2016 ESPEN Congress (Copenhagen, 17-20 September 2016)
ESPEN-ENHA-MNI Joint Session

Medical Nutrition supports cost-effective care

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DI MEDICINA CLINICA

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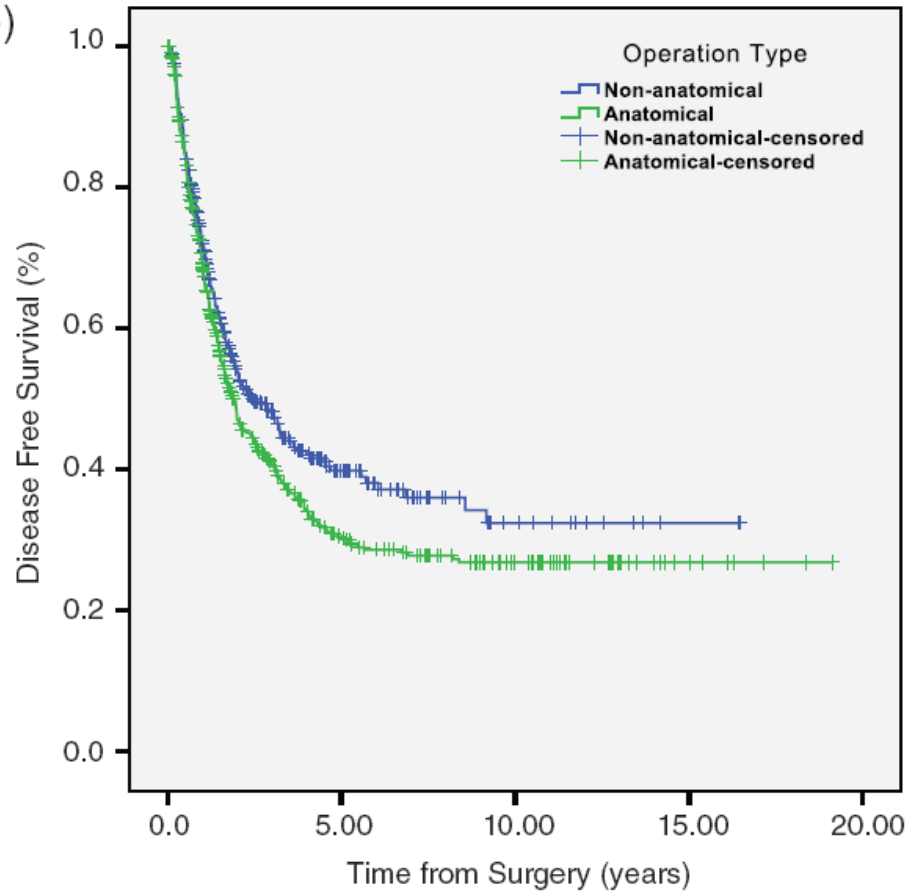
Impact of parenchymal preserving surgery on survival and recurrence after liver resection for colorectal liver metastasis

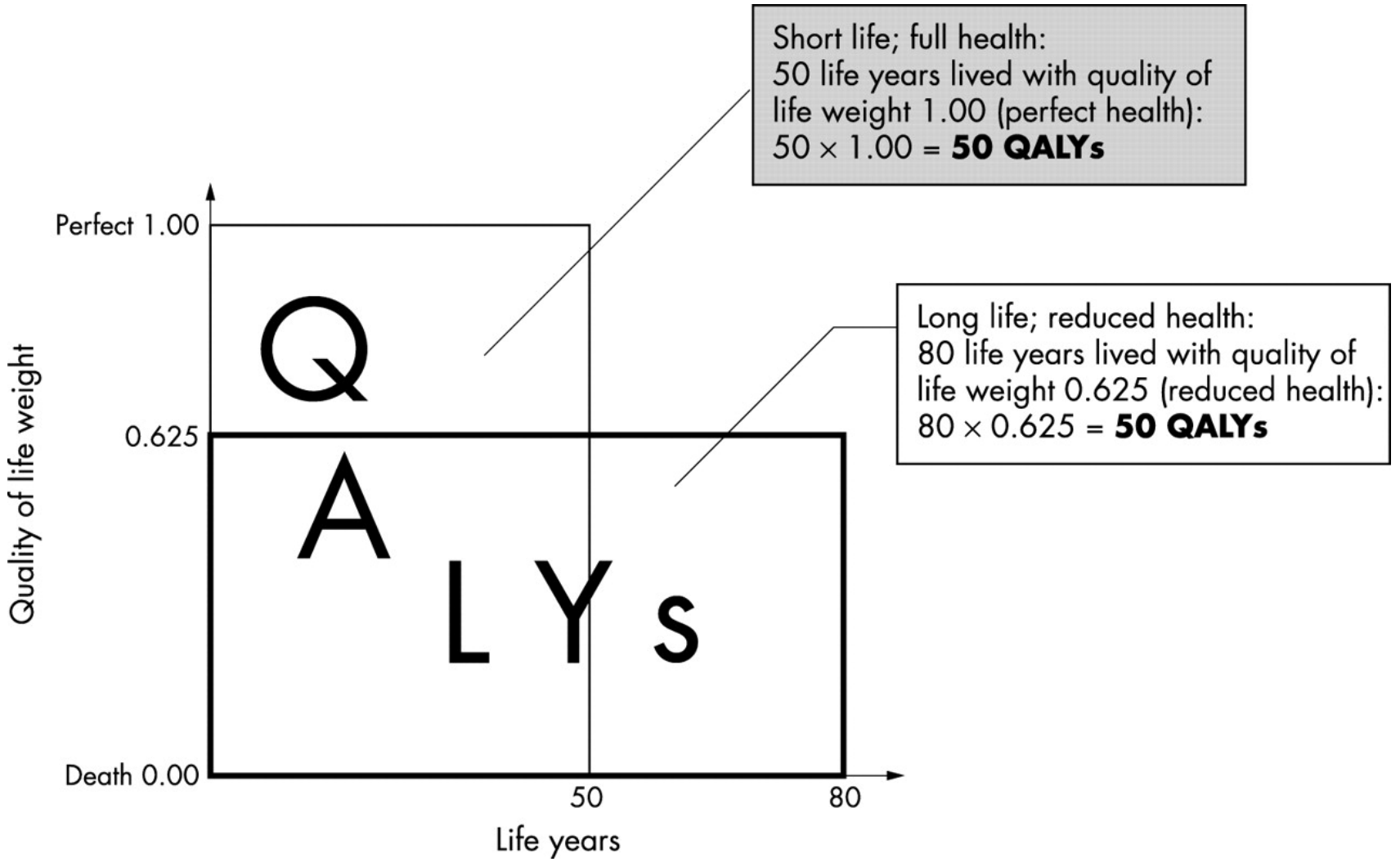
Sanjay Pandanaboyana,* Richard Bell,† Alan White,† Samir Pathak,† Ernest Hidalgo,† Peter Lodge,† Raj Prasad† and Giles Toogood†

