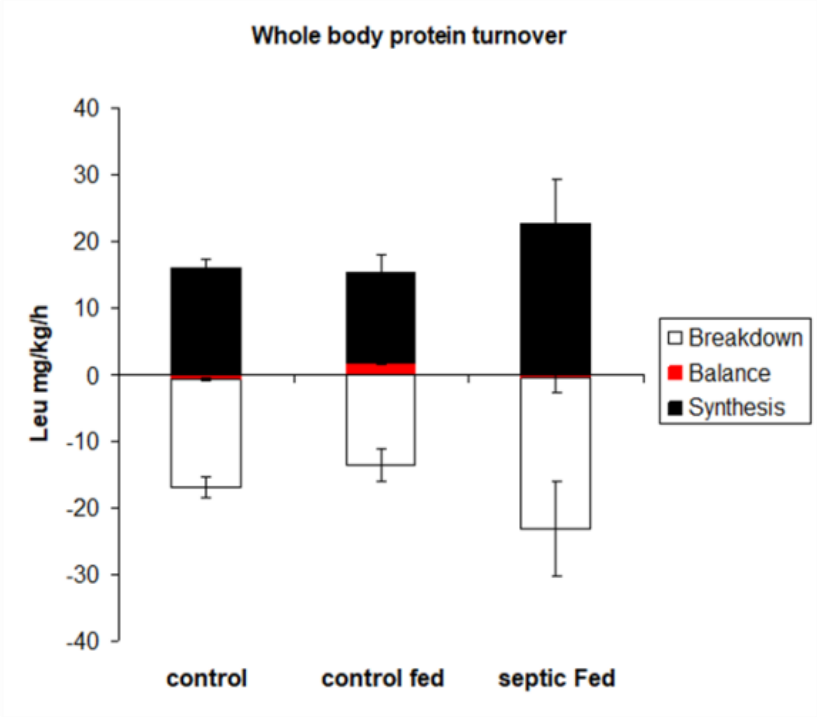


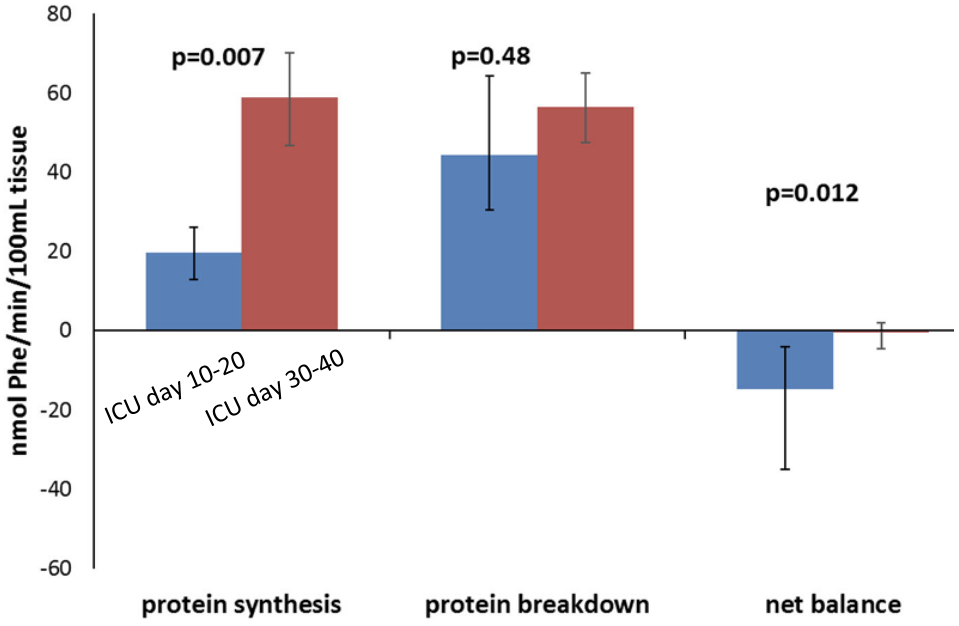
Poulsen JB. CCM 2011



Deutz Clinical Nutrition 2021

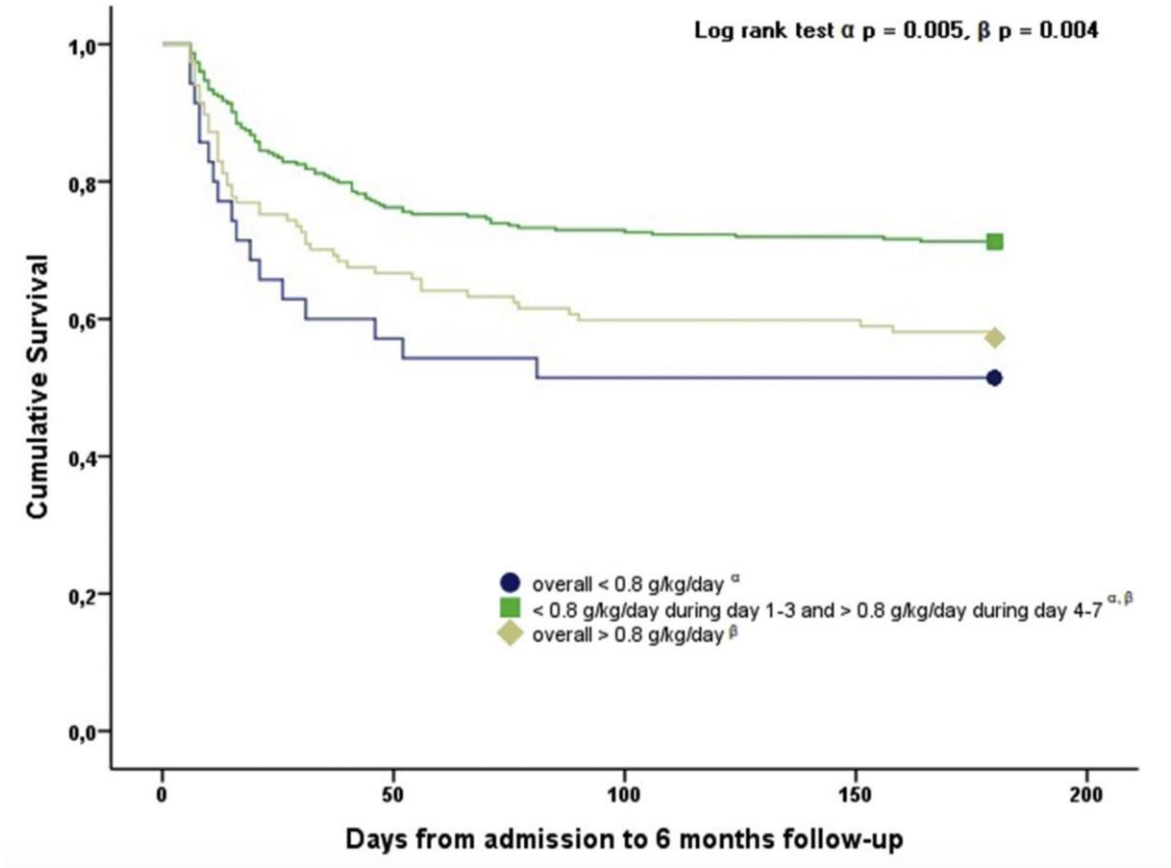
Aminosyre – Protein omsætning blandt kritisk syge





Clinical Nutrition 2015 Rooyackers Critical care 2018

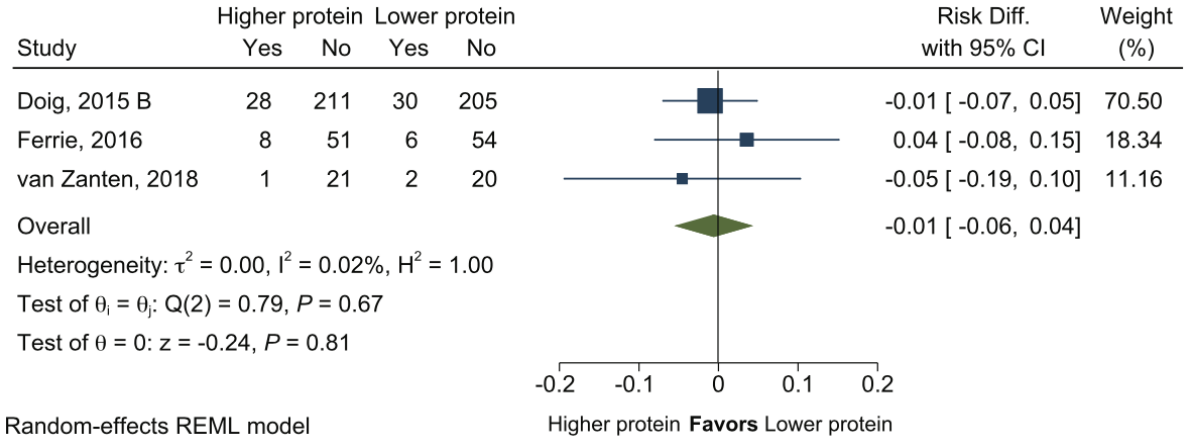
Nok, ikke for meget



”Although overall low protein intake is associated with the highest mortality risk, high protein intake during the first 3-5 days of ICU stay is also associated with increased long-term mortality”.

Koekkoek et al. Clin Nutr. 2019; 38(2):883-890

dosis, høj/lav



ASPEN 2021 Recommendation:

There was no difference in clinical outcomes in the relatively limited data. Because of a paucity of trials with high-quality evidence, we cannot make a new recommendation beyond the 2016 guideline suggestion for 1.2–2.0 g/kg/day.

Quality of evidence: Low

Strength of recommendation: Weak

ESPEN 2023 Recommendation:

During critical illness, 1.3 g/kg protein equivalents per day can be delivered progressively.

No evidence for higher dosing.

R22, updated, Grade 0, strong consensus, 92%

The effect of higher protein dosing in critically ill patients with high nutritional risk (EFFORT Protein): an international, multicentre, pragmatic, registry-based randomised trial

Daren… …gala, Court… EFFO…

Sur…

Bac… …a wide ran… …to test the… …omes.

Me… …ial was un… …3 years) un… …al dose pr… …nsition to… …by site. As… …nicians, bu… …scharge- al… …nts were ar… …nts who di… …ed with C…

F… …cluded in t… …tion, the …ompared …·27). The …48) in the …ith higher protein provision being particularly harmful in p… …e scores at baseline.

Interpretation Delivery of higher doses of protein to mechanically ventilated critically ill patients did not improve the time-to-discharge-alive from hospital and might have worsened outcomes for patients with acute kidney injury and high organ failure scores.

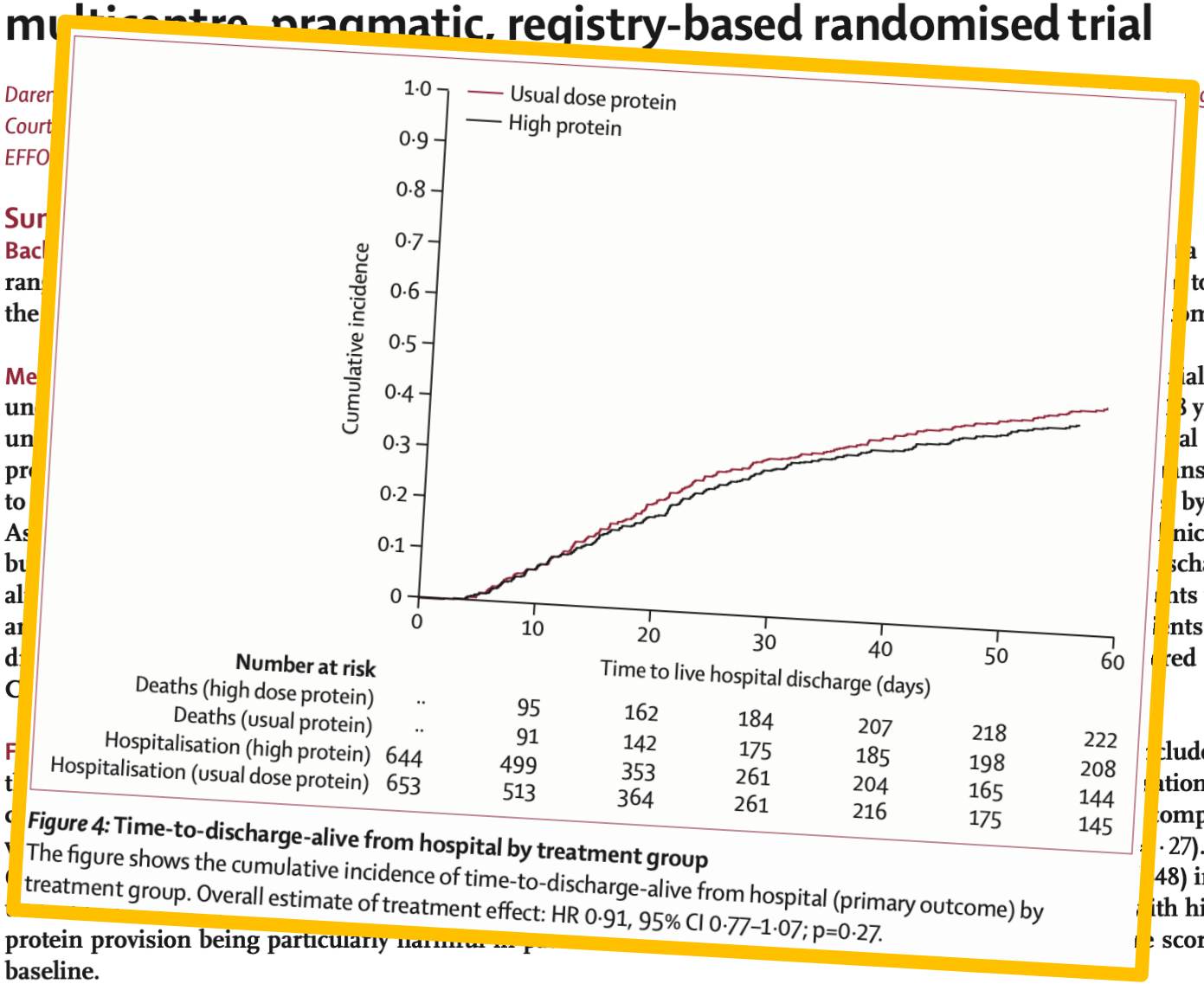


Figure 4: **Time-to-discharge-alive from hospital by treatment group**
The figure shows the cumulative incidence of time-to-discharge-alive from hospital (primary outcome) by treatment group. Overall estimate of treatment effect: HR 0·91, 95% CI 0·77–1·07; p=0·27.

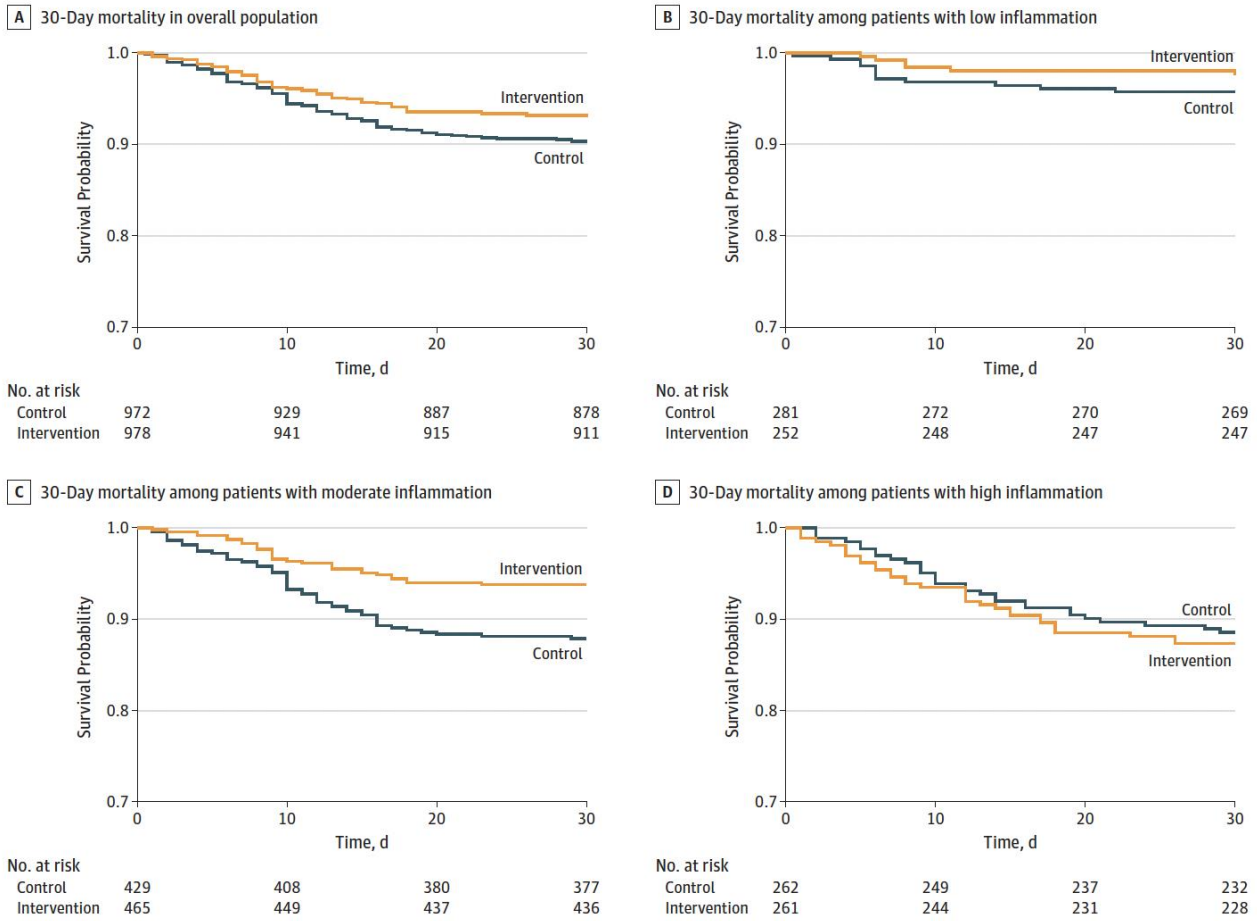
www.thelancet.
Published onlin…
January 25, 20…

Inflamm

Association of Baseline Inflammation With Effectiveness of Nutritional Support Among Patients With Disease-Related Malnutrition
A Secondary Analysis of a Randomized Clinical Trial

Meret Merker, MD; Martina Felder, BMSc; Louise Gueissaz, BMSc; Rebekka Bolliger, MD; Pascal Tribolet, MSc; Nina Kägi-Braun, MD; Filomena Gomes, PhD; Claus Hoess, MD; Vojtech Pavlicek, MD; Stefan Bilz, MD; Sarah Sigrist, MD; Michael Brändle, MD; Christoph Henzen, MD; Robert Thomann, MD; Jonas Rutishauser, MD; Drahomir Aujesky, MD; Nicolas Rodondi, MD, MAS; Jaques Donzé, MSc; Zeno Stanga, MD; Beat Mueller, MD; Philipp Schuetz, MD, MPH

Figure 2. Kaplan-Meier Estimate for Time to Death Within 30 Days According to Inflammatory Status



EFFORT2.
JAMA 2020;3(3)
EFFORT. Lancet 2019;393(10188):2312-2321

- Low inflammation:

  CRP < 10 mg/L
- Moderate:
  CRP 10-100 mg/L
- High:
  CRP > 100 mg/L

En simpel metode til beregning af proteinbevovet

Urin opsamling og beregning af nitrogenbalancen

ESPEN Guidelines

Proteinbehov (g/dag) = (dU-karbamid (mmol/d) x 0,18)
+ 25 g for fæcestab

Ved hæmodialyse: Daglig stigning i p-karbamid (mmol/l) x vægt (kg) x 0,11) + (dU-karbamid mmol x 0,18)
+ 25 g for fæcestab
(+ 16 g tab i dialysefiltret/IHD)

Ved CRRT: Tillæg 0,2 g/liter ultrafiltrat/dag svarende til aminosyretabet i ultrafiltratet

Lavere doser

Screening viser	Strategi	Mål
Svær risiko	**Start** supplerende tiltag: Prokinetisk behandling, postpylorisk ernæring, parenteral ernæring	Hvis stabil: Nå 100% senest dag 4 Undgå refeeding
Moderat risiko	**Overvej** supplerende tiltag	Hvis stabil: Nå 100% senest dag 5-7 Undgå refeeding
Ingen risiko	**Fortsæt** optitrering af oral/enteral ernæring	Max. 60% dag 3. Forcér ikke Byg gradvis op til 100% dag 8

Specifikke ernæringsbehov

	Fase	% af ernæringsmål	Kalorier/kg	Protein/kg	Fedt/kg
Dag 1-3	Resuscitation	0 -> **max.** 60	<15	<0.8*	<0,6***
Dag 4-7	Stabilisering	60 -> 100	15 -> 25	0.8 -> 1.2**	<1,0***
Dag 7+	Stabil	**100**	**25-30**	**≥1.3****	**0,7-1,5**

* Stor agtpågivenhed ved hyperinflammation, ukontrollabel sepsis, multiorgandysfunktion, AKI

** Agtpågivenhed ved hyperinflammation, ukontrollabel sepsis, multiorgandysfunktion, AKI

Ernæringsrisiko

Tabel 1. Ernæringsrisiko

Risiko for underernæring	Moderat, 2 af følgende	Svær, 2 af følgende
Vægttab	5 – 10 % indenfor 6 måneder	> 10 % indenfor 6 måneder
BMI ifht alder år	≤70 år: BMI<20, >70 år: BMI<22	≤70 år: BMI<18.5, >70 år: BMI<20
Kostindtag / Tarmfunktion	Nedsat >2 uger / Noget nedsat	<50 % i > 1 uge / Svært nedsat
Dage på hospital før ITA	> 1 dag	> 7 dage
Sygdomsbyrde, kronisk	Kræft, lunge/lever/nyre-syg	
Sygdomsbyrde, akut		1 af flg: Brandsår, neurokir. traume

- Sepsis, hyperinflammation (CRP>100) og multiorgan dysfunktion er forbundet med negativt outcome ved fuld ernæring.
- Endnu er disse parametre ikke integreret i den internationale litteratur om ernæringsrisiko som defineret modvægt mod forcering af ernæring til ustabile kritisk syge.
- Signalerne mod dårlig outcome ved overernæring ved hyperinflammation og ustabilitet blandt kritisk syge er så stærke, at vi vælger at integrere dem med de kendte parametre fra NRS 2002 og ESPENs GLIM kriterier i en endnu ikke valideret samlet vurdering af risikofaktorer for under- og overernæring.
- Vores tabel for kombineret risikoberegning:

ErnæringsRisiko over/under

Tabel 1. Ernæringsrisiko		
Risiko for underernæring	**Moderat, 2 af følgende**	**Svær, 2 af følgende**
Vægttab	5 – 10 % indenfor 6 måneder	> 10 % indenfor 6 måneder
BMI ifht alder år	≤70 år: BMI<20, >70 år: BMI<22	≤70 år: BMI<18.5, >70 år: BMI<20
Kostindtag / Tarmfunktion	Nedsat >2 uger / Noget nedsat	<50 % i > 1 uge / Svært nedsat
Dage på hospital før ITA	> 1 dag	> 7 dage
Sygdomsbyrde, kronisk	Kræft, lunge/lever/nyre-syg	
Sygdomsbyrde, akut		1 af flg: Brandsår, neurokir. traume
Risiko for overernæring	**Moderat**	**Svær**
Sepsis, inflammation, MOF	CRP 50-100 og MOF	CRP>100 og MOF, akut nyresvigt

En endnu ikke valideret SAMLET vurdering af risikofaktorer for under- og overernæring..

