Lange termijn opvolging na bariatrische heelkunde

Dr Eveline Dirinck

Department of endocrinology

Antwerp University Hospital

Programma

- Macro-nutriënten
- Micro-nutriënten
- Beweging
- Rookstop
- Medicatie absorptie
- Opvolging diabetes
- Lange termijn complicaties

AACE/TOS/ASMBS Guidelines

Clinical Practice Guidelines for the Perioperative Nutritional, Metabolic, and Nonsurgical Support of the Bariatric Surgery Patient—2013 Update: Cosponsored by American Association of Clinical Endocrinologists, The Obesity Society, and American Society for Metabolic & Bariatric Surgery*

Jeffrey I. Mechanick, M.D.[1], Adrienne Youdim, M.D.[2], Daniel B. Jones, M.D., M.S.[3], W. Timothy Garvey, M.D.[4], Daniel L. Hurley, M.D.[5], M. Molly McMahon, M.D.[5], Leslie J. Heinberg, Ph.D.[6], Robert Kushner, M.D.[7], Ted D. Adams, Ph.D., M.P.H.[8], Scott Shikora, M.D.[9], John B. Dixon, M.B.B.S., Ph.D.[10] and Stacy Brethauer, M.D.[11]

Obesity

Endocrine and Nutritional Management of the Post-Bariatric Surgery Patient: An Endocrine Society Clinical Practice Guideline

David Heber, Frank L. Greenway, Lee M. Kaplan, Edward Livingston, Javier Salvador, and Christopher Still

nature publishing group

PERIOPERATIVE BARIATRIC GUIDELINES
A SUPPLEMENT TO *OBESITY*

ELSEVIER

AND RELATED DISEASES

Surgery for Obesity and Related Diseases 4 (2008) S73-S108

ASMBS Guidelines

ASMBS Allied Health Nutritional Guidelines for the Surgical Weight Loss Patient

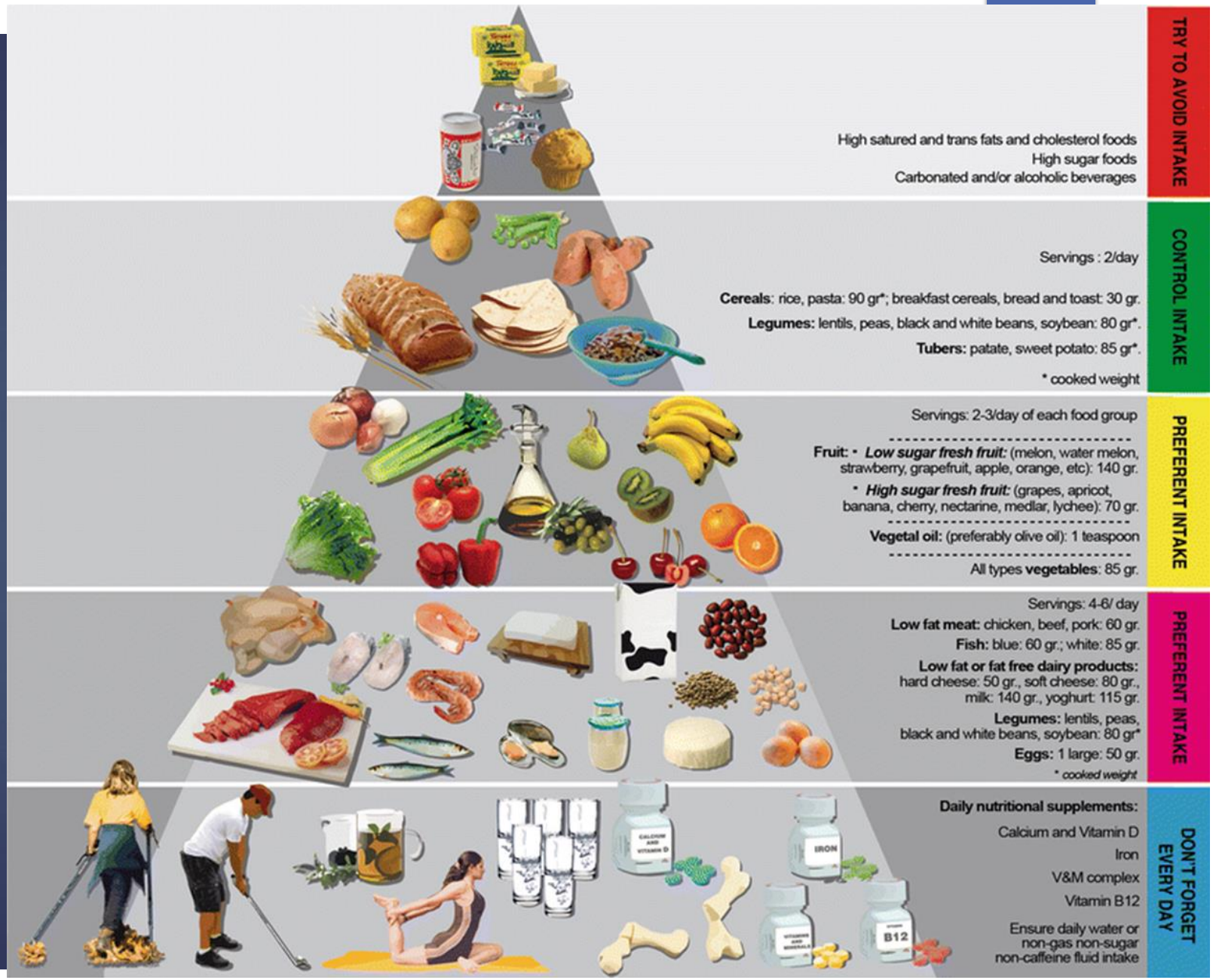
Allied Health Sciences Section Ad Hoc Nutrition Committee:
Linda Aills, R.D. (Chair)[a], Jeanne Blankenship, M.S., R.D.[b], Cynthia Buffington, Ph.D.[c], Margaret Furtado, M.S., R.D.[d], Julie Parrott, M.S., R.D.[e,*]