(b)



	0	5	10	15
Non-anatomical	409	58	14	2
Anatomical	582	98	39	9

ANZ J Surg 2016 (epub anead of print)


Short life; full health:
50 life years lived with quality of life weight 1.00 (perfect health):
50 × 1.00 = **50 QALYs**
Long life; reduced health:
80 life years lived with quality of life weight 0.625 (reduced health):
80 × 0.625 = **50 QALYs**
Perfect 1.00
0.625
Death 0.00
Quality of life weight
Q
A
L Y s
50
80
Life years


G16
G16
G16
G16
G16

"The costs of some of the newest targeted therapies and immunotherapies being 4,000 the price of gold …."

L. Hutchinson, Nat Rev Clin Oncol 2015

"… the biggest toxicity to cancer patients is the cost of cancer treatment - namely, dugs."

L. Hutchinson, Nat Rev Clin Oncol 2015

"When the value of a year of life is set at US$120,000 and the toxicity discount is set at 15%, only 9 out of 54 anti-cancer drugs (16%) are currently priced lower than their 'value-based price'."

A. Mullard, Nat Rev Drug Discov 2015

(calculations made by using DrugAbacus, www.drugabacus.com, developed by Peter Bach, Memorial Sloan Kettering Cancer Center, New York, NY, USA)