Undgå overfodring

Kliniske og parakliniske indikationer på overdosering af næringsstoffer

Kalorier	Protein	Fedt
Høje blodsukkerniveauer uden kendt DM eller højdosis steroid	P-karbamid >30 mM uden blødning/AKI/cellehenfald	P-triglycerid >4,6 mM
Højt insulinbehov, eks. >120 ie/dag uden kendt DM	Stigende P-karbamid/kreatinin ratio	Leverenzymforhøjelse/-steatose
Manglende respiratoraftrapning i respiratorisk stabil fase (hyperkapni)	Stigende P- eller U-karbamid ved øget proteinindgift	Fedt overbelastnings syndrom
RQ-ratio >1 ved indirekte kalorimetri		Propofol relateret infusions syndrom
Ventrikelretention	Ventrikelretention	Ventrikelretention
Hyperglykæmi og samtidig laktat stigning ikke forklaret ved anden årsag		
Fosfat <0,65 mmol/l eller fald i fosfat >0,16 mmol/l efter start af ernæring		

BREAKING NEWS

ESPEN ALGORITMER 2023

Other substrates

Glucose / Carbohydrates

27) The amount of glucose (PN) or carbohydrates (EN) administered to ICU patients should not exceed 5 mg/kg/min. (R23, GPP, 100%)

Lipids

28) The administration of intravenous lipid emulsions should be generally a part of PN. (R24, GPP, 100%)

29) Intravenous lipid (including non-nutritional lipid sources) should not exceed 1.5 g lipids/kg/d and should be adapted to individual tolerance. (R25, GPP, 100%)

Glutamine (GLN)

30) In patients with burns > 20% body surface area, additional enteral doses of GLN (0.3 - 0.5 g/kg/d) should be administered for 10 - 15 days as soon as EN is commenced. (R26, B, 95%)*

31) In critically ill trauma, additional EN doses of GLN (0.2 - 0.3 g/kg/d) can be administered for the first five days with EN. In case of complicated wound healing it can be administered for a longer period of 10 – 15 days. (R27, 0, 91%)

32) In ICU patients except burn and trauma patients, additional enteral GLN should not be administered. (R28, B, 92%)

33) In unstable and complex ICU patients, particularly in those suffering from liver and renal failure, parenteral GLN - dipeptide shall not be administered. (R29, A, 92%)

* recommendation to be revised in the near future

Fish oil (omega-3)

34) High doses of omega-3-enriched EN formula should not be given by bolus administration. (R30, B, 91%)

35) EN enriched with omega-3 FA within nutritional doses can be administered. (R31, 0, 95%)

36) High doses omega-3 enriched enteral formulas should not be given on a routine basis. (R32, B, 90%)

37) Parenteral lipid emulsions enriched with EPA + DHA (Fish oil dose 0.1-0.2 g/kg/d) can be provided in patients receiving PN. (R33, updated, 0, 100%)

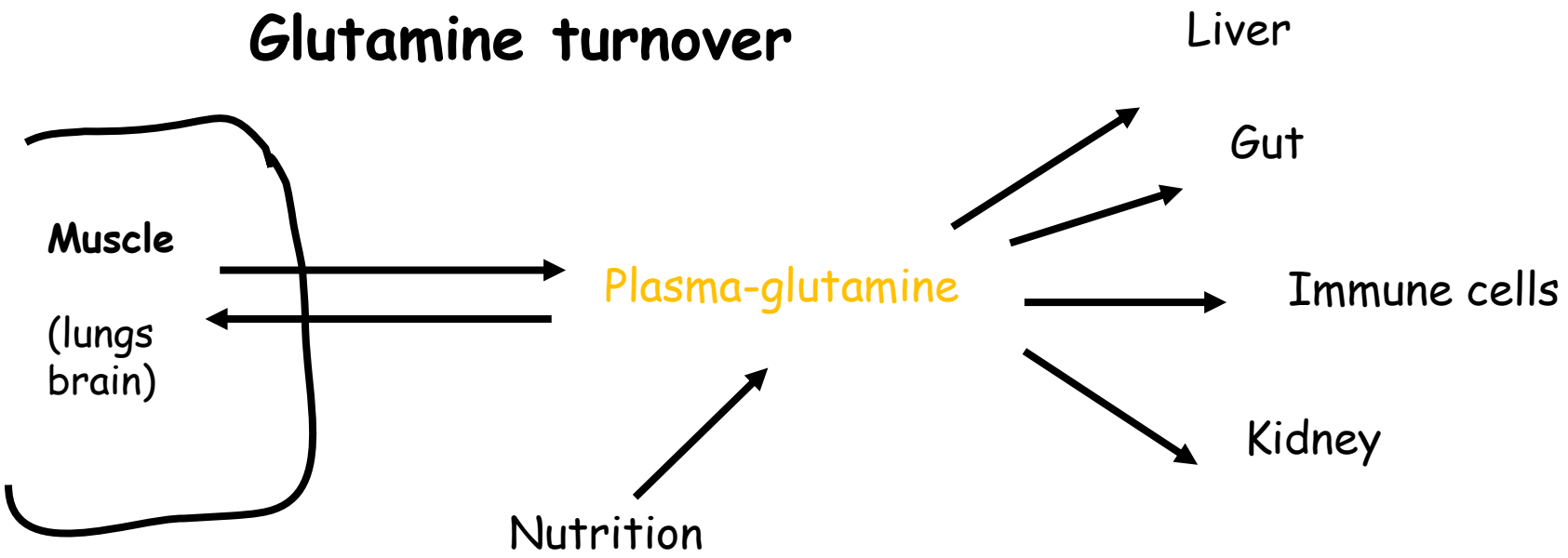
Micronutrients

38) To enable substrate metabolism, micronutrients (i.e. trace elements and vitamins) should be provided daily with PN. (R34, B, 100%)

39) Antioxidants as high-dose monotherapy or combination therapy should not be administered without proven deficiency. (R35, updated, A, 100%)

40) Vitamin D (25(OH)D) status can be determined in all patients considered at risk of vitamin D depletion or deficiency. (R36, updated, GPP, 100%)

Glutamin



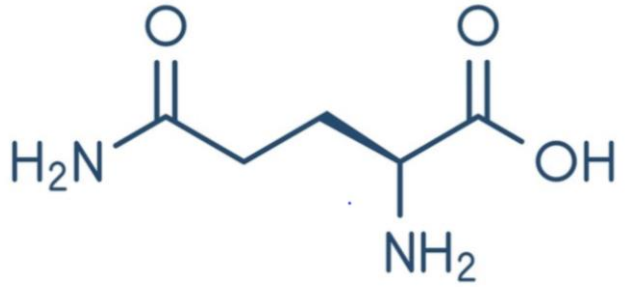
In critical ilness (sepsis, trauma, burns. mavor suraery)

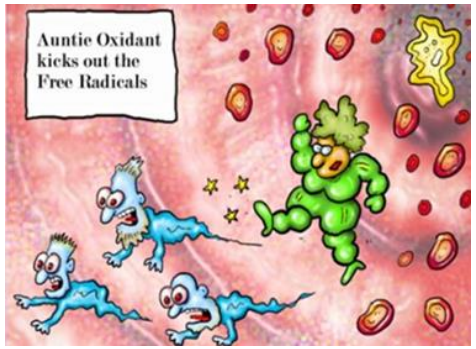
P-glutamin ↓(50-60 %)
musscle cell-glutamin ↓(25-40 %) →

- *Intestineal villi-atrophy*
- *Lymphocyte population in lamina prop. ↓*
- *Promotes bacterial translocation*
- *Decreases muscle protein synthesis*

In critical illness Glutamine becomes an "essential" amino acid

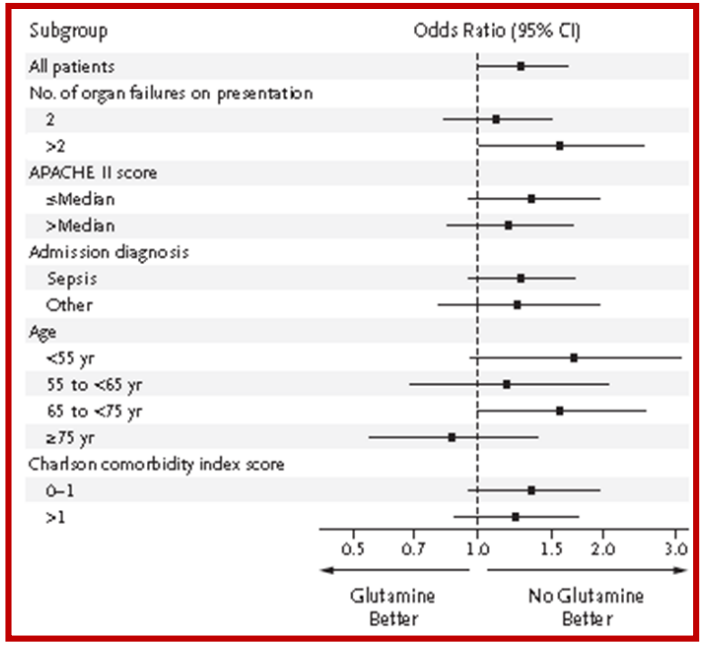
Glutamin





MRCT, factorial 2X2 design
1223 ptt, 2+ organ failures

Trend toward increased mortality
at 28 days with glutamine
32.4/27.2%; OR 1.28; P = 0.05
In-hospital + 6 months mortality
significantly higher w. glutamine
Glutamine had no effect on rates
of organ failure or infectious
complications
No differences in serious
adverse events, P = 0.83



Heyland
NEJM
2013

THE RE-*ENERGIZE* STUDY

Glutamin

BACKGROUND

Glutamine is thought to have beneficial effects on the metabolic and stress response to severe injury.

Clinical trials involving patients with burns and other critically ill patients have shown conflicting results regarding the benefits and risks of glutamine supplementation.

METHODS

In a double-blind, placebo RCT, we assigned patients with deep second- or third-degree burns (affecting ≥10% to ≥20% of total body-surface area, depending on age) within 72 hours after hospital admission to receive 0.5 g/kg/ per day of enterally delivered glutamine or placebo.

Trial agents were given every 4 hours through a feeding tube or three or four times a day by mouth until 7 days after the last skin grafting procedure, discharge from the acute care unit, or 3 months after admission, whichever came first.

Primary outcome was time to discharge alive from the hospital, with data censored at 90 days.

We calculated subdistribution hazard ratios falive, which took into account death as a competing risk or discharge

RESULTS

1200 patients with severe burns (mean burn size, 33% of total BSA) included in the analysis (596 in glutamine and 604 in placebo group).

Median time to discharge alive from hospital:

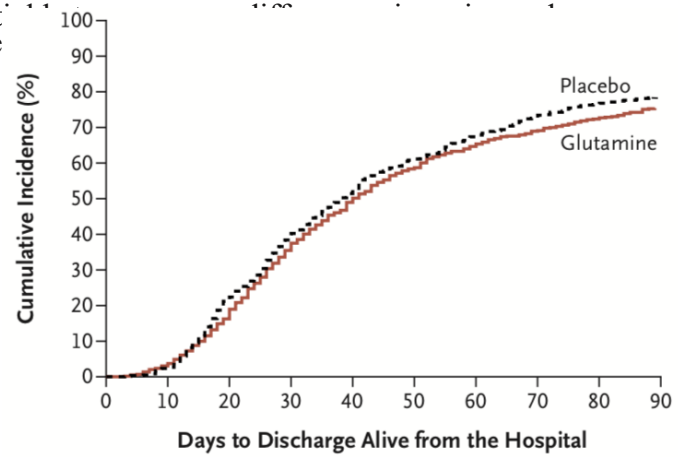
40 days (IQR 24-87) in the glutamine group and 38 days (IQR 22-75) in the placebo group (subdistribution hazard ratio for discharge alive, 0.91; 95% confidence interval [CI], 0.80 to 1.04; P=0.17).

Mortality at 6 months:

17.2% in the glutamine group

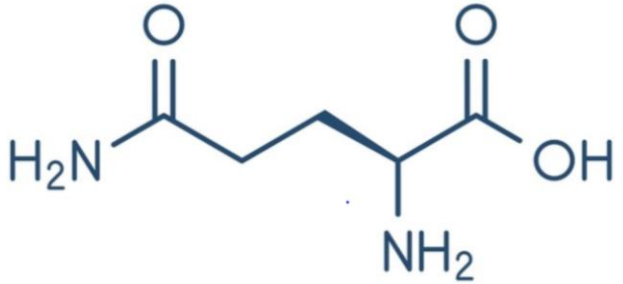
16.2% in the placebo group (hazard ratio for death, 1.06; 95% CI, 0.80 to 1.41).

No substant[illegible] events were



NEJM 2022;387:1001-1010

Glutamin



30) In patients with burns > 20% body surface area, additional enteral doses of GLN (0.3 - 0.5 g/kg/d) should be administered for 10 - 15 days as soon as EN is commenced. (R26, B, 95%)*

31) In critically ill trauma, additional EN doses of GLN (0.2 - 0.3 g/kg/d) can be administered for the first five days with EN. In case of complicated wound healing it can be administered for a longer period of 10 – 15 days. (R27, 0, 91%)

32) In ICU patients except burn and trauma patients, additional enteral GLN should not be administered. (R28, B, 92%)

33) In unstable and complex ICU patients, particularly in those suffering from liver and renal failure, parenteral GLN - dipeptide shall not be administered. (R29, A, 92%)

* recommendation to be revised in the near future

ESPEN 2023

Burns +

Trauma +

ESPEN Guidelines

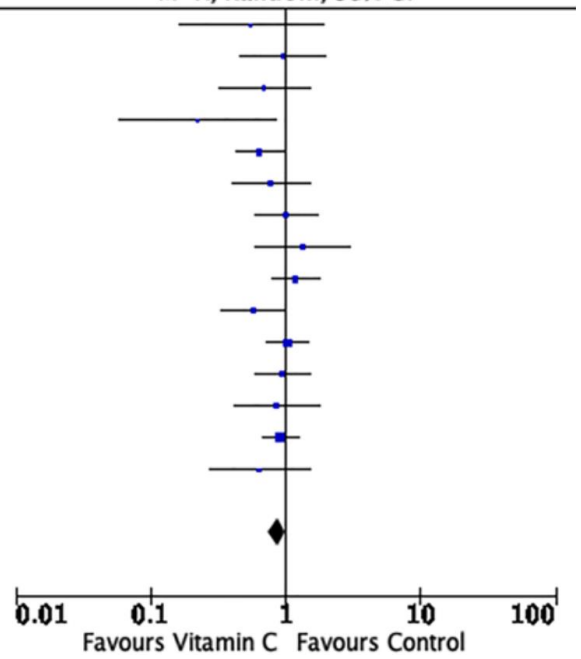
Højdosis vitamin C

≥ 10,000 mg/d

Study or Subgroup	Vitamin C Events	Vitamin C Total	Control (placebo or none) Events	Control (placebo or none) Total	Weight	Risk Ratio M-H, Random, 95% CI	Year
Nathens 2002	4	301	7	294	1.4%	0.56 [0.17, 1.89]	2002
Razmkon 2011	14	49	8	27	3.7%	0.96 [0.46, 2.00]	2011
Fowler 2014	7	16	5	8	3.4%	0.70 [0.32, 1.52]	2014
Zabet 2016	2	14	9	14	1.1%	0.22 [0.06, 0.85]	2016
Fowler 2019	25	84	38	82	11.5%	0.64 [0.43, 0.96]	2019
Chang 2020	11	40	14	40	4.6%	0.79 [0.41, 1.52]	2020
Fujii 2020	22	106	21	103	6.8%	1.02 [0.60, 1.73]	2020
Hwang 2020	11	53	9	58	3.1%	1.34 [0.60, 2.97]	2020
Moskowitz 2020	35	101	29	99	11.3%	1.18 [0.79, 1.78]	2020
Lv 2020	15	61	24	56	6.8%	0.57 [0.34, 0.98]	2020
Mohamed 2020	26	45	25	45	13.9%	1.04 [0.72, 1.49]	2020
Wani 2020	20	50	21	50	8.6%	0.95 [0.59, 1.52]	2020
Iglesias 2020	11	68	13	69	3.7%	0.86 [0.41, 1.78]	2020
Sevransky 2021	56	252	60	249	17.3%	0.92 [0.67, 1.27]	2021
Zhang 2021	6	27	10	29	2.7%	0.64 [0.27, 1.53]	2021
Total (95% CI)		1267		1223	100.0%	0.87 [0.75, 1.00]	
Total events	265		293				

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 14.83$, $df = 14$ ($P = 0.39$); $I^2 = 6\%$

Test for overall effect: $Z = 1.90$ ($P = 0.06$)



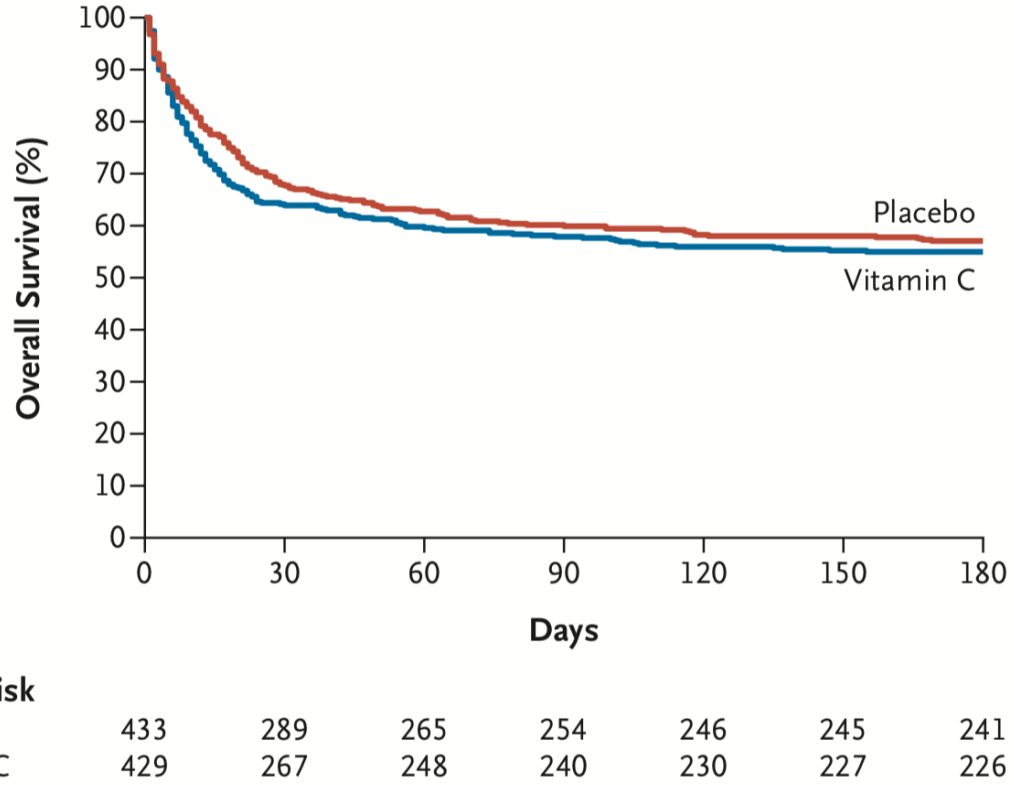
IV vitamin C administration appears safe and may be associated with a trend toward reduction in overall mortality.