AACE/TOS/ASMBS Guidelines

AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS, THE OBESITY SOCIETY, AND AMERICAN SOCIETY FOR METABOLIC & BARIATRIC SURGERY MEDICAL GUIDELINES FOR CLINICAL PRACTICE FOR THE PERIOPERATIVE NUTRITIONAL, METABOLIC, AND NONSURGICAL SUPPORT OF THE BARIATRIC SURGERY PATIENT

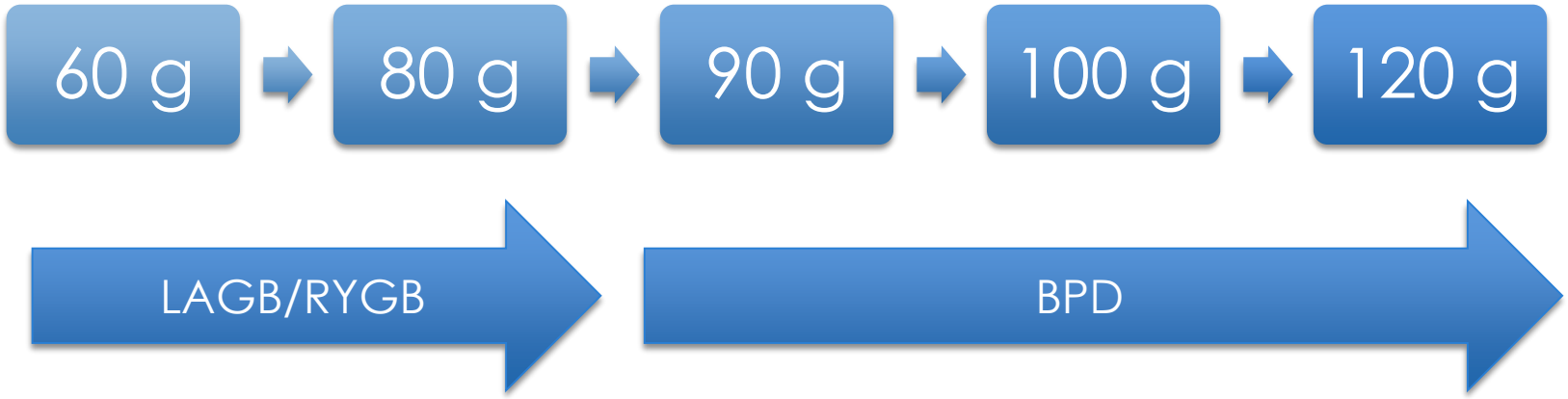
Jeffrey I. Mechanick, MD, FACP, FACE, FACN, Robert F. Kushner, MD, Harvey J. Sugerman, MD, J. Michael Gonzalez-Campoy, MD, PhD, FACE, Maria L. Collazo-Clavell, MD, FACE, Adam F. Spitz, MD, FACE, Caroline M. Apovian, MD, Edward H. Livingston, MD, FACS, Robert Brolin, MD,