PERSPECTIVE

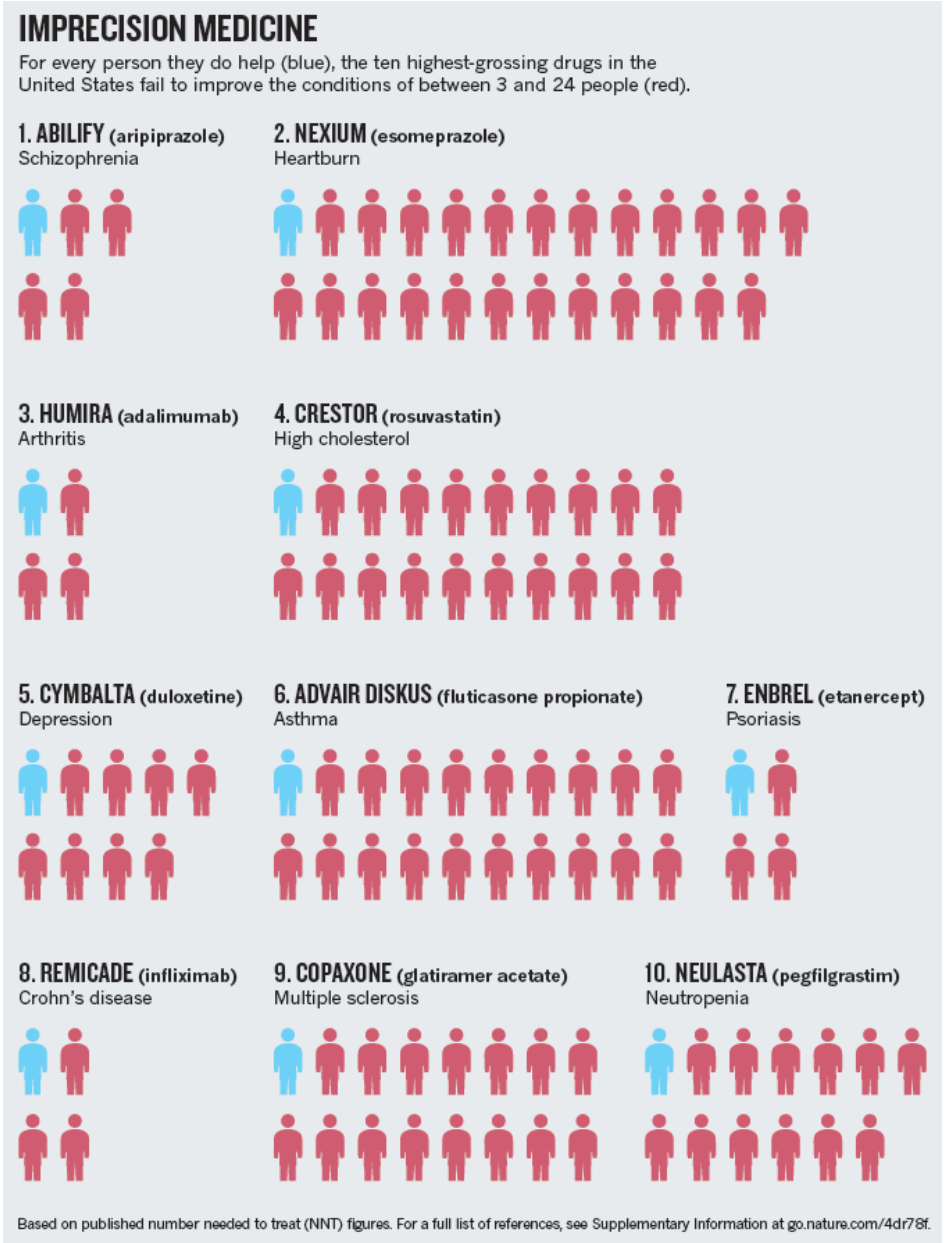
The precision–oncology illusion

Precision oncology has not been shown to work, and perhaps it never will, says **Vinay Prasad**.