High-dose IV vitamin C monotherapy may be associated with improved overall mortality.

Further randomized controlled trials are warranted.

CCM 2022 Mar 1;50(3)304-312

Højdosis vitamin C



No. at Risk							
Placebo	433	289	265	254	246	245	241
Vitamin C	429	267	248	240	230	227	226

LOVIT

In adults with sepsis receiving vasopressor therapy in the ICU, those who received intravenous vitamin C had a higher risk of death or persistent organ dysfunction at 28 days than those who received placebo

NEJM 2022;386:2387-98

Menger *et al. Critical Care* (2022) 26:268
https://doi.org/10.1186/s13054-022-04139-1

Critical Care

REVIEW Open Access

Administration of vitamin D and its metabolites in critically ill adult patients: an updated systematic review with meta-analysis of randomized controlled trials

Johannes Menger[1], Zheng-Yii Lee[2], Quirin Notz[1], Julia Wallqvist[3], M. Shahnaz Hasan[2], Gunnar Elke[4], Martin Dworschak[5], Patrick Meybohm[1], Daren K. Heyland[6] and Christian Stoppe[1,6*]

Abstract

Background: The clinical significance of vitamin D administration in critically ill patients remains inconclusive. The purpose of this systematic review with meta-analysis was to investigate the effect of vitamin D and its metabolites on major clinical outcomes in critically ill patients, including a subgroup analysis based on vitamin D status and route of vitamin D administration.

Methods: Major databases were searched through February 9, 2022. Randomized controlled trials of adult critically ill patients with an intervention group receiving vitamin D or its metabolites were included. Random-effect meta-analyses were performed to estimate the pooled risk ratio (dichotomized outcomes) or mean difference (continuous outcomes). Risk of bias assessment included the Cochrane tool for assessing risk of bias in randomized trials.

Results: Sixteen randomized clinical trials with 2449 patients were included. Vitamin D administration was associated with lower overall mortality (16 studies: risk ratio 0.78, 95% confidence interval 0.62–0.97, $p = 0.03$; $I^2 = 30\%$), reduced intensive care unit length of stay (12 studies: mean difference − 3.13 days, 95% CI − 5.36 to − 0.89, $n = 1250$, $p = 0.006$; $I^2 = 70\%$), and shorter duration of mechanical ventilation (9 studies: mean difference − 5.07 days, 95% CI − 7.42 to − 2.73, $n = 572$, $p < 0.0001$; $I^2 = 54\%$). Parenteral administration was associated with a greater effect on overall mortality than enteral administration (test of subgroup differences, $p = 0.04$), whereas studies of parenteral subgroups had lower quality. There were no subgroup differences based on baseline vitamin D levels.

Conclusions: Vitamin D supplementation in critically ill patients may reduce mortality. Parenteral administration might be associated with a greater impact on mortality. Heterogeneity and assessed certainty among the studies limits the generalizability of the results.

gh dosis
tamin D?

VITDALIZE (NCT03188796)

Europe, multicenter
Double-blind, placebo-controlled RCT
2400 (one interim analysis at 1200)
Loading dose of 540,000 IU vitamin D3 (orally, enteral)
Daily dose of 4000 IU vitamin D3 (orally, enteral) up to day 90
25(OH)D <12 ng/mL
Admission to ICU (all-cause)

28-day-mortality (all-cause)
October 2017
Recruiting, estimated completion date 2021–2022

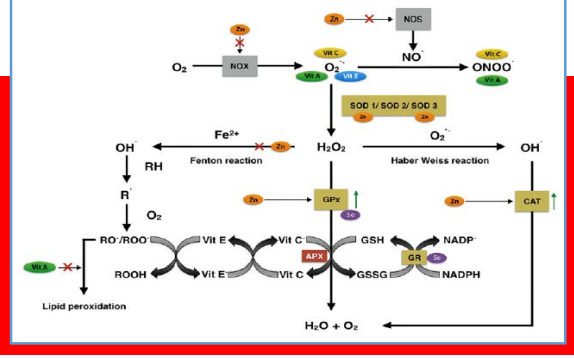
immunonutrition

- **Glutamin**
  - **Enteral eller parenteral glutamin som supplement til enteral ernæring anbefales ikke til kritisk syge.**
  - **Parenteral glutamin anbefales ikke til ustabile kritisk syge, især ikke til patienter med lever/nyresvigt/brandsår>20%.**
  - **Parenteral glutamin KUN til patienter med monoorgansvigt i form af tarmsvigt. Behandlingstiden er uvis.**

- **Omega 3-fedtsyrer**
  - **Kan ikke anbefales.**

- **Arginin, Immunonutrition cocktails**
  - **Kan ikke anbefales.**

Højdosis Antioxidanter vitaminer, sporstoffer



- Højdosis monoterapi med antioxidanter **SELENIUM** og **VITAMIN C** anbefales fortsat ikke.
- Vi kan ikke anbefale højdosis A/E/Z
- **ANTIOXIDANT COCKTAILS** anbefales ikke.

- ESPEN og DASAIM anbefaler at teste VITAMIN D hos langtidssyge patienter.
- D3 substitutionsdosis kan være 1400-2000 IE (35-50 µg) per dag.

vitaminer, minertaler, sporstoffer

Reduceret dosering

Parenteral administration:

Præparat	Parenteralt ernæret	Øvrige	Brandsår	CRRT	IHD
VITAMINER					
Vandopløselige	**1 ampul/døgn**	**1 ampul/døgn**	**1 ampul/døgn**	**1-2 ampuller/døgn***	**1 ampul/døgn**
Fedtopløselige	**1 ampul/døgn**	**1 ampul/døgn**	**1 ampul/døgn**	**1-2 ampuller/døgn***	**1 ampul/døgn**
B-combin Stærk		pn 2-4 ml/døgn	**6 ml/døgn**	**4 ml/døgn**	**1 ml/døgn**
Tiamin B1-vitamin		pn 2-400 mg/døgn	**100 mg/døgn**	**300 mg/døgn**	**100 mg/døgn**
Folinsyre B9-vitamin				**1 mg/døgn**	**1 mg/døgn**
Hydroxycobalamin vit. B12					**1 mg/MÅNED**
Askorbinsyre C-vitamin			**1000 mg/døgn**	**300 mg/døgn #**	**300 mg/2.døgn #**
MINERALER					
Magnesiumsulfat	pn 20-40 mmol/døgn	pn 20-40 mmol/døgn	pn 20-40 mmol/døgn	pn 20-40 mmol/døgn	pn 20-40 mmol/døgn
Fosfat	pn 10-60 mmol/døgn	pn 10-60 mmol/døgn*	pn 20-40 mmol/døgn	**20-40 mmol/døgn**	pn 20-40 mmol/døgn
SPORSTOFFER					
Konc. Tracel® / Nutryelt®	**1 ampul/døgn**	**1 ampul/døgn**	**1 ampul/døgn**	**1 ampul/døgn**	**1 ampul/døgn**
Zinksulfat	pn 150 µmol/døgn	pn 150 µmol/døgn	**450 µmol/døgn**	pn 150 µmol/døgn	pn 150 µmol/døgn
Selenium			**400 µg/døgn**	**150 µg/døgn**	

*2 ved CRRT+PN
#Undgå iv pga pris - Brug PO/EN

#Undgå iv pga pris - Brug PO/EN

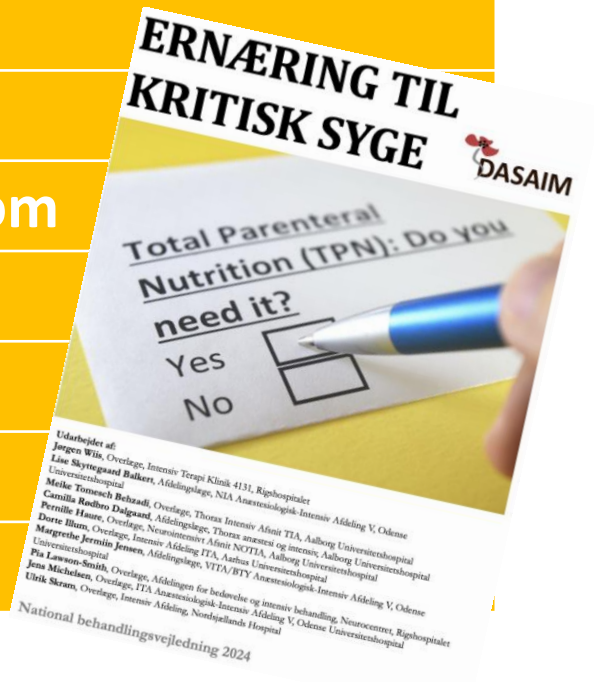
Oral/Enteral:

Præparat		Øvrige	Brandsår	CRRT	IHD
VITAMINER					
Multitabs		pn 1 tablet/døgn*	**1 tablet/døgn**	**1 tablet/døgn**	**1 tablet/døgn**
B-combin Stærk			**1 tablet/døgn**	**1 tablet/døgn**	**1 tablet/døgn**
Tiamin B1-vitamin			**150 mg/døgn**	**300 mg/døgn**	**150 mg/døgn**
Folinsyre B9-vitamin				**1 mg/døgn**	**1 mg/døgn**
Askorbinsyre C-vitamin			**1000 mg/døgn**	**250 mg/døgn**	**75 mg/døgn**
Cholecalciferol D3-Vitamin		pn 35-50 µg/døgn	pn 35-50 µg/døgn	pn 35-50 µg/døgn	pn 35-50 µg/døgn
MINERALER					
Magnesia, Mablet		pn 1 tablet x 3	pn 1 tablet x 3	pn 1 tablet x 3	pn 1 tablet x 3
Fosfat		pn 10-50 mmol/døgn*	pn 20-40 mmol/døgn	**20-40 mmol/døgn**	pn 20-40 mmol/døgn
SPORSTOFFER					
Solvezink 45mg = 2 Zinklet = 10 ml Zinksulfat		Pn (1stk/2stk/10ml) x 3	**(1stk/2stk/10ml) x 4**	**(1stk/2stk/10ml) x 3**	Pn (1stk/2stk/10ml) x3
Selen Organisk			**500 µg/døgn**	**100 µg/døgn**	

*Fast ved Refeeding

at få ernæringen til at fungere

- Enteral ernæring. Anlæggelse og kontrol af sonder, ventrikelretention, obstipation, diarré, fasteregler.
- Perorale/Enterale produkter
- Probiotika
- Parenteral ernæring, produkter og additiver
- Blodsukkerkontrol
- Ernæring ved malnutrition og refeeding syndrom
- Ernæring ved svær overvægt (BMI > 40)
- Ernæring til ældre
- Overgang til stationær afdeling
- Overordnet monitorering af ernæringsterapi



Monitorering af ernærings-terapi

Formål	Monitorering	Detaljer
Vurdering af evt ernæringsmæssige risikofaktorer	Screening	Refeeding, B-vitaminer? Ernæringsrisiko Beregning af ernæringsvægt
Beregning af ernæringsbehov, afhængigt af sygdomsfase	Energi: IC eller beregning Protein: Døgn U-karbamid/beregning	2 x ugtl: Døgnurin karbamid (til beregning af proteinbehov/N-balance)
Sikre, at patienten får den ordinerede ernæring	Ordination – art og mængde Indgift – art og mængde Årsager til evt fravigelse	 Fasteperioder
Opmærksomhed på evt bivirkninger/komplikationer til ernæringen	Klinik - GI-symptomer Laboratorieundersøgelser	Distension, smerter, diarré, obstipation, aspirater Dgl: Væsketal inkl. fosfat og magnesium. Fosfat evt hyppigere ved refeeding syndrom. Blodsukker hver 2.-4 t, specielt i opstartsfasen og ved ændringer i patientens tilstand og/eller ændringer i ernæringsindgift. 2 x ugtl: Levertal, Zink Se-triglycerid ved parenteral ernæring og større propofol doser.
At sikre, at den ernæringsterapi, der er planlagt på intensiv afdeling, kan ses og videreføres på stamafdeling eller andet sygehus.	Dokumentation i ernæringsmodul mundtlig overlevering evt kontakt til diætist	
At lette muligheden for evaluering af afdelingens ernæringspolitik	Audit	N-balance Beregning af ernæringsdeficit (planlagt indgift i forhold til faktisk) Vægt – siger mest om ernæringsstatus i rehabiliteringsfasen

BREAKING NEWS

ESPEN ALGORITMER 2023

Monitoring of medical nutrition

Monitor for tolerance, overfeeding and unterfeeding

Glucose and insulin

53) Blood glucose should be measured initially (after ICU admission or after artificial nutrition initiation) and at least every four hours, for the first two days in general. (R53, GPP, 93%)

54) Insulin shall be administered, when glucose levels exceed 10 mmol/L (R54, A, 93%)

EN feeding intolerance

55) In critically ill patients with gastric feeding intolerance, intravenous erythromycin should be used as a first line prokinetic therapy. (R13, B, 100%)

56) Alternatively, intravenous metoclopramide or a combination of meto-clopramide and erythromycin can be used as a prokinetic therapy. (R14, 0, 100%)

Monitor for refeeding

Electrolytes

57) Electrolytes (potassium, magnesium, phosphate) should be measured at least once daily for the first week. (R55, A, 93%)

Refeeding hypophosphatemia

58) In patients with refeeding hypophosphatemia (<0.65 mmol/L or a drop of >0.16 mmol/L), electrolytes should be measured 2 - 3 times a days and supplemented if needed. (R56, GPP, 92%)

59) In patients with refeeding hypophosphatemia energy supply should be restricted for 48 h and then gradually increased. (R57, B, 100%)

fungere

Start enteral ernæring
< 48 timer efter
indlæggelse på intensiv

1. Overvej kontraindikationer. Se boks
2. Kontroller sondeplacering
3. Bestem ernæringsmålrate i ml/t
4. Aspirer og replacer max 250 ml.

Start med 20 ml/t og kontroller aspiratet efter 8 timer

Aspirat >500 ml

JA

Replacer max 500 ml aspirat.
Hold pause i 2 timer.
Reducer infusionsraten med 20 ml/t.
Efter 8 timer kontolleres aspiratet

NEJ

Replacer aspiratet
Øg med 10-20 ml/t hver. 8. time
til målraten er nået
Kontroller aspiratet hver 8. time

Infusionsrate
≤ 20 ml/t

NEJ

JA

Fortsæt med 20 ml/t, kontroller aspiratet hver 8. time

Replacer max 500 ml.
START: Erythromycin 100 mg x 3 iv
Ingen effekt ? Suppler med metoclopramid 10 mg x 3 iv
OVERVEJ : Optimering af laxans
Opioidinduceret ventrikelretention ?
Methylnaltrexon, naloxon eller naloxegol
Ingen effekt ? OVERVEJ Duodenal/jejunal sonde

Kontraindikationer:

Ventrikelaspirat>500 ml
Ukontrolleret shock, hypoxi, hypercapni eller acidose
Øvre GI-blødning
Tarmiskæmi, Intestinal lækage/fistel
Abdominalt compartment syndrom

Enteral ernæring

fungere

Obstipation og diarre hos voksne ikke tarmopererede patienter på intensiv afdeling

DAG 1-3:

Start 10-15 dråber natriumpicosulfat x 1
+ 1 brev macrogol x 1

Afføring dag 3 ?

Ja → **Normal afføring**

Nej

DAG 4-6:

ØG laxantia:
15 dråber natriumpicosulfat x 2 + 2 breve Macrogol x 1

Ved hård fæces i ampullen:
Bisacodyl 10 mg x 1 mane + evt. 8 timer senere Fosfatklyx samme aften

Ved opioidinduceret obstipation:.
T. Naloxegol 12,5 -25 mg x 1-2, Naloxon 2-8 mg x 3 i sonden eller Methylnaltrexon 8-12 mg sc hver 2.dag

Afføring dag 6 ?

Nej

DAG 6 +:

Fortsæt hidtidige interventioner.
Overvej pause antikolinerge medikamenter.
Macrogol 1 brev i timen i 6 timer.
Olieklysma 250 ml i rectalsonde til natten
Ved tarmatoni: Neostigmin. OBS kontraindikationer

DIARRE: ≥3 flydende afføringer/dag
FORTSÆT SONDEERNÆRING

DAG 4-5:
Pauser laxantia
Overvej fiberholdigt EN

DAG 6:
Hvis obstipationsdiarre (hård fæces i ampullen) genoptages laxans
Afføring PCR for clostridier + andre patogene tarmbakterier

DAG 6 +:
Osmotisk diarre ? OBS sorbitolholdige medkamenter
Malabsorption ? Skift til peptid/MCT baseret EN
Pauser evt. antibiotika, Mg-holdige medikamenter
Overvej Loperamid
OBS iskæmisk eller inflammatorisk tarmssygdom

Shit happens a lot, or NOT

Gruppe	Navn	Dosis	Virkning	Obs
1. Osmotisk virkende	Macrogol Laktulose Sorbitol Magnesium/ elektrolyt-holdige præparater	1 br. x1-2	Øger tarmindholdets volumen og osmolaritet. Derved øges peristaltikken, og det medfører, at salt- og vandsekretionen i colon øges, hvorved fæces bliver løsere.	Nedsætter farmakas optag i tarmen => Giv aftendosis. Laktulose anvendes på special indikation (hepatisk encephalopati). Ikke som vanligt laxantia pga. risiko for dannelse af tarmluft og udspilet abdomen
2. Peristaltik fremmende	Bisacodyl Natrium-Picosulfat	15 mg rektalt 15 dr. x 1-2	Virker via nerve-plexerne til den glatte muskulatur i tarmvæggen. Øger tarmens peristaltik. Hæmmer absorptionen, øger sekretion af salt og vand i tarmen.	
3. Laksantia med effekt i rectum	Glycerol Fosfat	1 klyx x 1	Virker blødgørende på fæces og ved at fremkalde defækationsrefleks	
4. Opioid-antagonister	Methyl-naltrexon	12 mg sc. hver 2. d. Afhængig af vægt og nyre-funktion	Perifert virkende my-opioid receptor antagonist. Ophæver opioids effekt i gastrointestinal kanalen (ventrikeltømning, peristaltik og sekretion). Et positivt ladet (ved fysiologisk pH) kvarternært amin med lav fedtopløselighed. Passerer ikke en intakt blodhjerne barriere; ophæver ikke opioidets analgetiske effekt	Påvirker ikke QT-intervallet. Mulig effekt efter 30 min. Ikke i akut fase ved beskadiget blod-hjernebarriere. Kontraindiceret ved mistanke om gastro-intestinal obstruktion eller perforationsrisiko.
	Naloxegol	12,5-25 mg x1	Perifert virkende my-opioid receptor antagonist. Administreres som tabletter. Giv 2 timers ernæringspause inden. Passerer ikke en intakt blod-hjernebarriere.	Påvirker ikke QT-intervallet. Ikke ved ventrikelretention. Ikke i akut fase ved beskadiget blod-hjernebarriere.
	Naloxon	2-3 mg x3 Anvend iv-formu-leringen i sonden	My-opioidreceptor antagonist. Tertiær amin, fedtopløselig, passerer blodhjerne barrieren. Næsten 100% first pass effekt i leveren, naloxon kommer ikke i blodbanen, ophæver ikke opioidets analgetiske effekt. Virker efter 12-24 timer.	Påvirker ikke QT-intervallet. Ikke ved ventrikelretention, risiko for GI-obstruktion, perforation, cirrhose eller TIPS
5. Bulk-laksativa	Ex. frøskaller			Anbefales ikke til kritisk syge patienter, da det kræver indtag af en del vand
6.Neostigmin		Inf: 0,4 (-0,8) mg/t. Bolus: iv 0,25-0,5 mg x 4-6	Cholinesterasehæmmer, der kan anvendes ved tarmatoni	Skal konfereres m. kirurg. 24 t uden effekt: Stop. Kontraindikation: mistanke om GI-obstruktion. Giv altid 0,2 - 0,4 mg atropin eller 0,1 mg robinul for at undgå bradykardi

Laksantia Oversigt

Fastelavn stammer fra den katolske tid i Danmark. Inden påske skulle man faste i 40 dage, og fastelavnen var en fest, som blev holdt inden man gik ind til den strenge tid uden f.eks kød, fed mad og lækkerier.

www.natmus.dk

Continued enteral nutrition until extubation compared with fasting before extubation in patients in the intensive care unit: an open-label, cluster-randomised, parallel-group, non-inferiority trial

Mickaël Landais, Mai-Anh Nay*, Johann Auchabie*, Noemie Hubert, Aurélien Frerou, Aihem Yehia, Alain Mercat, Maud Jonas, Frédéric Martino, Mikael Moriconi, Anne Courte, Vincent Robert-Edan, Alexandre Conia, Florent Bavozet, Pierre-Yves Egreteau, Cédric Bruel, Anne Renault, Olivier Huet, Marc Feller, Nicolas Chudeau, Martine Ferrandiere, Anne Rebion, Alain Robert, Bruno Giraudeau, Jean Reignier, Arnaud W Thille, Elsa Tavernier, Stephan Ehrmann, on behalf of the REVA network and CRICS-TriggerSEP F-CRIN research network†*

Summary

Background Fasting is frequently imposed before extubation in patients in intensive care units, with the aim to reduce risk of aspiration. This unevaluated practice might delay extubation, increase workload, and reduce caloric intake. We aimed to compare continued enteral nutrition until extubation with fasting before extubation in patients in the intensive care unit.