WHEN CONSIDERED **OBJECTIVELY,** THE PROSPECTS AND POTENTIAL OF PRECISION ONCOLOGY ARE **SOBERING.**

Prasad V. Nature 2016; 537:S63

Time for one-person trials



Schork NJ. Nature 2015; 520:609-611

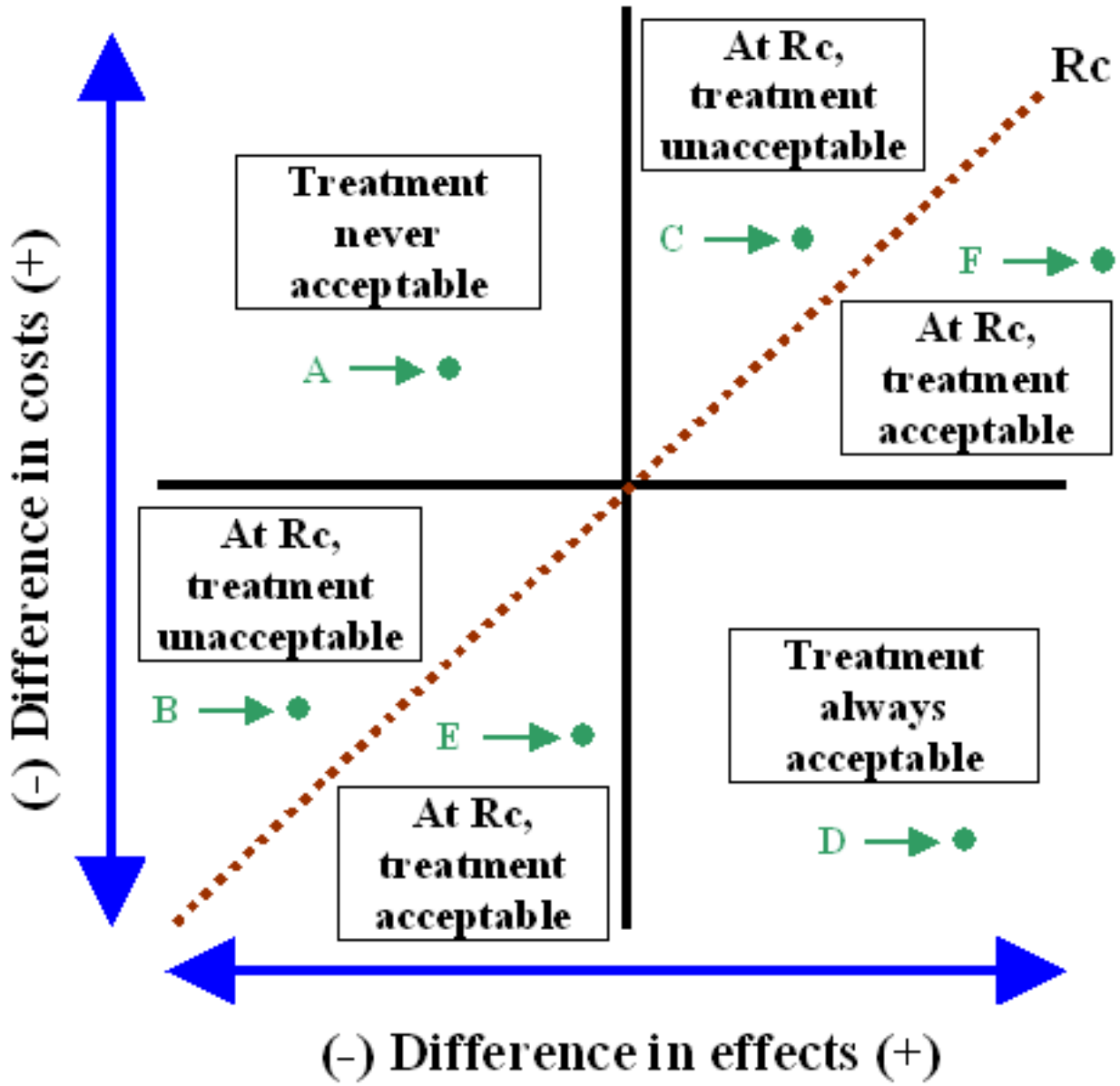
Original article

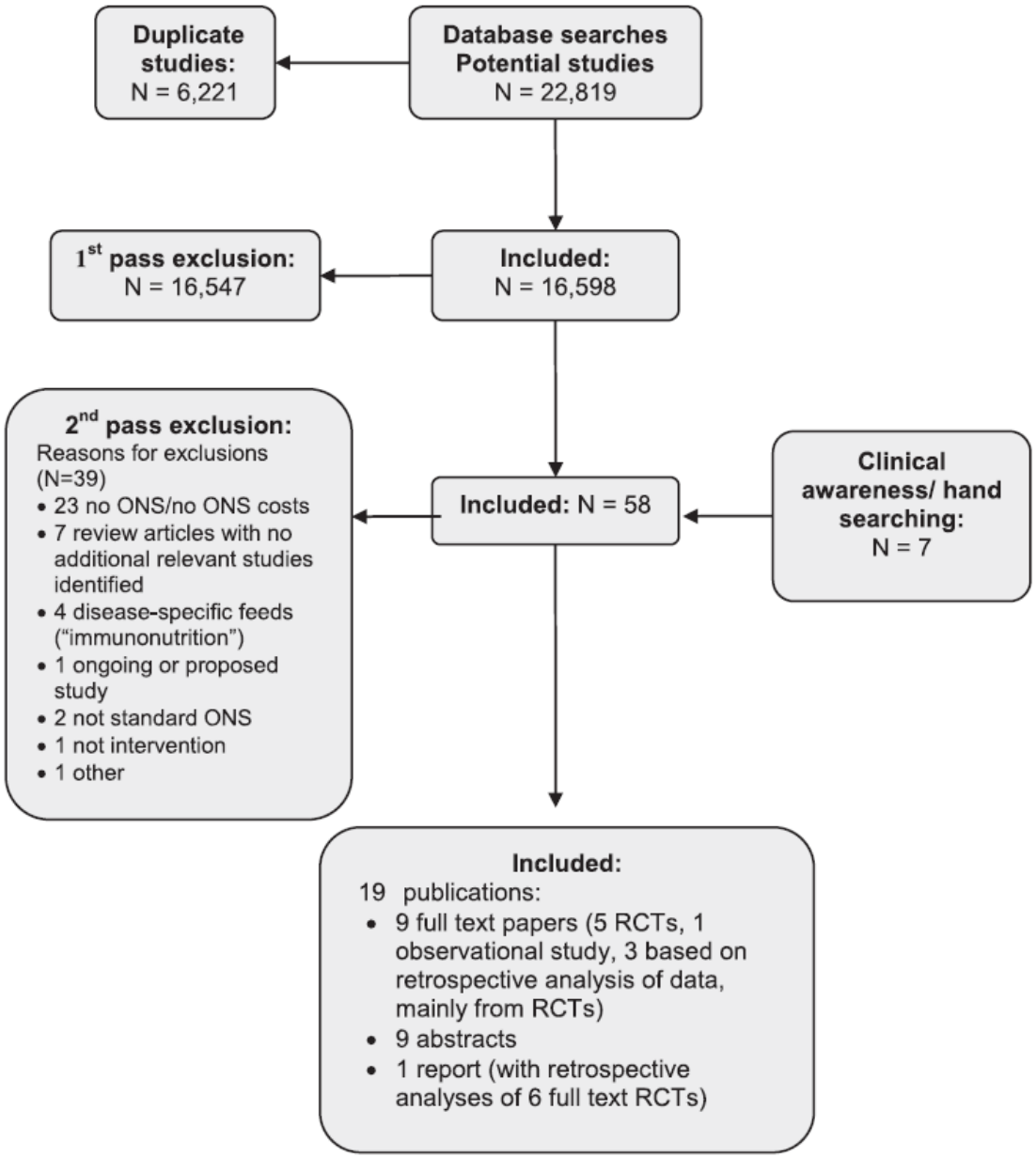
The economic costs of disease related malnutrition☆

Table 3
Total additional costs of disease related malnutrition according to gender, age and healthcare sector * 1.000.000 (Euro 2011).

Age	Men		Women		Total
	>18 and <60	>60	>18 and <60	>60	All ages
Hospital setting	188	424	184	437	1233
Nursing- and residential home setting	9	107	6	331	453
Home care setting	6	43	9	126	185
Total	203	574	200	894	1871

Freijer K et al. Clin Nutr 32:136-141, 2013

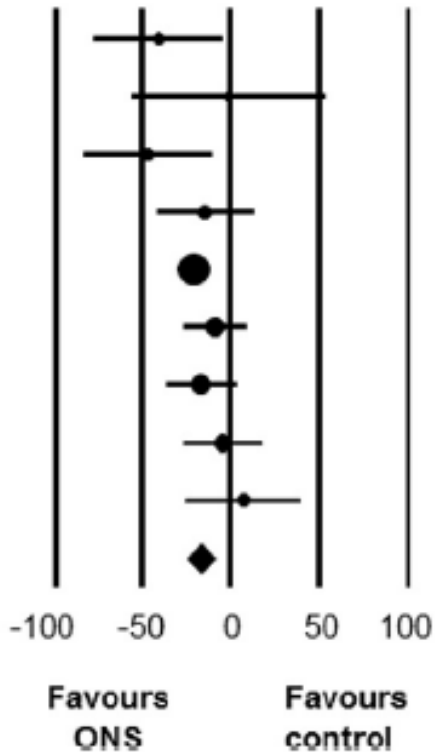

Rc
At Rc, treatment unacceptable
Treatment never acceptable
C
F
A
At Rc, treatment acceptable
At Rc, treatment unacceptable
B
E
Treatment always acceptable
D
At Rc, treatment acceptable
(-) Difference in costs (+)
(-) Difference in effects (+)



Elia M et al. Clin Nutr 2016; 35:125-137

A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in community and care home settings

	Setting	Measure	Difference in means	Standard error	p-Value
Norman et al 2012[13]	C	a	-41.163	18.649	0.027
Edington et al 2004[26]	C	b	-1.923	27.545	0.944
Hirsch et al 1993[39*]	C	b	-46.875	18.169	0.010
Wilson et al 2001[40*]	C	c	-14.631	14.000	0.296
Arnaud-Battandier et al 2004[19]	C	e	-21.041	4.606	0.000
Smedley et al 2004 (SC)[18*]	C (preop)	d	-9.220	8.753	0.292
Smedley et al 2004 (SS)[18*]	CHC	d	-17.021	9.915	0.086
Smedley et al 2004 (CS)[18*]	HC	d	-4.965	11.263	0.659
Neelemaat et al 2012[14]	HC	d	6.667	16.280	0.682
			-16.535	3.996	0.000

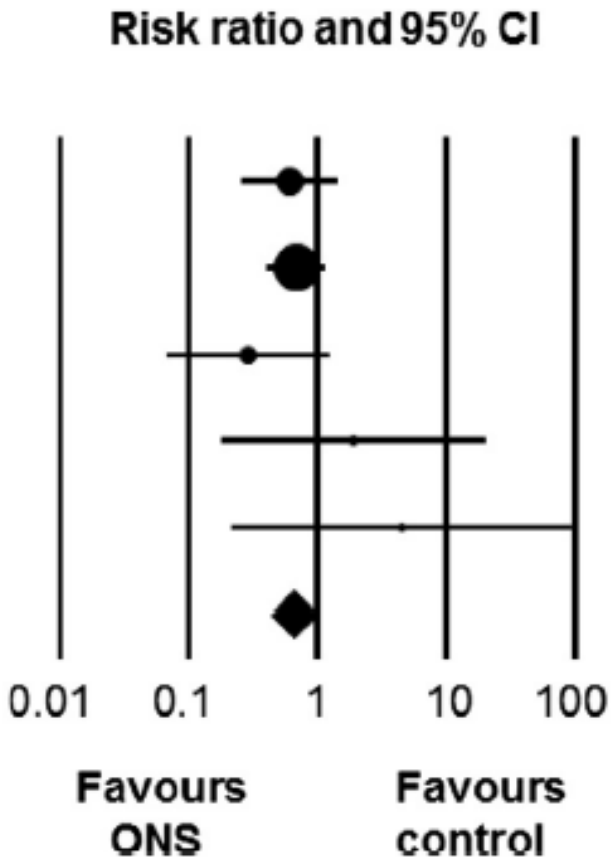


hospitalization

Elia M et al. Clin Nutr 2016; 35:125-137

A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in the hospital setting

	Risk ratio	p-Value
Delmi et al 1990 (6 months)[35]	0.600	0.237
Potter et al 2001[36]	0.667	0.119
Gariballa et al 1998 (3 months)[38]	0.286	0.089
MacFie et al (2000)[33]	1.852	0.605
Keele et al 1997 (before day 1)[32]	4.444	0.332
	0.650	0.038