Methods We conducted an open-label, cluster-randomised, parallel-group, non-inferiority trial in 22 intensive care units in France. Patients aged 18 years or older were eligible for enrolment if they had received invasive mechanical ventilation for at least 48 h in the intensive care unit and received prepyloric enteral nutrition for at least 24 h at the time of extubation decision. Centres were randomly assigned (1:1) to continued enteral nutrition until extubation or 6-h fasting with concomitant gastric suctioning before extubation, to be applied for all patients within the unit. Masking was not possible because of the nature of the trial. The primary outcome was extubation failure (composite criteria of reintubation or death) within 7 days after extubation, assessed in both the intention-to-treat and per-protocol populations. The non-inferiority margin was set at 10%. Pneumonia within 14 days of extubation was a key secondary endpoint. This trial is now complete and is registered with ClinicalTrials.gov, NCT03335345.

f a s t e or not

www.thelancet.com/respiratory Published online January 21, 2023

Patient karakteristika

	Continued enteral nutrition group (n=617)	Fasting group (n=513)
Age, years	61·7 (13·5)	64·1 (13·3)
Sex		
Female	199 (32·3%)	191 (37·2%)
Male	418 (67·7%)	322 (62·8%)
Simplified acute physiology score 2	50·9 (17·2)	49·9 (17·8)
Height, cm	168·5 (9·2)	168·8 (9·3)
Weight, kg	77·8 (19·5)	79·1 (19·2)
BMI, kg/m²	27·4 (6·6)	27·7 (6·3)
Type of admission		
Unscheduled surgical	69 (11·2%)	63 (12·3%)
Scheduled surgical	12 (1·9%)	28 (5·5%)
Medical	536 (86·9%)	422 (82·3%)
Charlson comorbidity index	4·4 (2·6)	4·6 (2·7)
Comorbidities		
Chronic obstructive pulmonary disease	89 (14·4%)	65 (12·7%)
Asthma	28 (4·5%)	32 (6·2%)
Obesity hypoventilation syndrome	24 (3·9%)	19 (3·7%)
Obstructive sleep apnoea syndrome requiring continuous positive pressure therapy	39 (6·3%)	45 (8·8%)
Long-term oxygen therapy	6 (1·0%)	12 (2·3%)
Non-invasive ventilation at home	8 (1·3%)	6 (1·2%)
Left ventricular dysfunction	41 (7·0%)	32 (7·1%)
Ischaemic heart disease	85 (13·8%)	69 (13·5%)
Atrial fibrillation	67 (10·9%)	66 (12·9%)
History of cardiogenic pulmonary oedema	20 (3·2%)	19 (3·7%)
Severe valvular heart disease	13 (2·2%)	34 (7·3%)
Cough evaluation		
Ineffective	10 (1·7%)	36 (7·5%)
Weak	102 (17·0%)	125 (25·9%)
Effective	407 (67·7%)	281 (58·2%)
Very effective	82 (13·6%)	41 (8·5%)
Tracheal secretion evaluation		
Absent	26 (4·3%)	34 (6·8%)
Low abundance	321 (53·1%)	247 (49·2%)
Abundant	219 (36·3%)	190 (37·8%)
Great abundance	38 (6·3%)	31 (6·2%)
Respiratory physiotherapy	201 (32·8%)	137 (28·1%)
Risk factors of extubation failure†		
0	400 (64·8%)	316 (61·6%)
≥1	217 (35·2%)	197 (38·4%)
Median volume of enteral intake 6 h before extubation, mL (IQR)	375 (252–438)	0
Median volume of gastric contents suctioned 6 h before extubation, mL (IQR)	0	20 (2–200)
Median duration of invasive mechanical ventilation before extubation, days (IQR)‡	8·4 (5·4–13·4)	8·3 (5·3–12·4)

Hovedresultater

	Continued enteral nutrition group (n=617)	Fasting group (n=513)
Primary outcome		
Extubation failure within 7 days after extubation†	106 (17·2%)	90 (17·5%)
Secondary outcomes		
Nosocomial pneumonia‡	10 (1·6%)	13 (2·5%)
Duration from the first successful spontaneous breathing trial to extubation, h§	2·0 (1·0 to 4·4)	17·6 (3·4 to 26·8)
Duration from the first successful spontaneous breathing trial to intensive care unit discharge, days¶	4·0 (2·0 to 8·0)	6·6 (3·0 to 11·1)

Faste eller ej?
NBV 2024

Vi anbefaler, at patienter, der er vurderet klar til extubation på intensiv,

som ikke har tegn på ventrikelretention,
vurderes at have sufficient hostekraft og
ikke for nyligt er abdominalt opererede

ikke behøver at faste før extubation

"Men det er en lægelig vurdering"

Kostfibre, til kritisk syge?

ASPEN/SCCM 2016/2021:

1) Provide soluble fiber for hemodynamically stable critical patients who develop diarrhea
2) Recommend AGAINST the use of insoluble fiber
3) Avoid any type of fiber in patients with severe motility impairment and highrisk for mesenteriel ischemia
4) JPEN 2016;40(2):159-21 / 2022;46:12–41

ESPEN 2023: Not addressed. Clin Nutr 2023;42:1671-89

DASAIM 2023:

Produkter med opløselige fiber øger vandvolumen i tarmen, fremmer produktion af SCFA og gør afføringen blødere. Denne effekt kan hjælpe ved obstipation. Uopløselige fiber forkorter tiden af passagen af afføring gennem tarmen. Vi anbefaler ikke anvendelse af produkter med uopløselige fibre

Ved patienter med diarre kan man forsøge fiberrige ernæringsprodukter til forbedring af tarmfloraen

Fiberrige sondemadsprodukter frarådes ved hæmodynamisk ustabile patienter og ved tarmiskæmi

Behandling med probiotika anbefales ikke til kritisk syge voksne patienter.
Fæcestransplantation bør overvejes ved multiresistent Cl. Difficile infektion.

Early and sustained *Lactobacillus plantarum* probiotic therapy in critical illness: the randomised, placebo-controlled, restoration of gut microflora in critical illness trial (ROCIT)

Outcome	Probiotics ($n = 110$)	Placebo ($n = 108$)	Median difference (95% CI)	Unadjusted odds ratio (95% CI)	*P* value
Primary outcome					
Days alive and out of hospital to Day 60—median days (IQR)	49.5(37–53)	49(43.8–53)	0 (− 6.1 to 7.1)		0.55
$DAOH_{60}$ components to Day 60					
Mortality —no. (%)	6 (5.45)	5 (4.6)		1.19 (0.4–4)	1.00
Days out of hospital amongst survivors ($n = 207$)—median days (IQR)	50 (40.8–53)	50 (45–3.5)	0 (− 3.4 to 4.9)		0.59
$DAOH_{60}$ amongst participants with ≥ 80% compliance ($n = 182$)—median days (IQR)	49 (36.5–53)	50 (45–54)	− 1 (− 5.1 to 7.1)		0.36
Secondary outcomes					
Nosocomial infection—no. (%)	8 (7.3)	5 (4.6)		1.62 (0.51–5.1)	0.57
Antibiotic-free days—median days (IQR)	53 (48–58)	54 (49–58)	− 1 (− 3.1 to 4.1)		0.46
ICU mortality – no. (%)	4 (3.6)	4 (3.7)		0.98 (0.24–4.03)	1.00
Hospital mortality—no. (%)	5 (4.6)	4 (3.7)		1.24 (0.32–4.74)	1.00
EQ-5D-5L VAS Overall health state ($n = 195$)—median score (IQR)	75 (60–85)	76 (60–90)	− 1.0 (− 14.5 to 16.3)		0.39
EQ-5D-5L Utility index—median (IQR)	0.81 (0.57–1)	0.78 (0.56–1)	0.02 (− 0.07 to 0.07)		0.96

Multicentre, parallel group, PCRCT.
Adults within 48 h of ICU admission, expected to require ICU care beyond the day after recruitment.

L plantarum 299v or placebo continued for 60 days.
Primary outcome:

Day 60 (DAOH60).
Secondary outcomes included nosocomial infections.

Take-home message

Early and sustained probiotic administration to adult patients requiring treatment in the intensive care is safe but ineffective in improving outcomes or reducing nosocomial infection. Whether more targeted therapy is beneficial remains uncertain.

Intensive Care Med 2021

BS – BMI>30 – De ældre – Ernæring efter

Blodsukkerniveau 6 – 10 mmol/l anbefales

~~**Blodsukkerniveau på 10 – 14 mmol/l accepteres til patienter med forudbestående diabetes mellitus**~~

~~**Kritisk syge patienter med diabetes mellitus behandles ernæringsmæssigt som øvrige patienter**~~

Overvægtige er en meget heterogen gruppe hvad angår muskelmasse og metabolisme

Hospitalsindlagte overvægtige patienter har høj risiko for malnutrition

Overvægtige har samme energi- og proteinbehov per kg ernæringsvægt som normalvægtige

Overvægtige kritisk syge skal behandles med samme ernæringsprodukter som normalvægtige

Det anbefales at følge de generelle retningslinjer for ernæring til kritiske syge patienter

Vi er alle del af patientens ernæringsteam

Vi har ansvar for, at det postintensive ernæringsforløb er bedst muligt

BlodSukkerkontrol

Blodsukker niveau

Anbefaler blodsukkermål hos kritisk syge intensive patienter på 6-10 mmol/l.

BG-mål 6-10 mmol/l

Hypoglykæmi under insulinbehandling

Pause vanlig anti-diabetesmedicin.
Omlægning af s.c langtidsvirkende basal insulin til hurtigtvirkende intravenøs basalinsulin, som anses som minimumdosis.

Administration

Hurtigtvirkende insulin bør administreres som PN-dosis eller infusion.

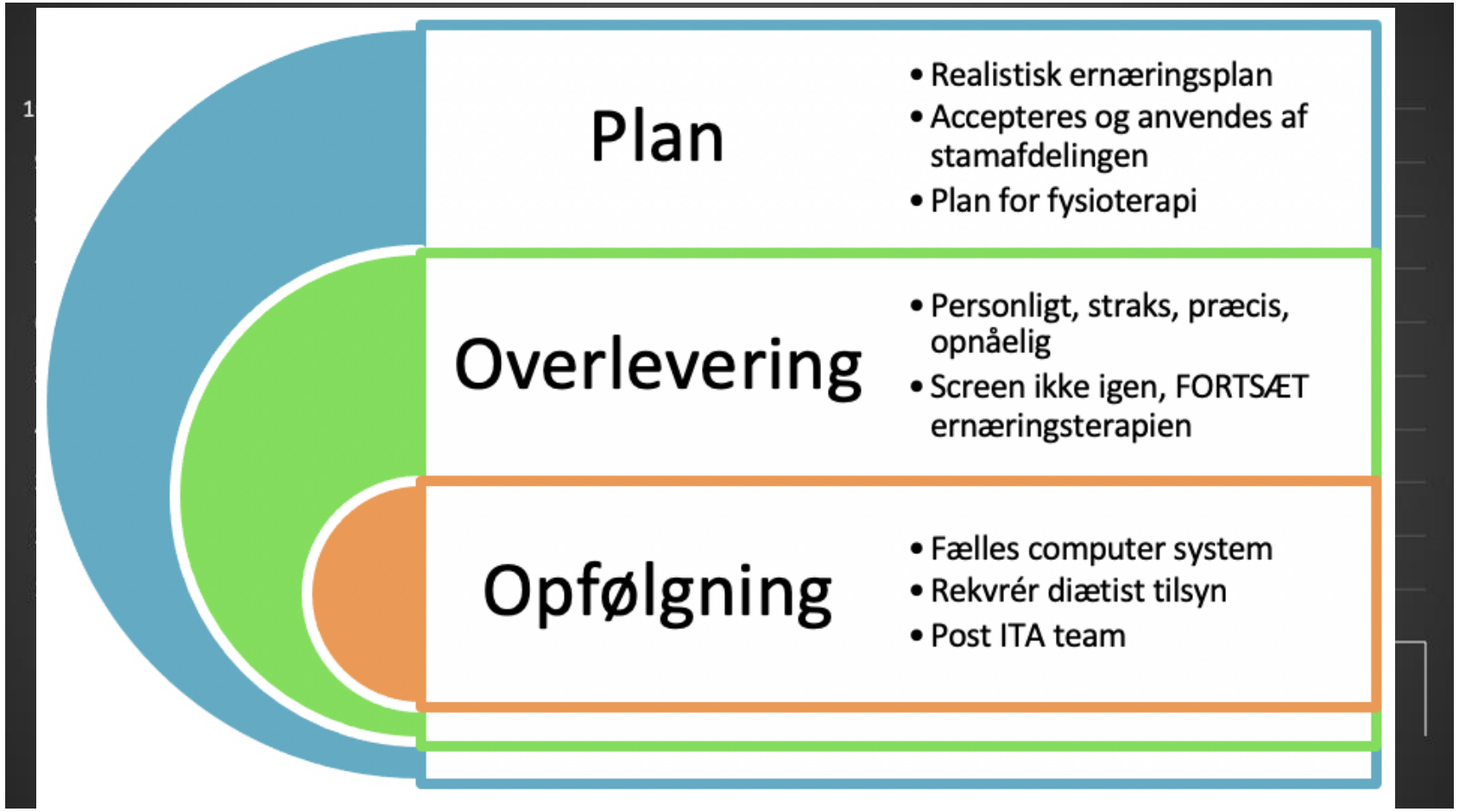
Målehyppighed og metode

Ketonbestemmelse

Ernæring og insulinterapi

Overgang fra intensiv til stamafdeling

Overgang til stationær afdeling



Wiis. Nutrition gap after discharge from maximized intensive care nutritional therapy. Clnical Nutrition, ESPEN. Abstract, 2021; 46:550-51

ESPEN ALGORITMER 2023

Medical nutrition in special cases

The non-intubated patient

41) In non-intubated patients not reaching the energy target with an oral diet, oral nutritional supplements should be considered first and then EN. (R41, GPP, 96%)

42) In non-intubated patients with dysphagia, texture-adapted food can be considered. If swallowing is proven unsafe, EN should be administered. (R42, GPP, 94%)

43) In non-intubated patients with dysphagia and a very high aspiration risk, postpyloric EN or, if not possible, temporary PN during swallowing training with removed nasoenteral tube can be performed. (R43, GPP, 92%)

The surgical patient

44) In patients after abdominal or esophageal surgery, early EN can be preferred over delayed EN. (R45, 0, 96%)

45) In critically ill patients with surgical complications after abdominal or esophageal surgery and unable to eat orally, EN (rather than PN) should be preferred unless discontinuity or obstruction of GI tract, or abdominal compartment syndrome is present. (R46, GPP, 96%)

46) In the case of an unrepaired anasto-motic leak, internal or external fistula, a feeding access distal to the defect should be aimed for to administer EN. (R47, GPP, 96%)

47) In the case of an unrepaired anastomotic leak, internal or external fistula, or if distal feeding access is not achieved, EN should be withheld and PN may be commenced. (R48, GPP, 100%)

48) In case of high output stoma or fistula, the appropriateness of chyme reinfusion or enteroclysis should be evaluated and performed if adequate. (R49, GPP, 100%)

The trauma patient

49) Trauma patients should preferentially receive early EN instead early PN. (R50, B, 96%)

The septic patient

50) Early and progressive EN should be used in septic patients after hemodynamic stabilization.
If contraindicated, EN should be replaced or supplemented by progressive PN. (R44, GPP, 94%)

The obese patient

51) An iso-caloric high protein diet can be administered to obese patients, preferentially guided by indirect calorimetry measurements and urinary nitrogen losses. (R51, 0, 89%)

52) In obese patients, energy intake should be guided by indirect calorimetry.
Protein delivery should be guided by urinary nitrogen losses or lean body mass determination (using computerized tomography or other tools).
If indirect calorimetry is not available, energy intake can be based on “adjusted body weight”.
If urinary nitrogen losses or lean body mass determination are not available, protein intake can be 1.3 g/kg “adjusted body weight”/d. (R52, GPP, 89%)

Ernæring ved specifikt organsvigt

- **Tarmsvigt, herunder korttarmssyndrom**
- **Leversygdomme**
- **Akut pankreatit**
- **Lungesvigt**
  - KOL
  - ARDS
  - ECMO
- **Nyresvigt**
- **Traume**
- **Kritisk neurokirurgisk sygdom**
  - TBI, SAH og ICH
  - Cervikalt medullært tværsnitssyndrom
- **Ernæring ved brandsår**

Tag med hjem

Ernæring til den kritisk syge

- ✓2 nyere internationale guideline mere relevante, men fortsat behov for praksisnær vejledning
- ✓Algoritmer er i fokus, men ernæring til kritisk syge skal være differentieret, behovsrelateret og målrettet med udgangspunkt i sygdomsfaser, patientens vægt, konstitution, akut sygelighed og risiko for under- OG overernæring.

Risiko for underernæring	**Moderat, 2 af følgende**	**Svær, 2 af følgende**
Vægttab	5 – 10 % indenfor 6 måneder	> 10 % indenfor 6 måneder
BMI ifht alder år	≤70 år: BMI<20, >70 år: BMI<22	≤70 år: BMI<18.5, >70 år: BMI<20
Kostindtag / Tarmfunktion	Nedsat >2 uger / Noget nedsat	<50 % i > 1 uge / Svært nedsat
Dage på hospital før ITA	> 1 dag	> 7 dage
Sygdomsbyrde, kronisk	Kræft, lunge/lever/nyre-syg	
Sygdomsbyrde, akut		1 af flg: Brandsår, neurokir. traume
Risiko for overernæring	**Moderat**	**Svær**
Sepsis, inflammation, MOF	CRP 50-100 og MOF	CRP>100 og MOF, akut nyresvigt

- ✓ Maj 2024: dasaim.dk/guides/pdf-nbv-ernaering-til-kritisk-syge

REGION SJÆLLAND
SJÆLLANDS UNIVERSITETSHOSPITAL
– vi er til for dig

DSKE
DANSK SELSKAB for KLINISK ERNÆRING

PROGRAM

16.00 Velkomst
Ines Raben, Klinisk Diætist, Cand. scient Medicinsk Afdeling, Sjælland Universitets Hospital Køge og Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

16.10 Patienten i ernæringsrisiko
Mette Holst, Professor, Ph.D., og Henrik Højgaard Rasmussen, Overlæge, Professor, Center for Ernæring og Tarmsvigt, Aalborg Universitets Hospital

16.40 Ernæring til den kritisk syge patient – opdaterede guidelines
Jørgen Wiis, Overlæge, EDIC, Afdeling for Intensiv behandling 4131, Center for kræft og organsygdomme, Rigshospitalet

17.10 – 17:20 Pause

PROGRAM

17.20 Ernæring til den kirurgiske risiko patient
Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

17.40 Indsats i forhold til ernæringsrisiko og dehydrering i akutmodtagelsen (NYT-I-AMA)
Martine K. Nielsen, Klinisk Diætist, Cand.scient, Emma D.M. Pedersen, Klinisk Diætist og Anne Marie Beck, seniorforsker, klinisk diætist, Ph.D., EATEN, Herlev Gentofte Universitetshospital

18.10 Afrunding og fremtidige DSKE arrangementer

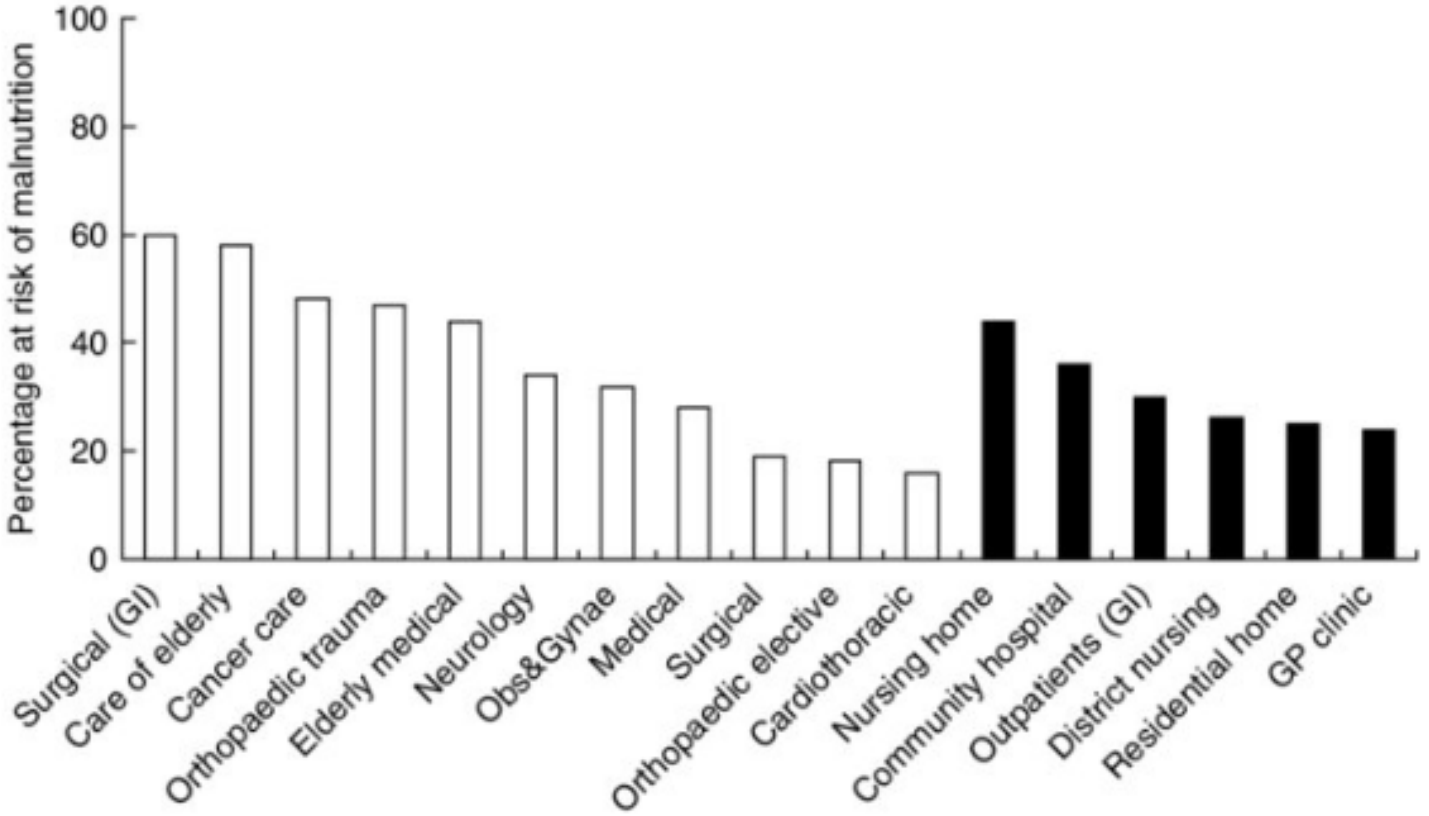
18.15 Let traktement og networking

CENTER FOR SURGICAL SCIENCE

ERNÆRING TIL DEN KIRURGISKE RISIKO PATIENT

HVOR MANGE ER I ERNÆRINGSMÆSSIG RISIKO?

CENTER FOR SURGICAL SCIENCE



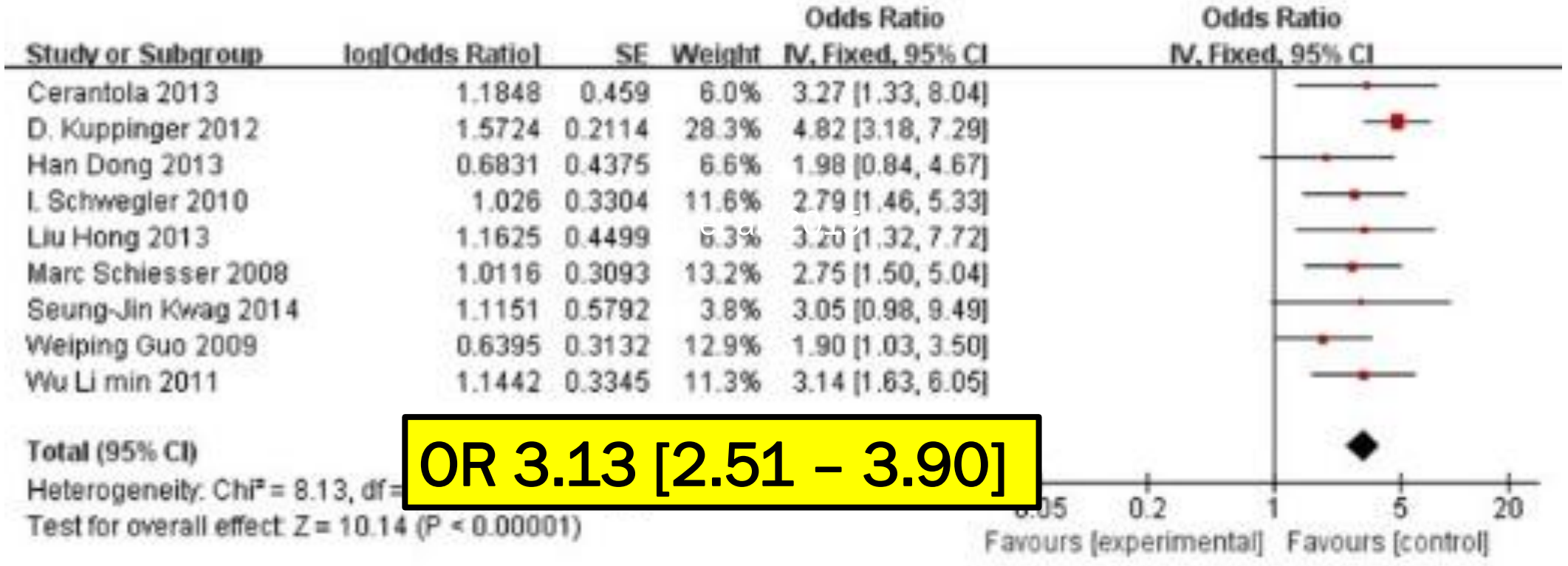
MUST ≥ 1

Stratton R.:Proceedings of the Nutrition Society (2005), 64, 305–311

FEJLERNÆRINGS INDFLYDELSE PÅ KOMPLIKATIONER

CENTER FOR SURGICAL SCIENCE

NRS 2002 - screening

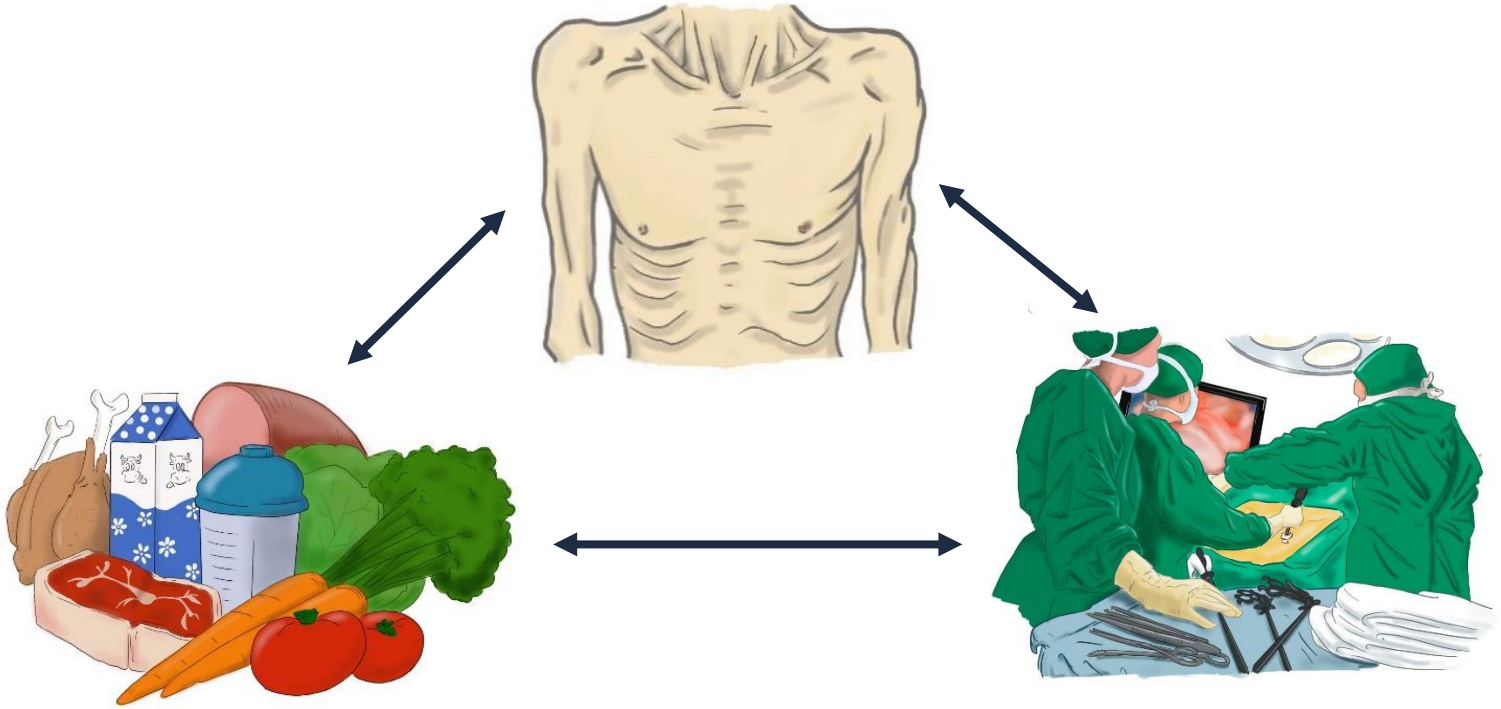


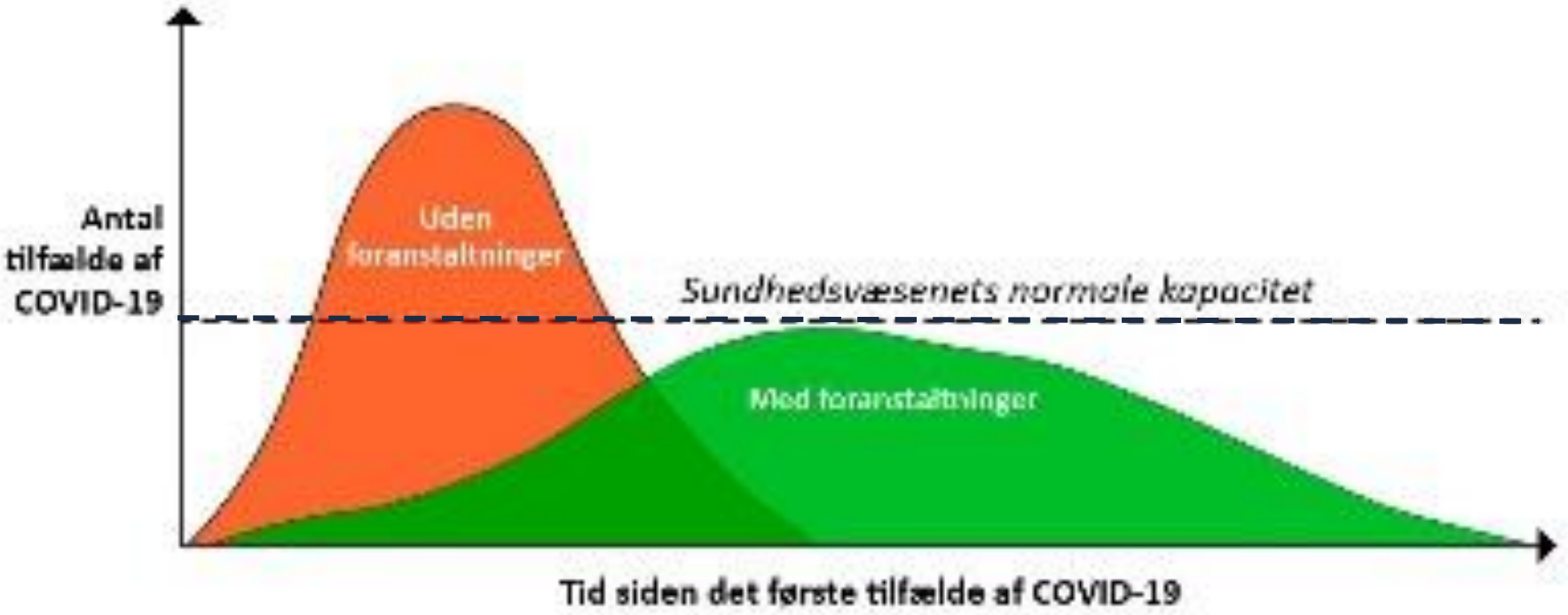
n = 3527

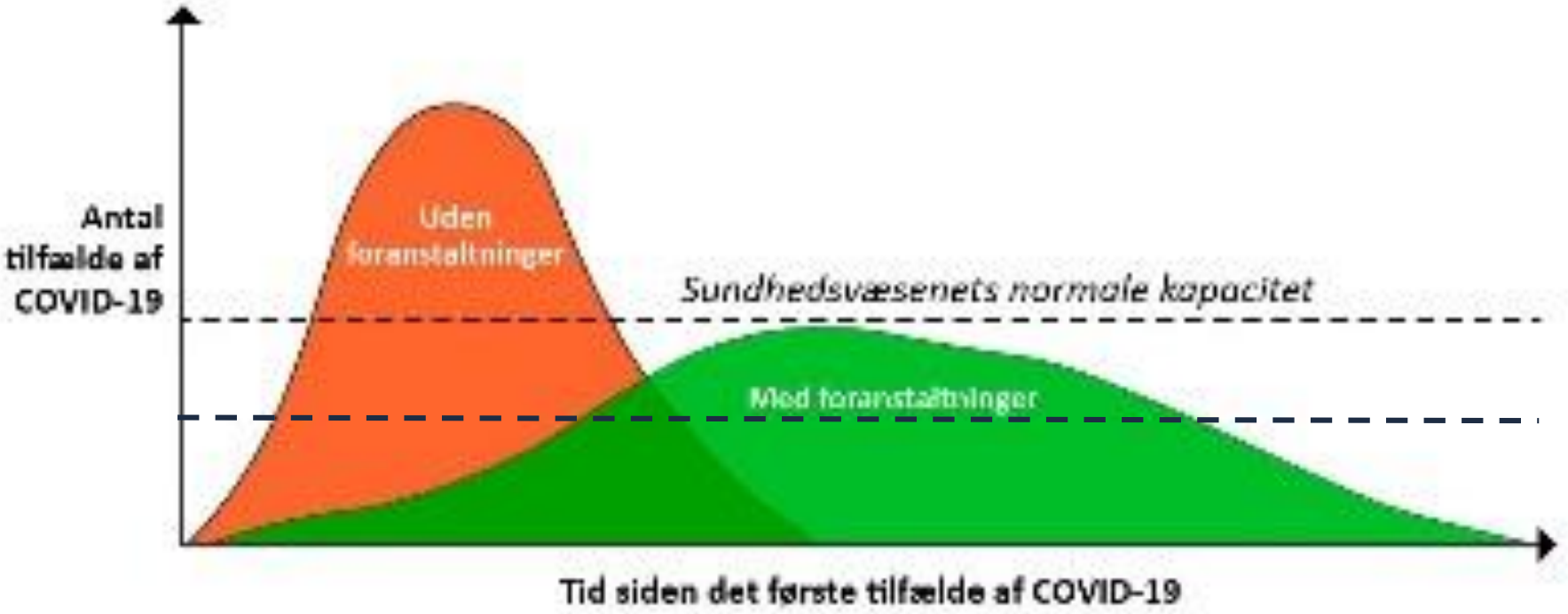
Su et al. 2015 • DOI: 10.1371/journal.pone.0132857

HVEM ER DEN KIRURGISKE RISIKO PATIENT? - ERNÆRINGSMÆSSIGT

CENTER FOR SURGICAL SCIENCE

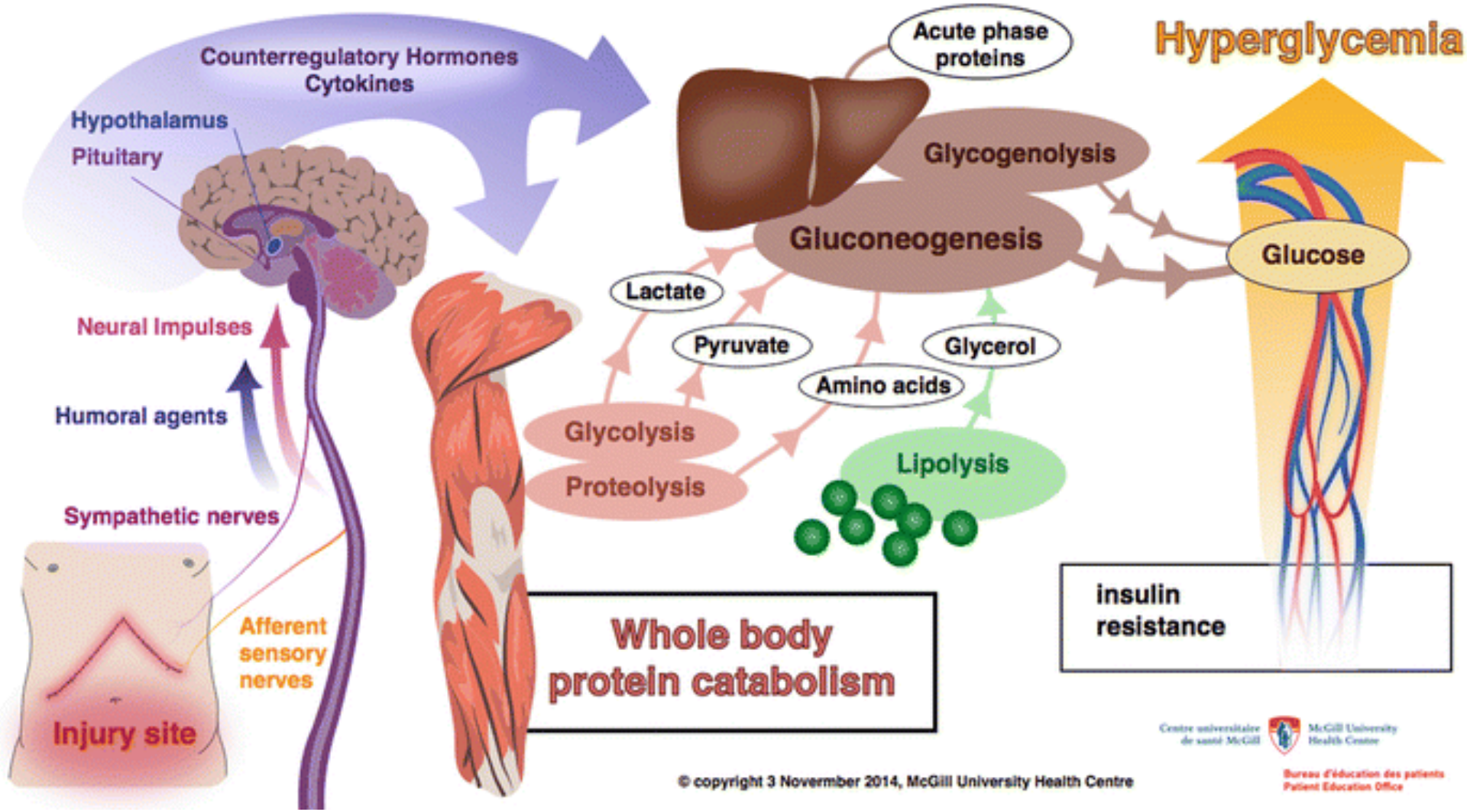



Antal tilfælde af COVID-19
Uden foranstaltninger
Sundhedsvæsenets normale kapacitet
Med foranstaltninger
Tid siden det første tilfælde af COVID-19

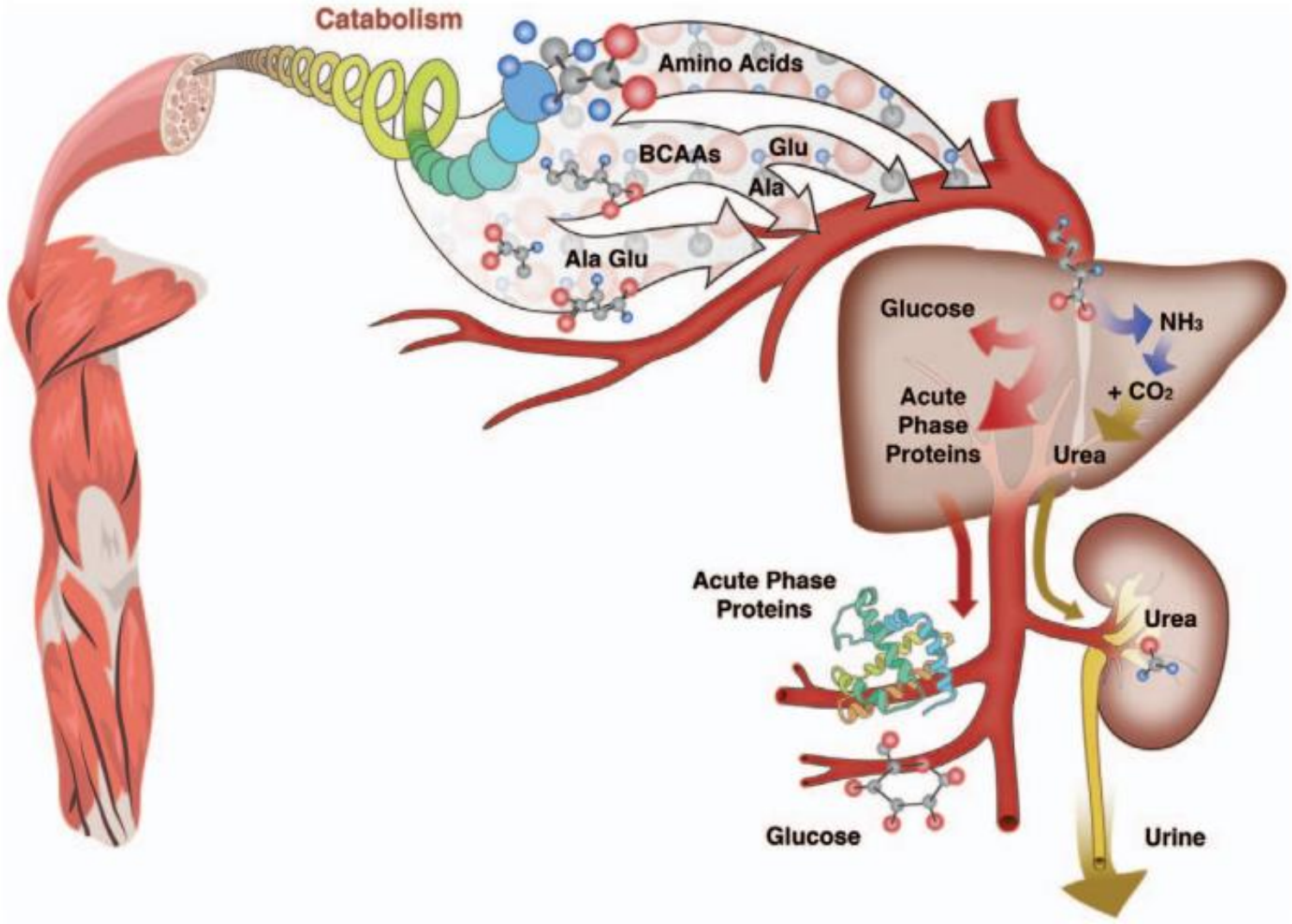

Antal tilfælde af COVID-19
Uden foranstaltninger
Sundhedsvæsenets normale kapacitet
Med foranstaltninger
Tid siden det første tilfælde af COVID-19