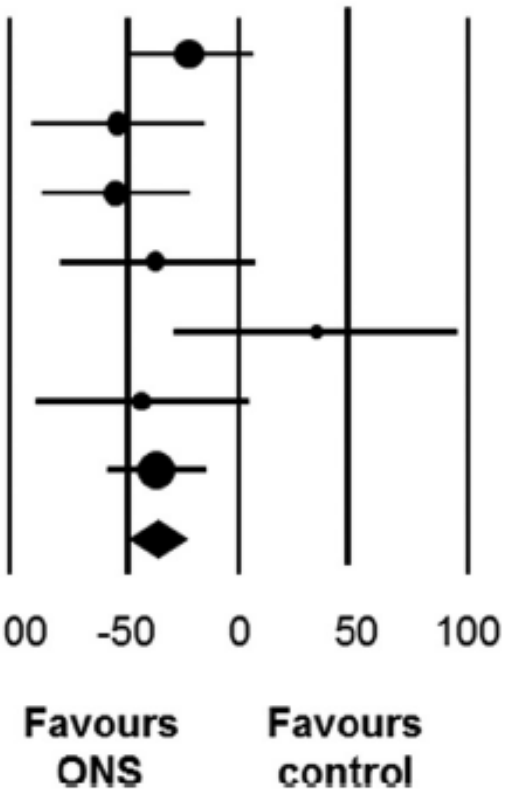


Mortality

Elia M et al. Clin Nutr 2016; 35:370-380

A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in the hospital setting

	Difference in means	Standard error	p-Value
Smedley et al 2004[26]	-22.4	13.9	0.107
Keele et al 1997[25]	-53.0	19.1	0.006
Rana et al 1992[24]	-53.8	16.4	0.001
Beattie et al 2000[28]	-36.8	21.4	0.086
MacFie et al 2000[27]	33.4	31.4	0.288
Delmi et al 1990[29]	-42.8	23.4	0.068
Lawson et al 2003[40]	-36.0	10.8	0.001
	-35.3	7.6	0.000

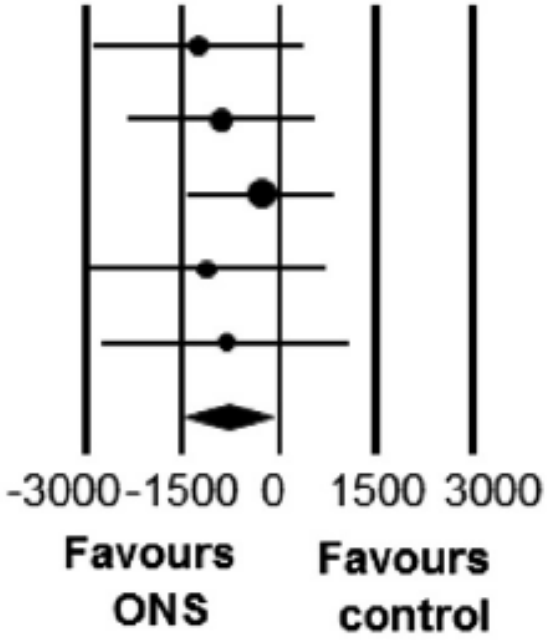


Surgical complications

Elia M et al. Clin Nutr 2016; 35:370-380

A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in the hospital setting

	Difference in means	Standard error	p-Value
Rana et al 1992[31]	-1249	832	0.133
Keele et al 1997[32]	-897	718	0.212
Smedley et al 2004[26]	-261	561	0.666
MacFie et al 2000[33]	-1126	933	0.228
Beattie et al 2000[34]	-830	969	0.392
	-746	338	0.027

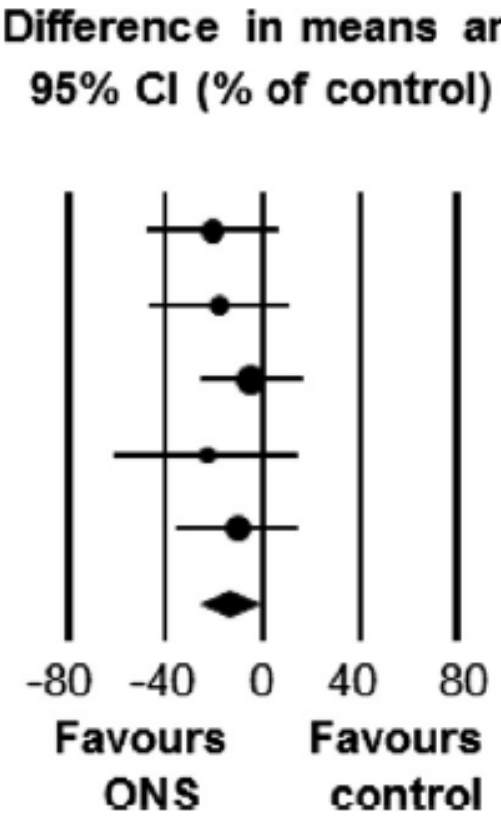


Cost savings (GBP)