Det kirurgiske stress respons

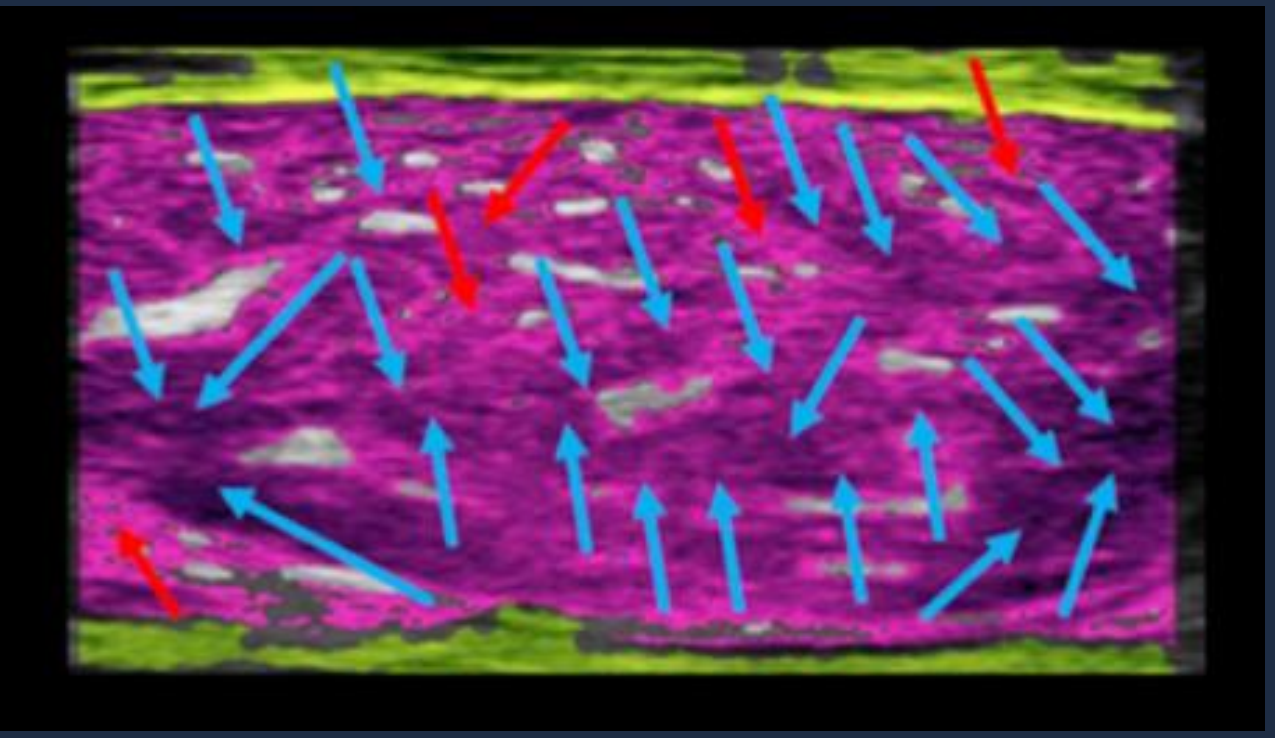
CENTER FOR SURGICAL SCIENCE



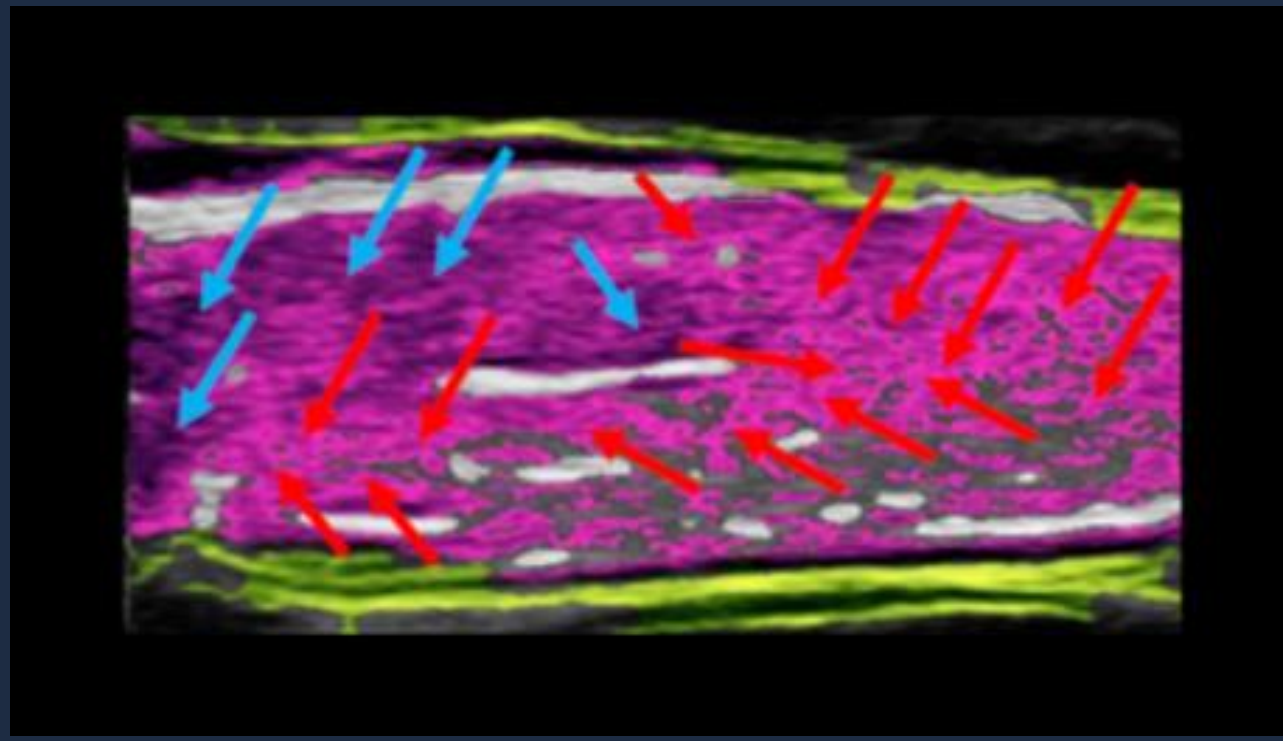
Det kirurgiske stress respons



Det kirurgiske stress respons



Indlæggelse på ITA



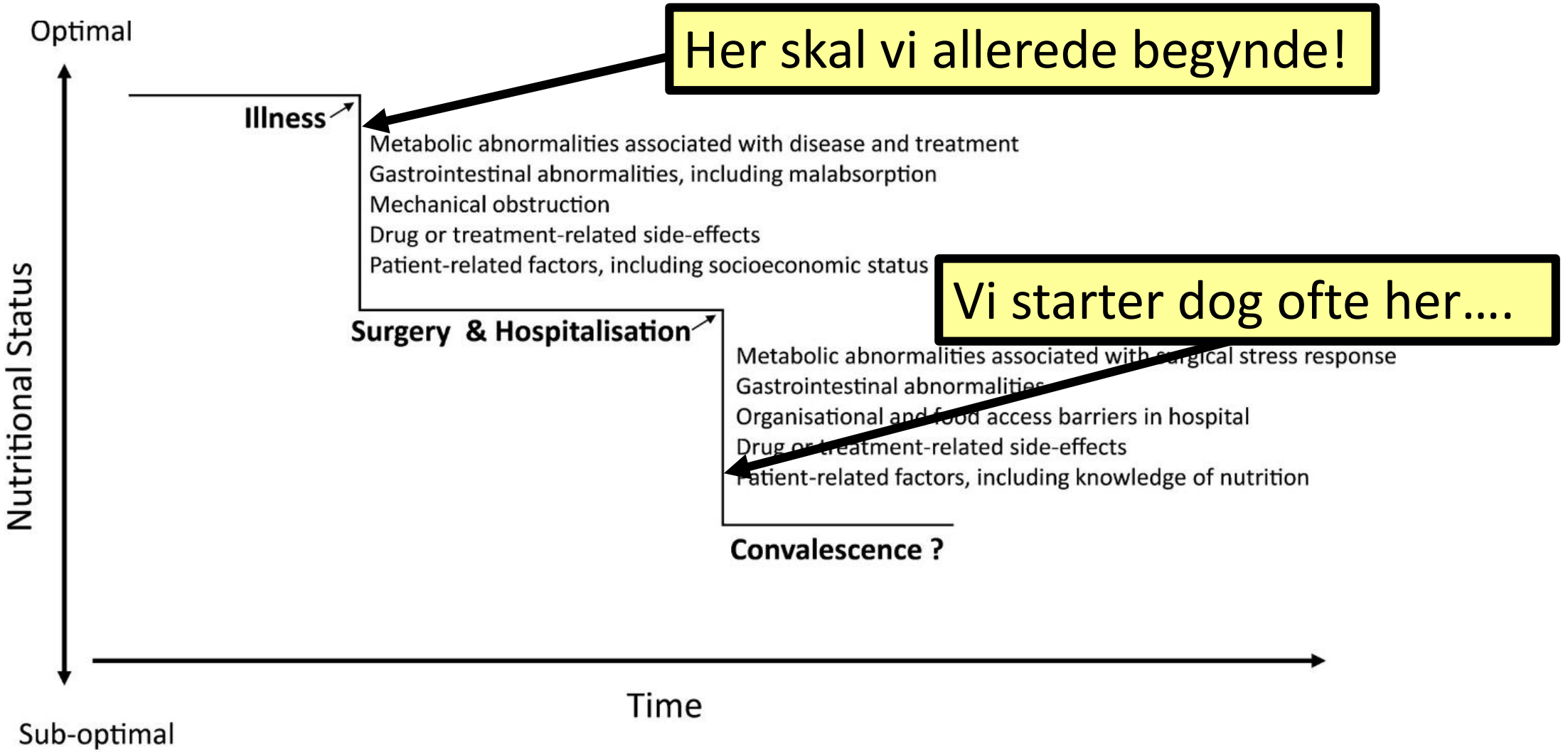
… 10 dage senere

Rectus femoris: Lilla farve: Højt glykogen indhold, lyserød: lavt glykogen indhold

Williams et al. Curr Opin Anaesthesiol. 2019 Jun; 32(3): 405–411.

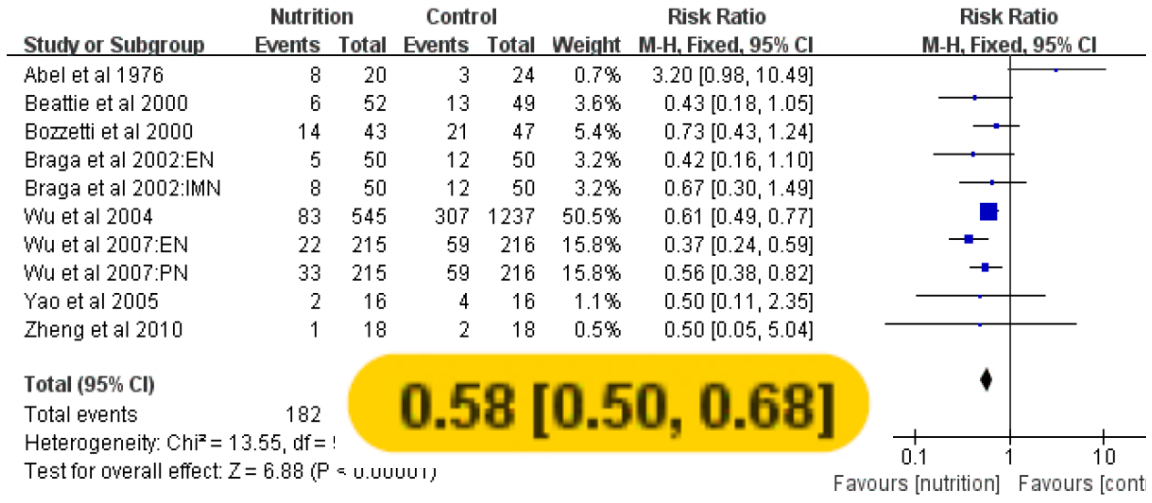
FEJLERNÆRING HOS DEN KIRURGISK PATIENT

CENTER FOR SURGICAL SCIENCE



Gillis et al. Anaestehisia 2019 : https://doi.org/10.1111/anae.14506

RR VED ERNÆRINGSINTERVENTION



Study or Subgroup	Nutrition Events	Nutrition Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Abel et al 1976	8	20	3	24	0.7%	3.20 [0.98, 10.49]
Beattie et al 2000	6	52	13	49	3.6%	0.43 [0.18, 1.05]
Bozzetti et al 2000	14	43	21	47	5.4%	0.73 [0.43, 1.24]
Braga et al 2002:EN	5	50	12	50	3.2%	0.42 [0.16, 1.10]
Braga et al 2002:IMN	8	50	12	50	3.2%	0.67 [0.30, 1.49]
Wu et al 2004	83	545	307	1237	50.5%	0.61 [0.49, 0.77]
Wu et al 2007:EN	22	215	59	216	15.8%	0.37 [0.24, 0.59]
Wu et al 2007:PN	33	215	59	216	15.8%	0.56 [0.38, 0.82]
Yao et al 2005	2	16	4	16	1.1%	0.50 [0.11, 2.35]
Zheng et al 2010	1	18	2	18	0.5%	0.50 [0.05, 5.04]
Total (95% CI)						**0.58 [0.50, 0.68]**
Total events	182					

Heterogeneity: Chi² = 13.55, df = 9

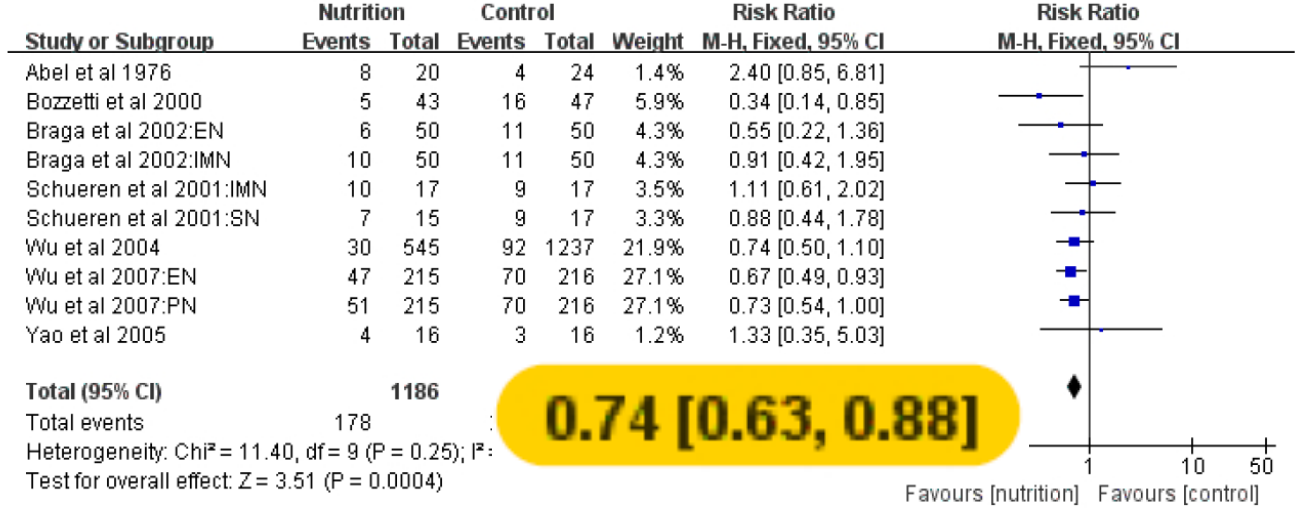
Test for overall effect: Z = 6.88 (P < 0.00001)

Risk Ratio M-H, Fixed, 95% CI

0.1 1 10

Favours [nutrition] Favours [cont

Infektiøse komplikationer



Study or Subgroup	Nutrition Events	Nutrition Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Abel et al 1976	8	20	4	24	1.4%	2.40 [0.85, 6.81]
Bozzetti et al 2000	5	43	16	47	5.9%	0.34 [0.14, 0.85]
Braga et al 2002:EN	6	50	11	50	4.3%	0.55 [0.22, 1.36]
Braga et al 2002:IMN	10	50	11	50	4.3%	0.91 [0.42, 1.95]
Schueren et al 2001:IMN	10	17	9	17	3.5%	1.11 [0.61, 2.02]
Schueren et al 2001:SN	7	15	9	17	3.3%	0.88 [0.44, 1.78]
Wu et al 2004	30	545	92	1237	21.9%	0.74 [0.50, 1.10]
Wu et al 2007:EN	47	215	70	216	27.1%	0.67 [0.49, 0.93]
Wu et al 2007:PN	51	215	70	216	27.1%	0.73 [0.54, 1.00]
Yao et al 2005	4	16	3	16	1.2%	1.33 [0.35, 5.03]
Total (95% CI)		**1186**				**0.74 [0.63, 0.88]**
Total events	178					

Heterogeneity: Chi² = 11.40, df = 9 (P = 0.25); I²

Test for overall effect: Z = 3.51 (P = 0.0004)

Risk Ratio M-H, Fixed, 95% CI

1 10 50

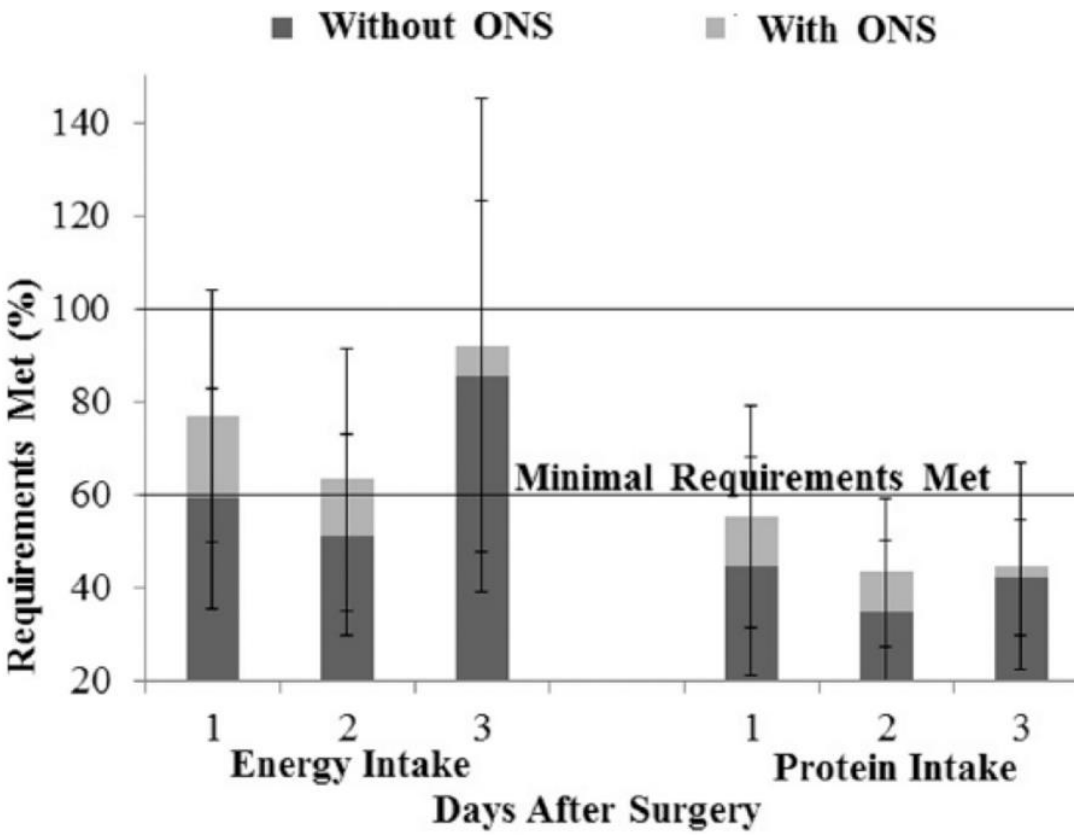
Favours [nutrition] Favours [control]

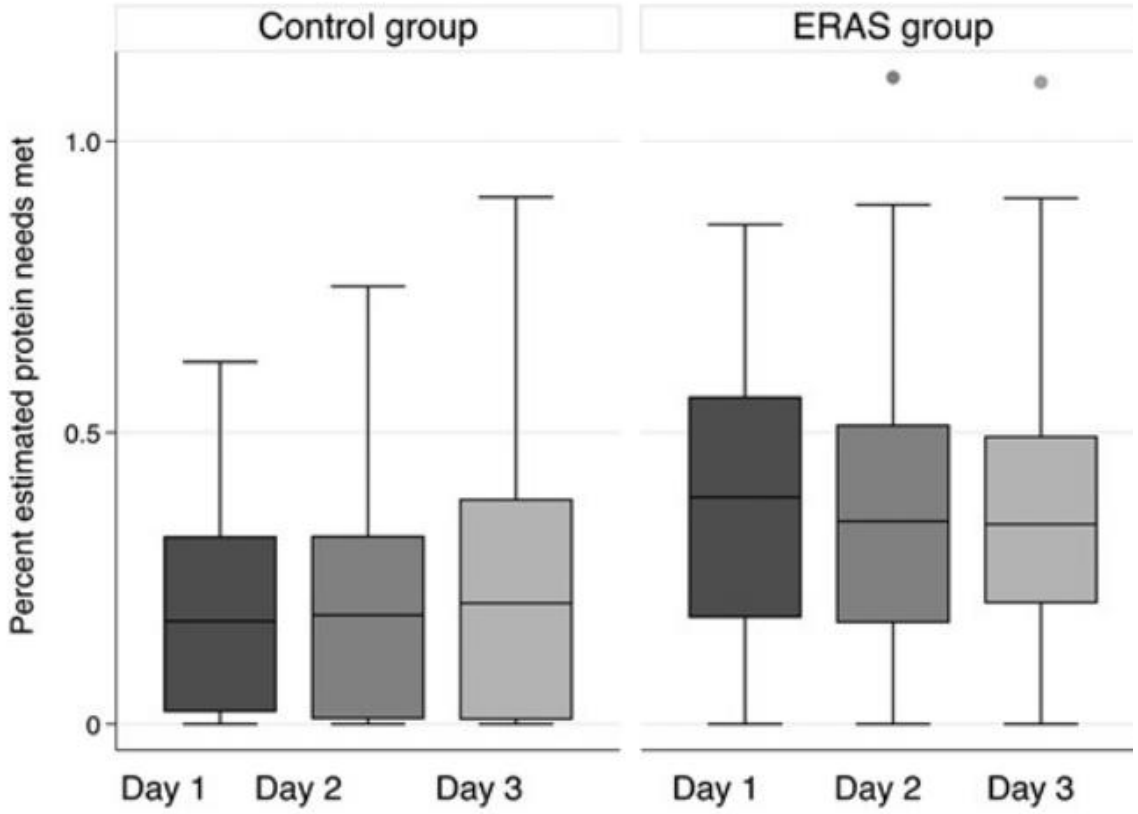
Non infektiøse komplikationer

Meta analyse 3831 patienter i RCT´ér

Zhong et al. Asia Pac J Clin Nutr 2015;24(3):367-378

POST OPERATIV ERNÆRING



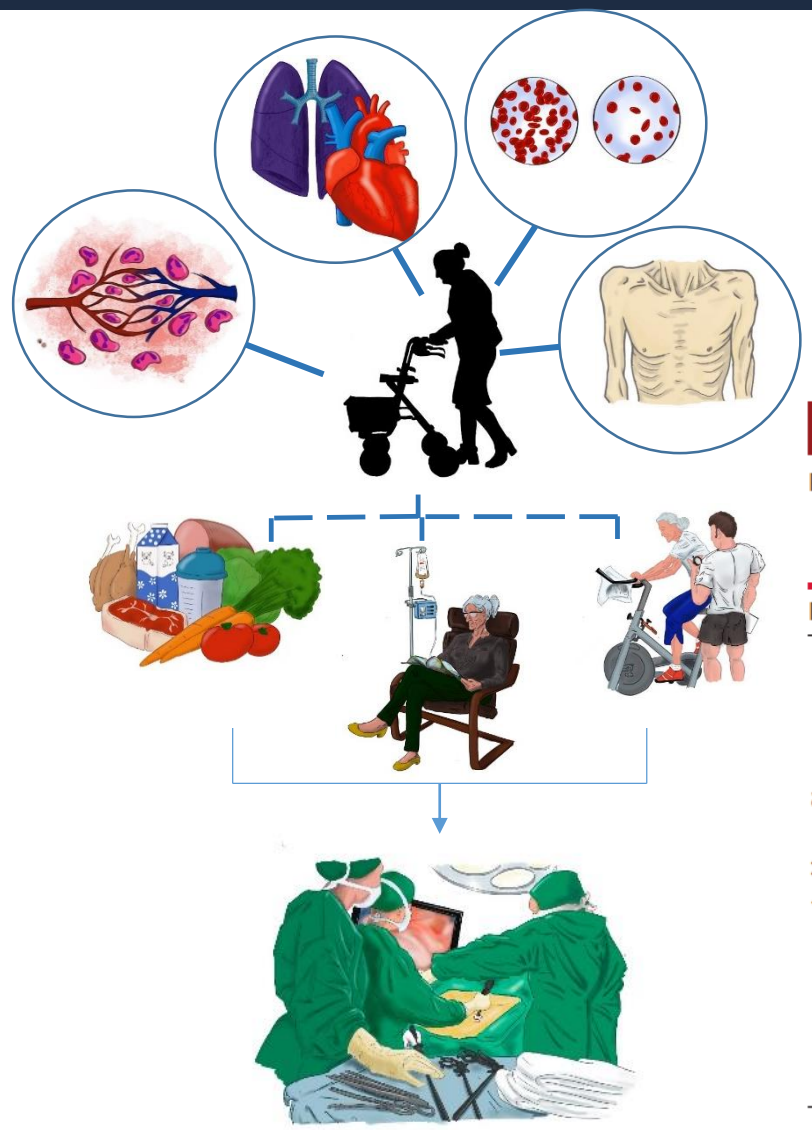


Gillis et al. Nutrition in clinical practice 2014 https://doi.org/10.1177/0884533614562840

Yeung et al. American Journal of clinical nutrition 2017 https://doi.org/10.3945/ajcn.116.148619

PRÆHABILITERING– MULTIMODAL INTERVENTION

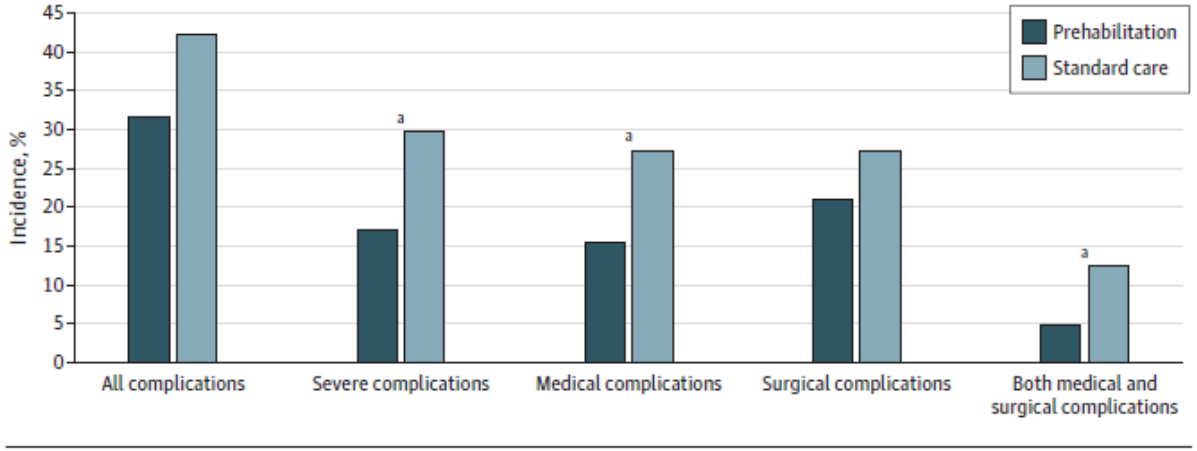
CENTER FOR SURGICAL SCIENCE



Research Original Investigation

Effect of Prehabilitation on Postoperative Complications and Functional Capacity for Colorectal Cancer Surgery

Figure 2. Complications Within 30 Days After Surgery



Complications in the intention-to-treat population (n = 251) are reported as percentage of patients having at least 1 complication, a severe complication (Comprehensive Complication Index score >20), at least 1 medical or surgical complication, and having at least 1 medical and 1 surgical complication.

[a] $P < .05$.

JAMA Surg. Published online March 29, 2023. doi:10.1001/jamasurg.2023.0198

PARENTERAL ERNÆRING?

CENTER FOR SURGICAL SCIENCE

Research

JAMA Surgery | Original Investigation

Effect of Early vs Late Supplemental Parenteral Nutrition in Patients Undergoing Abdominal Surgery
A Randomized Clinical Trial

Xuejin Gao, MD; Yuxiu Liu, MD; Li Zhang, MD; Da Zhou, MD; Feng Tian, MD; Tingting Gao, MS; Hao Tian, MS; Hao Hu, MM; Fangyou Gong, MM; Dong Guo, MD; Junde Zhou, MM; Yingchao Gu, MD; Bo Lian, MM; Zhigang Xue, MD; Zhenyi Jia, MD; Zhida Chen, MD; Yong Wang, MD; Gang Jin, MD; Kunhua Wang, MD; Yanbing Zhou, MD; Qiang Chi, MD; Hua Yang, MD; Mengbin Li, MD; Jianchun Yu, MD; Huanlong Qin, MD; Yun Tang, MD; Xiaoting Wu, MD; Guoli Li, MD; Ning Li, MD; Jieshou Li, MD; Claude Pichard, MD; Xinying Wang, MD

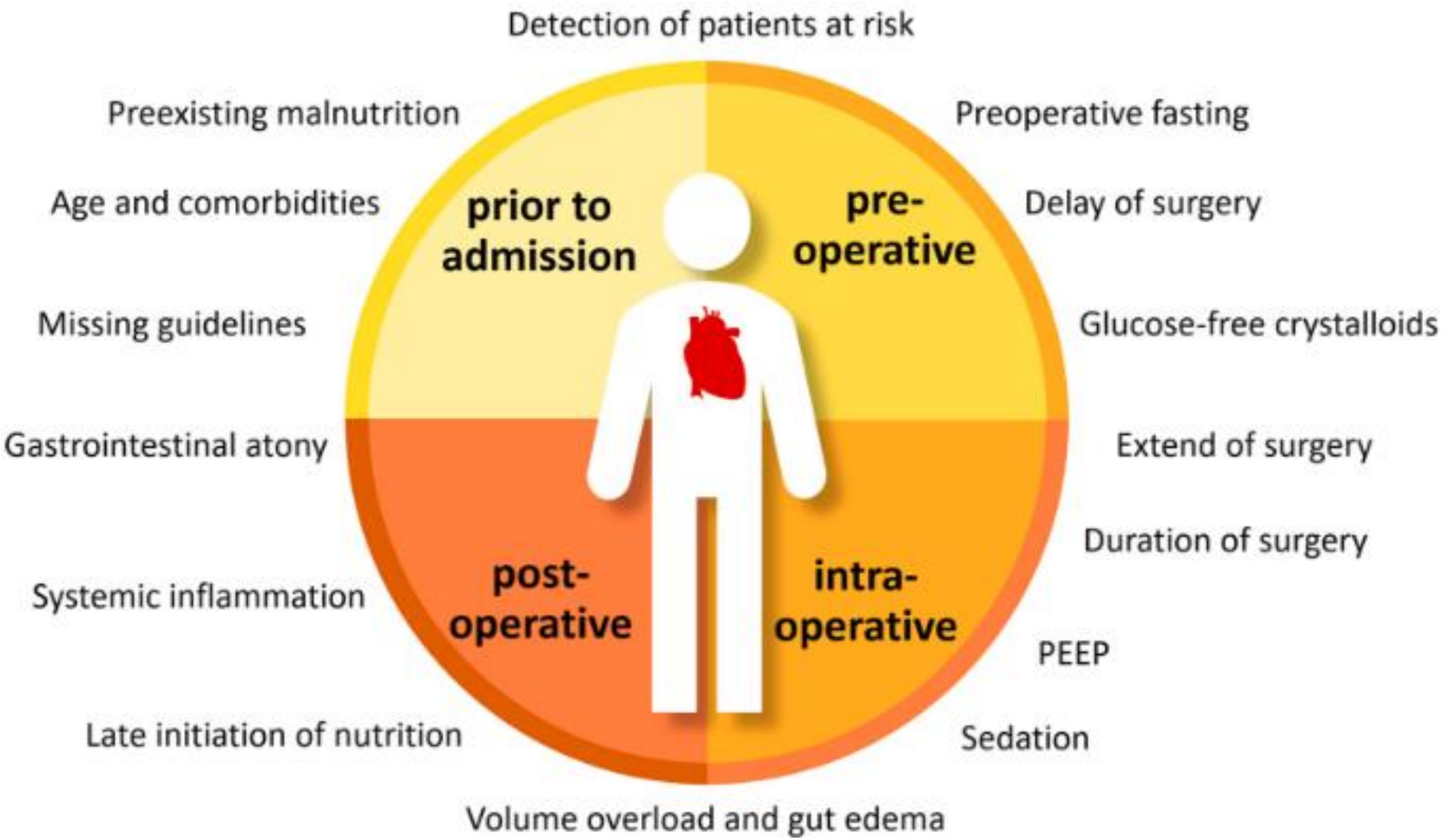
JAMA SURGERY 2022

RCT 230 Ernæringsmæssigt risiko patienter i 2 grupper
(tidlig 3 dage versus sen 8 dage)

9.7 % RR for infektiøse komplikationer

HVORFOR ER DET SÅ IKKE INDFØRT?

CENTER FOR SURGICAL SCIENCE



REGION SJÆLLAND
SJÆLLANDS UNIVERSITETSHOSPITAL
– vi er til for dig

DSKE
DANSK SELSKAB for KLINISK ERNÆRING

CENTER FOR SURGICAL SCIENCE

TAK FOR OPMÆRKSOMHEDEN

PROGRAM

17.20 Ernæring til den kirurgiske risiko patient

Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

17.40 Indsats i forhold til ernæringsrisiko og dehydrering i akutmodtagelsen (NYT-I-AMA)
Martine K. Nielsen, Klinisk Diætist, Cand.scient, Emma D.M. Pedersen, Klinisk Diætist og Anne Marie Beck, seniorforsker, klinisk diætist, Ph.D., EATEN, Herlev Gentofte Universitetshospital

18.10 Afrunding og fremtidige DSKE arrangementer

18.15 Let traktement og networking

NYT-I-AMA

Opsporing, behandling og opfølgning af ernæringsrisiko og dehydrering hos sårbare ældre patienter i akutmodtagelsen

Anne Marie Beck, Martine K. Nielsen og Emma Pedersen

Marts 2024

Enheden af Diætister og Ernæringsforskning, EATEN

Baggrund for NYT-I-AMA

Contents lists available at ScienceDirect

Clinical Nutrition ESPEN

journal homepage: http://www.clinicalnutritionespen.com

Original article

Accuracy of the calculated serum osmolarity to screen for hyperosmolar dehydration in older hospitalised medical patients

Tina Munk [a, *], Camilla Balle Bech [a], Tobias Wirenfeldt Klausen [b], Finn Rønholt [c], Charlotte Suetta [c, d, e], Anne Wilkens Knudsen [a]

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

ESPEN Guideline

ESPEN guideline on clinical nutrition and hydration in geriatrics

Dorothee Volkert [a, *], Anne Marie Beck [b], Tommy Cederholm [c], Alfonso Cruz-Jentoft [d], Sabine Goisser [e], Lee Hooper [f], Eva Kiesswetter [a], Marcello Maggio [g, h], Agathe Raynaud-Simon [i], Cornel C. Sieber [a, j], Lubos Sobotka [k], Dieneke van Asselt [l], Rainer Wirth [m], Stephan C. Bischoff [n]

UNDERNÆRING	DEHYDRERING
Øget dødelighed	Øget dødelighed
Øget sygelighed	Øget sygelighed
Øget risiko for genindlæggelser	Øget risiko for genindlæggelser
Øget risiko for tab af mental funktionsevne	Øget risiko for tab af mental funktionsevne
Øget risiko for tab af fysisk funktionsevne	Øget risiko for tab af fysisk funktionsevne
Nedsat livskvalitet	Nedsat livskvalitet

nutrients

Article

Risk of Malnutrition upon Admission and after Discharge in Acutely Admitted Older Medical Patients: A Prospective Observational Study

Aino Leegaard Andersen [1,2,*], Rikke Lundsgaard Nielsen [1,2], Morten Baltzer Houlind [1,3,4], Juliette Tavenier [1], Line J. H. Rasmussen [1,5], Lillian Mørch Jørgensen [1,6], Charlotte Treldal [1,3,4], Anne Marie Beck [7,8], Mette Merete Pedersen [1,2], Ove Andersen [1,2,6] and Janne Petersen [1,9,10]

Baggrund for NYT-I-AMA

Article

CLINICAL REHABILITATION

Does adding a dietician to the liaison team after discharge of geriatric patients improve nutritional outcome: a randomised controlled trial

Clinical Rehabilitation
2015, Vol. 29(11) 1117–1128

DOI: 10.1177/0269215514564700
cre.sagepub.com
SAGE

A Beck[1], UT Andersen[1], E Leedo[1], LL Jensen[1], K Martins[1], M Quvang[2], KØ Rask[1], A Vedelspang[1] and F Rønholt[3]

Clinical Nutrition 40 (2021) 5500–5510

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Randomized Control Trials

A multimodal nutritional intervention after discharge improves quality of life and physical function in older patients – a randomized controlled trial

Tina Munk [a, *], Jonas Anias Svendsen [a], Anne Wilkens Knudsen [a], Tanja Bak Østergaard [a], Thordis Thomsen [b], Søren Schou Olesen [c], Henrik Højgaard Rasmussen [a, d], Anne Marie Beck [a, e]

Article

CLINICAL REHABILITATION

Follow-up home visits with registered dietitians have a positive effect on the functional and nutritional status of geriatric medical patients after discharge: a randomized controlled trial

Clinical Rehabilitation
27(6) 483–493

DOI: 10.1177/0269215512469384
cre.sagepub.com
SAGE

Anne Marie Beck, Stine Kjær, Birthe Stenbæk Hansen, Rikke Lunau Storm, Kirsten Thal-Jantzen and Christian Bitz

Baggrund for NYT-I-AMA

70% vendes i døren

Baggrund for NYT-I-AMA

Evaluering af pilotprojektet

Fysioterapeuter i akutmodtagelsen

Kvalitativ erfaringsopsamling og afdækning af fysioterapeuters kompetencer i fremtidens akutmodtagelsen

Forår 2020

Ugeskr Læger 2021;183:V02210114

Håndtering af indlagte ældre patienter i akutmodtagelsen

Martin Schultz[1, 2, 3], Marie Enemark Durand[2], Søren Kabell Nissen[4], Mathias Brix Danielsen[5], Azra Osmanagic[4], Stig Andersen[5], Ulla Davidsen Lebech[3], Tina Lindenskov Carlsen[6, 7], Catherine Foss[7, 8], Jens-Ulrik Rosholm[4, 7], Hanne Elkjær Andersen[3] & Lotte Usinger[2]

TABEL 1 Faktorer, der skal vurderes/håndteres ved modtagelse af den akut indlagte ældre patient, og som skal berøres ved den første vurdering og indgå i den helhedsorienterede geriatriske vurdering.

Den akutte tilstand skal stabiliseres, udredes og behandles
Indhentning af supplerende anamnese fra pårørende/plejepersonale
Vurdering af hydrering, herunder væskeplan for de første 24 t.
Status på kroniske sygdomme, herunder præcisering af grad: eGFR/FEV1/LVEF
Funktionsniveau nu og tidligere skal afdækkes: kan patienten gå og stå?
Er der sket akutte ændringer i forbindelse med denne indlæggelse?
Vurdering af den kognitive status: hvorvidt der er ny forværring eller mistanke om delirium
Medicingennemgang: tænk mulige bivirkninger, nyrefunktion, blodtryk, diabetes, bevidsthedsniveau, interaktion eller bivirkninger af ny medicin
Kan patienten spise og drikke selvstændigt?
Nyopstået dysfagi skal opdages
Der skal ordineres ernæringsscreening og der skal overvejes plan for suppl. mad, evt. sonde
Afdækning af den sociale status: hjælpemidler, hjemmehjælp, herunder om der skal iværksættes yderligere tiltag
Vurdering af svimmelhed og faldtendens
Henvisning til relevant udredning enten ambulant eller under indlæggelse, herunder evt. stillingtagen til osteoporoseudredning
Behandlingsniveau med udgangspunkt i patientens ønsker
Planlægning af et forløb der inkluderer så få skift som muligt
Ved udskrivelse laves plan for opfølgning og overdragelse af vigtige informationer til pårørende, pleje eller egen læge
Stillingtagen til opfølgning i hospitalsregi, kommunalt eller praktiserende læger

eGFR = estimeret glomerulær filtrationshastighed; FEV1 = volumen af en forceret udånding i det 1. sek.; LVEF = venstre ventrikels uddrivningsfraktion.