Elia M et al. Clin Nutr 2016; 35:370-380

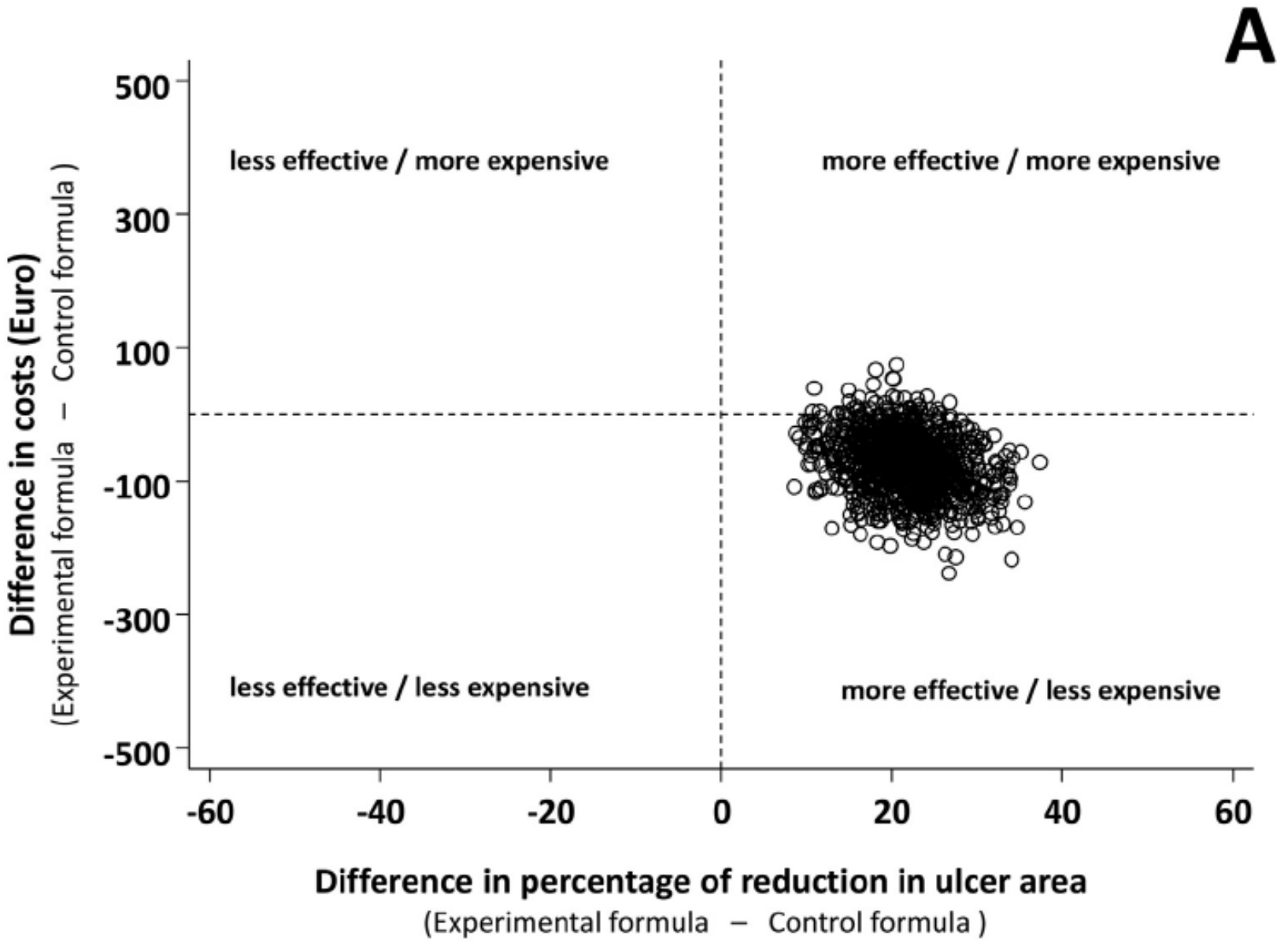
A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in the hospital setting

	Difference in means	Standard error	p-Value
Rana et al 1992[31]	-20.7	13.8	0.133
Keele et al 1997[32]	-18.2	14.5	0.212
Smedley et al 2004[26]	-4.9	10.6	0.642
MacFie et al 2000[33]	-23.0	19.1	0.228
Beattie et al 2000[34]	-10.6	12.4	0.392
	-13.2	6.0	0.027



Cost savings (%)

Elia M et al. Clin Nutr 2016; 35:370-380



Cereda E et al. 2015

Impact of Oral Nutritional Supplementation on Hospital Outcomes

Table 5. Effect of ONS Use on 30-Day Readmission[a]

	Regression Specification				
	(1)	(2)	(3)	(4)	(5)
Subset of Matched Sample Analyzed	**Follow-up at least 1 d**	**Follow-up at least 1 d**	**Follow-up 1 d to 3 y**	**Follow-up 1 d to 2 y**	**Follow-up 1 d to 1 y**
Model	OLS	IV	IV	IV	IV
Effect of any ONS use on probability of readmission (SE)	−0.00310[b] (0.00103)	−0.0231[b] (0.00204)	−0.0475[b] (0.00225)	−0.0504[b] (0.00235)	−0.0550[b] (0.00254)
Predicted probability of readmission without ONS	0.334	0.343	0.369	0.377	0.391
Predicted probability of readmission with ONS	0.331	0.320	0.322	0.327	0.336
Change due to ONS use	−0.9%	−6.7%	−12.7%	−13.3%	−14.1%
Observations, n	862,960	862,960	735,636	670,823	566,682

IV indicates instrumental variables; OLS, ordinary least squares; ONS, oral nutritional supplements; SE, standard error.
[a]The 30-day readmission window was approximate as only the month and year were observed in the data. Regression results were from a sample of ONS episodes matched 1:1 to non-ONS episodes on propensity to receive ONS. Terminal episodes and tube-fed episodes were excluded. The instrument was the fraction of episodes in a given hospital in a given quarter involving ONS use. Standard errors took into account repeated observations of the same individual.
[b]Significant at the 1% level.