Formål

Det primære formål med projektet er at udvikle og afprøve et nyt forløb for opsporing, behandling og opfølgning af ernæringsrisiko og dehydrering hos sårbare ældre patienter i AMA.

Det sekundære formål er at få en indikation for, om behandlingen er effektiv.

Metode

Indsats og inspirationskatalog

– udkast til afprøvning

DRIEstudy
Dehydration Recognition in our Elders

NHS National Institute for Health Research

UEA University of East Anglia

DRIE - Dehydration Recognition in our Elders

DRIE - Dehydration Recognition In our Elders

This website provides information about the DRIE Dehydration Recognition In our Elders studies, what they are about, how they are set up and run and who to contact if you want to find out more.

Dehydration – what is the problem?

Dehydration, when we don't drink enough for our needs, is bad for all of us. In older people severe dehydration increases confusion and falls, and makes sudden hospital admission more likely. We don't have a good method of recognising dehydration early, before it becomes severe. Being able to identify dehydration early would allow us to take action to prevent severe dehydration, such as extra encouragement with drinking.

What will the research do?

This research aims to improve the health and wellbeing of older people by finding out how we can tell when they are drinking enough fluid, and understanding how to help them to drink more when they are not drinking enough.

The specific objectives are to:

Identify an easy method that can signal when someone needs to drink more. We are doing this by interviewing people living in care homes who are interested in taking part in this study. During the interview we assessed whether the care home resident was drinking enough by assessing their hydration status (measuring serum osmolality). We also carried out a set of tests commonly used by health care staff to assess for hydration status in older people, including squeezing the skin on the back of the hand (skin turgor), looking for tongue furrows, and checking urine colour. Using this information from 200 older people we identified a 3-stage method for identifying when older people are not drinking enough. This is the DRIE study.

Check this new 3-stage method. In the DRIE study we identified a 3-stage method for identifying when older people are not drinking quite enough. We have talked to our advisors living

. : Contact us

If you have any questions or would like to participate please contact the lead researcher:

Dr. Lee Hooper,
Norwich Medical School, University of East Anglia,
Norwich NR4 7TJ, Norfolk, UK
Phone (mobile): 0781 391 7444
Email: l.hooper@uea.ac.uk

If anything goes wrong, or you have any worries or complaints about the conduct of the research please contact Lee or Sue Steel, the study sponsor, on 01603 591486 or email sue.steel@uea.ac.uk

. : Study Newsletters

- Newsletter 1, January 2012
- Newsletter 2, April 2012
- Newsletter 3, July 2012
- Newsletter 4, October 2012
- Newsletter 6, February 2013

Metoder

Indsats og inspirationskatalog

– udkast til afprøvning

Dette Indsats- og inspirationskatalog er udarbejdet i forbindelse med projektet NYT-I-AMA, som har til formål at udvikle og afprøve et nyt forløb for opsporing, behandling og opfølgning af ernæringsrisiko og dehydrering hos sårbare ældre patienter i akutmodtagelsen på Herlev Hospital. Projektet gennemføres i et samarbejde med fire involverede kommuner; Gladsaxe, Rudersdal, Lyngby-Tårbæk og Ballerup. Ernæringsprofessionelle fra de fire kommuner har bidraget til dette indsats- og inspirationskatalog ved to workshops.

Målgruppen er alle de personalegrupper, der kommer i berøring med ældre i primærsektoren.

For bedst muligt at kunne opspore og behandle de ældre, der er i risiko for dehydrering, er det vigtigt også at have fokus på, hvor meget man selv får husket at drikke i løbet af dagen – og ikke mindst de tiltag man gør for at huske at få drukket – de ideer kan jo også komme de ældre til gode.

NYT I AMA

Herlev og Gentofte Hospital

Op i væske

Tips og ideer til hvordan du kan få drukket nok, når du bliver ældre

NYT I AMA

Pjecen er udarbejdet som en del af projektet NYT-I-AMA på Herlev-Gentofte Hospital i samarbejde med Rudersdal, Lyngby-Tårbæk, Gladsaxe og Ballerup Kommune.

Metode

Øget fokus i diætbehandlingen

- Spørge mere ind til væske generelt
- Informere om væskebehov
- Informere om hvorfor subjektive parametre ikke kan bruges
- Informere om hvad der tæller med

Indsats og inspirationskatalog

– udkast til afprøvning

Dette Indsats- og inspirationskatalog er udarbejdet i forbindelse med projektet NYT-I-AMA, som har til formål at udvikle og afprøve et nyt forløb for opsporing, behandling og opfølgning af ernæringsrisiko og dehydrering hos sårbare ældre patienter i akutmodtagelsen på Herlev Hospital. Projektet gennemføres i et samarbejde med fire involverede kommuner; Gladsaxe, Rudersdal, Lyngby-Tårbæk og Ballerup. Ernæringsprofessionelle fra de fire kommuner har bidraget til dette indsats- og inspirationskatalog ved to workshops.

Målgruppen er alle de personalegrupper, der kommer i berøring med ældre i primærsektoren.

For bedst muligt at kunne opspore og behandle de ældre, der er i risiko for dehydrering, er det vigtigt også at have fokus på, hvor meget man selv får husket at drikke i løbet af dagen – og ikke mindst de tiltag man gør for at huske at få drukket – de ideer kan jo også komme de ældre til gode.

Metode

Pt. er henvist mhp. ernæringsterapi / Afsluttende notat ifm. udskrivelsen

Status
Dato ***
@VURSKEMAER(300220)@

Habituel vægt:
***

Udredning
Ernæringsbegrænsende faktorer (NIS):
***

Energi- og proteinbehov:
@VURSKEMAER(3040072323)@

Væskebehov:
***

Dækningsgrad:
***

Ernæringsscreening:
@VURSKEMAER(3040072317,3040072322)@

pt. er screenet til at være i ernæringsrisiko.

Screening for dehydrering: pt. er screenet til at være dehydreret ved indlæggelsen (beregnet osmolaritet > 295)

Vurdering:
***

Ad blodprøver:
@RESUSIDST(KALIUMP,VITAMIN DP,ZINKP,,FOSFATP,MAGNESIUMP,DVITAMINP)@

Øvrigt relevant, fx funktionsniveau, indlæggelseshyppighed, hjemmehjælp, kontaktpersoner mm.

Ernæringsplan - i samråd med pt.
Kostform: *(evt. blød kost eller konsistens af mad og drikke jf. vurdering fra ergoterapeut)*

Pt. er vejledt i en energi- og proteinrig kost med fokus på proteinrige drikkevarer og mellemmåltider løbende over dagen.

Tilskud:

Udleveret: grøn recept samt individuelt dagskostforslag

*Grøn recept er sendt via sikker mail til *** efter aftale med pt. (bestilling er ikke foretaget).*

Pt. giver samtykke til, at UT. sender klinisk korrespondancemeddelelse mhp. ernæringsmæssig opfølgning kommunalt efter udskrivelsen.

Pt. afsluttes ifm. udskrivelsen.

Metode

JCN Journal of Clinical Nursing

Journal of Clinical Nursing

ORIGINAL ARTICLE

Implementing evidence-based practices in an emergency department: contradictions exposed when prioritising a flow culture

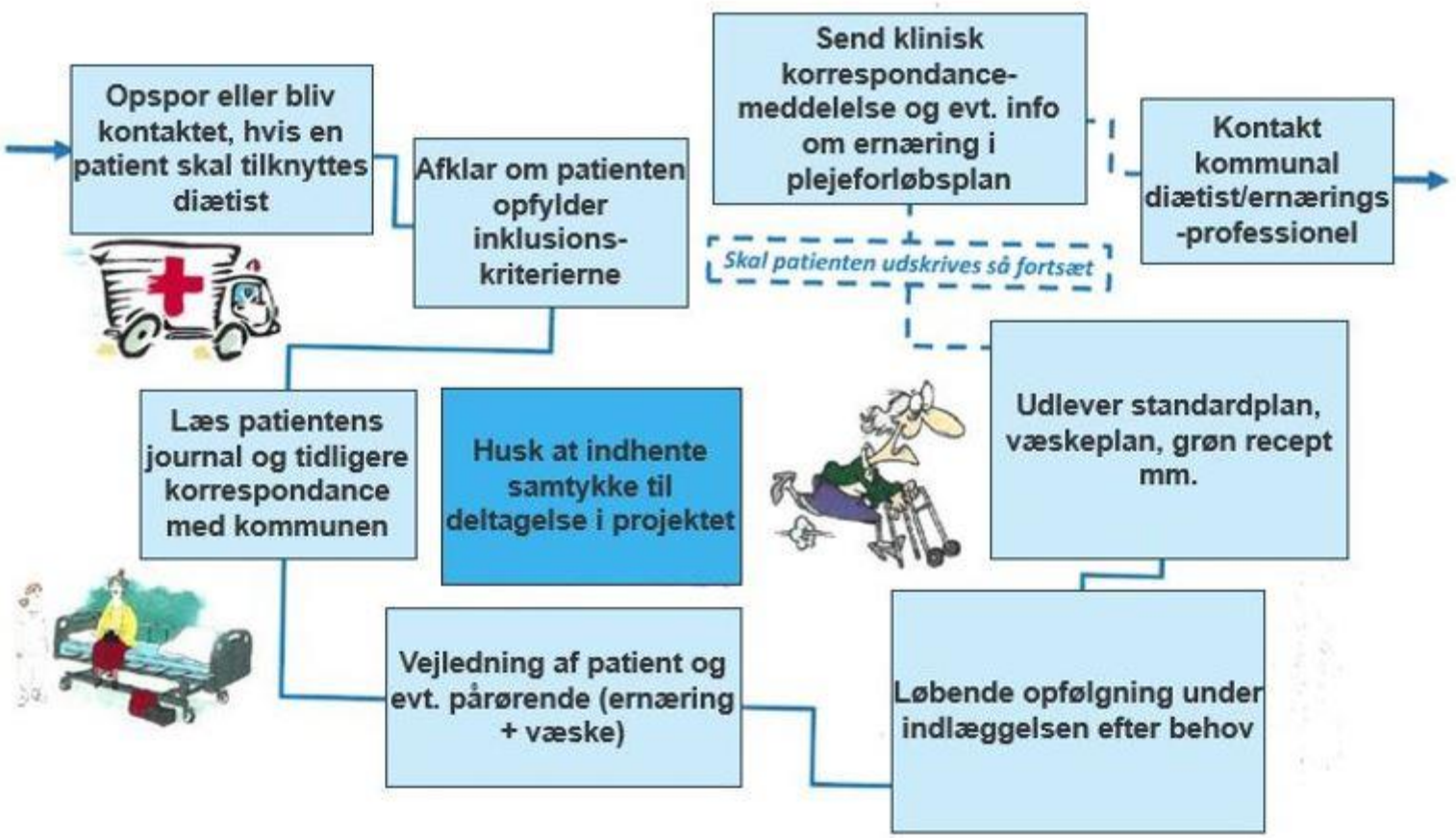
Jeanette W Kirk and Per Nilsen

Metode

Inklusionskriterier:

- Patienter > 65 år indlagt i AMA på Herlev Hospital (AKA, D404 og O404M)
- I ernæringsrisiko (samlet score ≥ 3) og/eller
- Dehydreret (beregnet osmolaritet > 295)
- Bopæl i Rudersdal, Ballerup, Lyngby-Taarbæk eller Gladsaxe kommune

Plan for NYT-I-AMA



Plan for NYT-I-AMA

30 dage efter udskrivelsesdato
Genindlæggelser (antal):
Genindlæggelsesårsag(er):
Genindlæggelsesdiagnose(r):
Indlæggelsesdage (antal under primær indlæggelse):
Død: Ja ☐ Nej ☐
Evt. dødsårsag:

Livskvalitet (Quality of Life – Euroqol-5D-5L)		
Hvis skemaet ikke kan besvares, angiv årsag:		
Kan ikke medvirke til at svare (sæt kryds): _____		*ved ikke: (sæt kryds):* _____
Talrække:_____	Værdi:_____	VAS:_____

Self-efficacy (GSES)	
Hvis skemaet ikke kan besvares, angiv årsag:	
Kan ikke medvirke til at svare (sæt kryds): _____	*ved ikke: (sæt kryds):* _____
Samlet score:_____	

Spørgeskema om tilfredshed med indsatsen	
Hvis skemaet ikke kan besvares, angiv årsag:	
Kan ikke medvirke til at svare (sæt kryds): _____	ved ikke: (sæt kryds): _____
Svar noteres på separat ark	

Fokus på væskeindtag i praksis

Hos indlagt patient (fokus væske derhjemme)

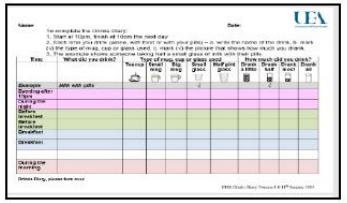
- Glas rundt i huset
- Sedler på glas
- Drikkelse som gave
- Skål med patienten

Fokus på væskeindtag i praksis

Activities Included in this Section…

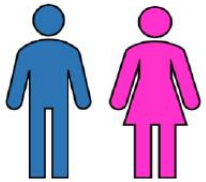
Ten Minutes for a Drink and Chat

Choosing the Right Cup, Mug or Glass



Supporting Residents to Record and Reflect on How Much They Are Drinking

Discussion with Residents about Drinking



Discussion with Residents about Incontinence

Hydration Poster Activity

Fokus på væskeindtag i praksis

So if that is the amount in a cup, how many cups do your residents need each day?

	Fluid volume of this vessel:	**Women need 1.6L or 1600ml or almost 3 pints or:**	**Men need 2L or 2000ml or 3 ½ pints or:**
	100 ml	16 drinks of this size every day	20 drinks of this size every day
	150ml	11 drinks of this size every day	14 drinks of this size every day

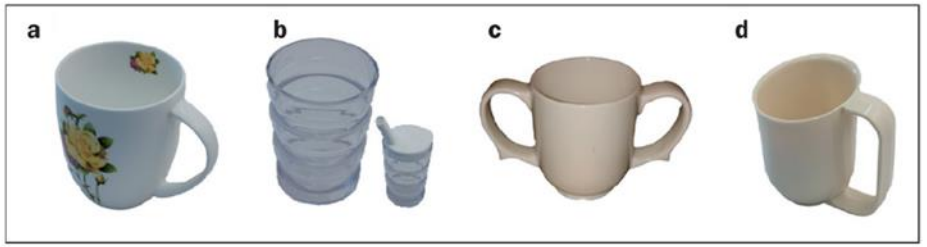
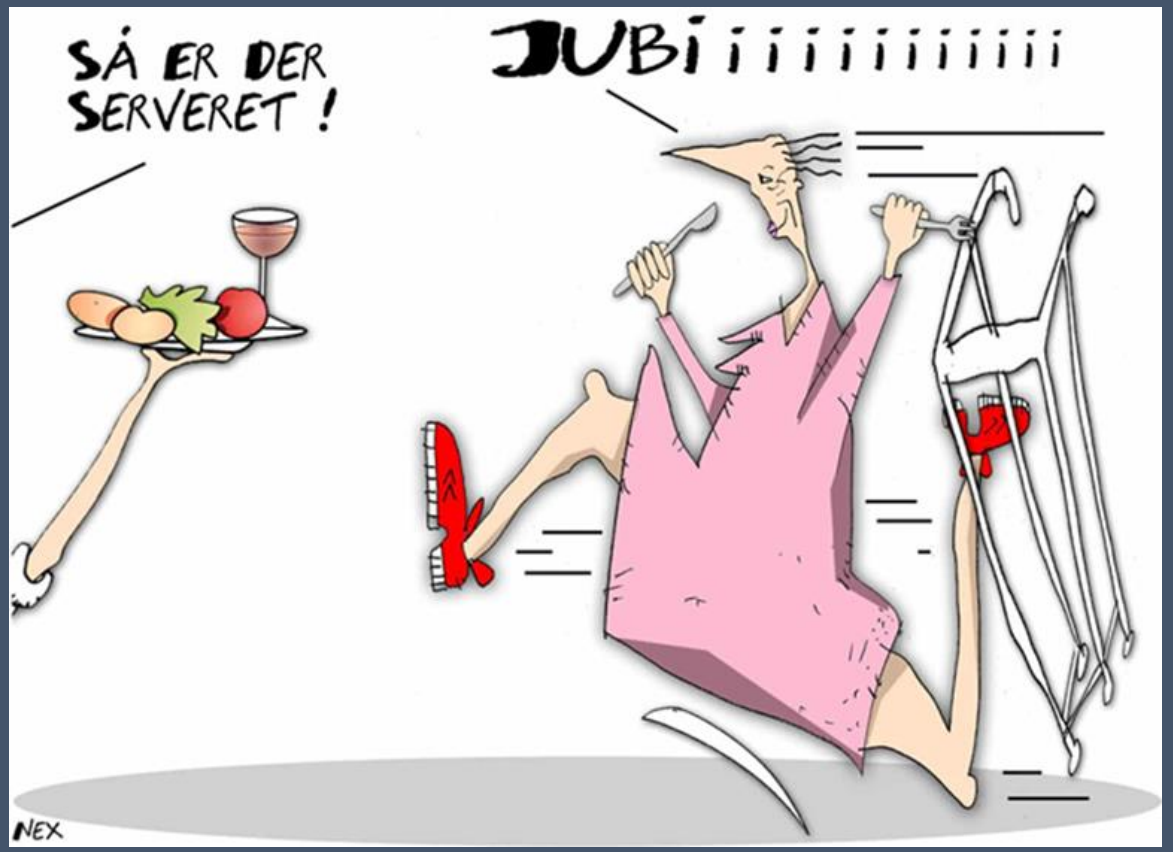


Figure 2. The vessels introduced on the unit following the testing: a new mug (a), a plastic tumbler with horizontal ridges (smaller vessel shows the same tumbler converted to a beaker) (b), a double-handled mug (c), dysphagia cup (not previously tested but highly recommended by speech and language therapist) (d)

Status uge 12

- 174 screenet
- 72 (46%) dehydrerede (20 (11%) ikke muligt at beregne)
- 4 (2%) med diagnosen dehydrering
- 58 (94%) ernæringsrisiko, 112 (64%) muligvis (ingen vejning eller ikke fulgt op)
- 1 (1%) med ernæringsdiagnose
- 49 er tilbudt deltagelse, 29 (59%) sagt ja (mål er 40 patienter)
- 1 (3%) er faldet fra
- 10 fulgt op efter 30 dage

Spørgsmål?
Gode ideer til implementering?



PROGRAM

17.20 Ernæring til den kirurgiske risiko patient
Rasmus Dahlin Bojesen, Læge, Ph.d., Kirurgisk afdeling, Sjællands Universitets Hospital, Køge og Center for Surgical Science

17.40 Indsats i forhold til ernæringsrisiko og dehydrering i akutmodtagelsen (NYT-I-AMA)
Martine K. Nielsen, Klinisk Diætist, Cand.scient, Emma D.M. Pedersen, Klinisk Diætist og Anne Marie Beck, seniorforsker, klinisk diætist, Ph.D., EATEN, Herlev Gentofte Universitetshospital

18.10 Afrunding og fremtidige DSKE arrangementer

18.15 Let traktement og networking

Fremtidige arrangementer

3. April	Initiativmøde om dehydrering hos ældre - Rigshospitalet
3. Maj	DSKE – Årsmøde – Hotel Marselis, Aarhus
27. Maj	Initiativmøde om Tarmsvigt – Rigshospitalet

..... Og mange flere i efteråret!

MEDLEMSKAB – DSKE.DK

DSKE
DANSK SELSKAB for KLINISK ERNÆRING

ERNÆRING ER EN MENNESKERET

Facebook: DSKE

LinkedIn: Dansk Selskab for Klinisk Ernæring

Kontakt DSKE

Læs DSKEs persondatapolitik HER

Målsætning

FORSIDE | MEDLEMSSKAB | VEDTÆGTER | BESTYRELSE | GENERALFORSAMLING | NYHEDSBREV | LEGATER
SAMARBEJDE | ESPEN | ONCA | ALMU | RESSOURCER | KLINISKE RETNINGSLINJER | ARRANGEMENTER | ERNÆRINGSUGEN

ÅRLIG KONTINGENT: 325 DKK

REGION SJÆLLAND
SJÆLLANDS UNIVERSITETSHOSPITAL
– vi er til for dig

DSKE
DANSK SELSKAB for KLINISK ERNÆRING

TAK FOR I AFTEN

● Ines Raben ir@regionsjaelland.dk ● Camilla Balle Bech camilla.balle.bech@regionh.dk
● Helena Dominiak helenadominiak@gmail.com ● Rasmus Dahlin Bojesen radb@regionsjaelland.dk