Philipson TJ et al. Am J Manag Care 2013; 19:121-128

Impact of Oral Nutritional Supplementation on Hospital Outcomes

Table 4. Effect of ONS Use on Episode Cost[a]

	Regression Specification					
	(1)	(2)	(3)	(4)	(5)	(6)
Subset of Matched Sample Analyzed	**All**	**All**	**Follow-up at least 1 d**	**Follow-up 1 d to 3 y**	**Follow-up 1 d to 2 y**	**Follow-up 1 d to 1 y**
Model	OLS	IV	IV	IV	IV	IV
Effect of any ONS use on episode cost (SE)	$7598[b] ($9.70)	−$4734[b] ($10.07)	−$3694[b] ($10.47)	−$4473[b] ($11.69)	−$4873[b] ($12.5)	−$5519[b] ($14.25)
Predicted episode cost without ONS	$14,998	$21,950	$20,664	$21,522	$22,028	$22,950
Predicted episode cost with ONS	$22,596	$17,216	$16,969	$17,049	$17,155	$17,431
Change due to ONS use	50.7%	−21.6%	−17.88%	−20.78%	−22.12%	−24.0%
Observations, n	1,160,088	1,160,088	862,960	735,636	670,823	566,682

IV indicates instrumental variables; OLS, ordinary least squares; ONS, oral nutritional supplement; SE, standard error.
[a]Regression results were from a sample of ONS episodes matched 1:1 to non-ONS episodes on propensity to receive ONS. Terminal episodes and tube-fed episodes were excluded. The dependent variable in the regressions was log of episode cost. Costs are in 2010 dollars. The instrument was the fraction of episodes in a given hospital in a given quarter involving ONS use. Predicted episode costs used Duan's smearing estimator. Standard errors took into account repeated observations of the same individual.
[b]Significant at the 1% level.

Philipson TJ et al. Am J Manag Care 2013; 19:121-128

LESS IS MORE

Trends in the Overuse of Ambulatory Health Care Services in the United States

Minal S. Kale, MD; Tara F. Bishop, MD, MPH; Alex D. Federman, MD, MPH; Salomeh Keyhani, MD, MPH

Table 3. Comparison of Underuse, Overuse, and Misuse in 1999 to 2009

Variable	% (95% CI) 1999	% (95% CI) 2009	*P* Value
Underuse measures group			
Antithrombotic therapy for AF	45.9 (33.4-59.0)	71.9 (66.5-76.7)	<.01
ACE inhibitor use for CHF	44.8 (37.6-52.4)	41.6 (37.4-45.9)	.47
Aspirin use for CAD	28.4 (22.4-35.3)	64.5 (60.2-68.5)	<.01
BB in CHF	20.6 (11.8-33.4)	59.7 (53.8-65.4)	<.01
BB in CAD	28.1 (22.1-35.2)	55.2 (51.7-58.8)	<.01
Antiplatelet use for stroke	51.0 (36.7-65.2)	48.7 (41.1-56.3)	.78
Statin in CAD	26.8 (19.7-35.2)	58.6 (54.1-63.0)	<.01
Statin in DM	12.1 (9.23-15.57)	36.2 (33.4-39.2)	<.01
Pharmacologic therapy for osteoporosis	35.3 (23.6-48.9)	45.1 (37.8-52.7)	.21
Overuse measures group			
Prostate cancer screening in men aged >74 y	3.5 (2.4-5.1)	5.7 (4.6-7.0)	.03
Screening EKG in adults in GME	6.1 (3.1-11.5)	11.3 (5.9-20.8)	.20
Screening UA in adults in GME	39.9 (29.5-51.4)	25.3 (17.2-35.6)	.05
Screening x-ray in adults in GME	4.7 (2.4-9.1)	7.0 (3.2-14.5)	.47
Screening CBC in adults in GME	22.3 (13.1-35.3)	37.9 (26.8-50.6)	.08
Cervical cancer screening in women aged >65 y	3.1 (2.6-3.8)	2.2 (1.8-2.7)	.02
Mammography screening for women aged >74 y	2.1 (1.5-3.0)	2.6 (2.0-3.5)	.35
Imaging for back pain in adults aged >18 y	19.1 (15.2-24.1)	22.8 (18.4-27.9)	.25
Abx for URI	37.8 (34.4-41.3)	40.2 (36.6-43.9)	.36
Abx for acute bronchitis	60.8 (51.4-69.5)	58.8 (47.3-69.4)	.78
Abx for asthma	22.3 (13.9-33.9)	6.8 (4.9-9.3)	.01
Misuse measures group			
Abx other than nitrofurantoin/trimethoprim/quinolone use for UTI	24.9 (18.1-33.2)	2.7 (1.2-5.7)	<.01
Inappropriate meds in the elderly	6.5 (5.8-7.3)	7.2 (6.3-8.1)	.29

Abbreviations: Abx, antibiotics; ACE, angiotensin-converting enzyme; AF, atrial fibrillation; BB, β-blocker; CAD, coronary artery disease; CBC, complete blood count; CHF, congestive heart failure; DM, diabetes mellitus; EKG, electrocardiogram; GME, general medical examination; UA, urinalysis; URI, upper respiratory tract infection; UTI, urinary tract infection.

JAMA Intern Med 2013; 173:142-148

Conclusions

- Malnutrition is a negative prognostic factor.
- Medical Nutrition improves nutritional status.
- Medical Nutrition improves clinical outcome.
- The use of ONS has been demonstrated cost-effective in different clinical settings.
- In the next future, trials of medical nutrition should be based:
  - adequate statistical power
  - clinically relevant outcomes
  - cost-effective assessment


Thank you.