MACRO-nutriënten



Eiwit behoefte

0,8 tot 2,1 g/kg



Heber et al., 2010; Mechanick et al., 2009, Mechanik et al., 2013

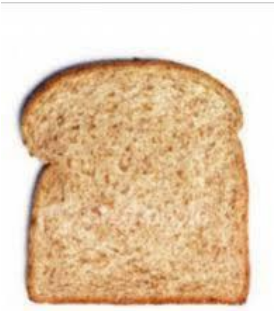
Eiwit bronnen

biefstuk: 18,0 g/100 g

kabeljauw: 16,4 g/100g

Tofu: 12 g/100 g

Glas melk: 4,8g/150g



Snee brood: 2,8 g/30 g

Snee kaas: 9,7 g/33 g

Ei: 8,8 g/stuk

Yoghurt : 6,3 g/potje

Ewit supplementen (indien eiwitinname < 60 g/dag)

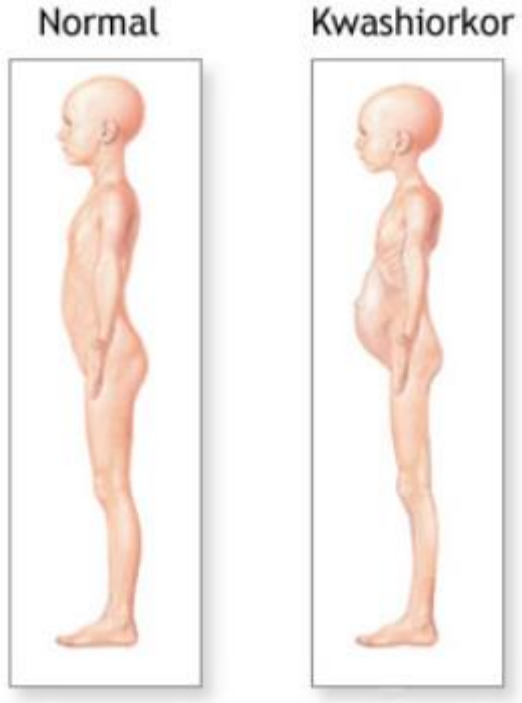
- Essentiële aminozuren aanwezig in adequate hoeveelheid
- Supplementen op basis van wei-eiwitten:
  - Goede kwaliteit (hoog gehalte aan vertakte keten aminozuren)
  - Blijven oplosbaar in maag
  - Worden snel verteerd
- Maaltijdvervangers en eiwitrepen
  - Eiwit: mengsel van wei, soja en caseïne
  - Koolhydraten, vezels, vitaminen en mineralen
- Proteïneshakes:
  - Mengsel van plantaardige en dierlijke eiwitten
  - Als aanvulling, niet als enige bron van voeding

Praktische uitwerking van eiwitrijke voeding

- Proteïnen moeten deel uitmaken van elke hoofdmaaltijd
- 20 à 30 g eiwitten per maaltijd
- Ontbijt: belangrijk moment: lichaam in katabole toestand na nacht vasten, verzadigend effect
- Ook proteïnen als tussendoortje ovv melkproducten (+calcium)

Klinische tekenen van eiwitmalnutritie

- Alopecia (haaruitval)
- Verminderde spierkracht
- Anemie
- Verlies van spiermassa
- Kwashkiorkor – oedeem (ascites, enkeloedeem)

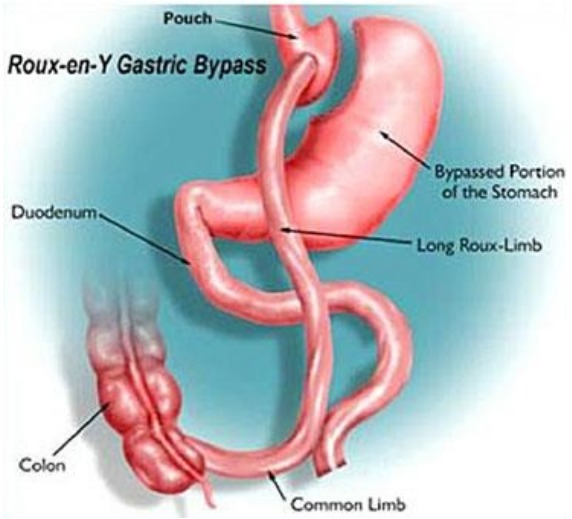


➔Monitoring: pre-albumine, albumine, totaal eiwit, transferrine

➔Impedantie

Prevalantie van eiwit malnutritie

- Afhankelijk van de lengte van de "Roux-lis"
  - 13% na 2 jaar met minimale lis van 150 cm
  - < 5% met lis < 150 cm
  - 3-18 % van patiënten na BPD



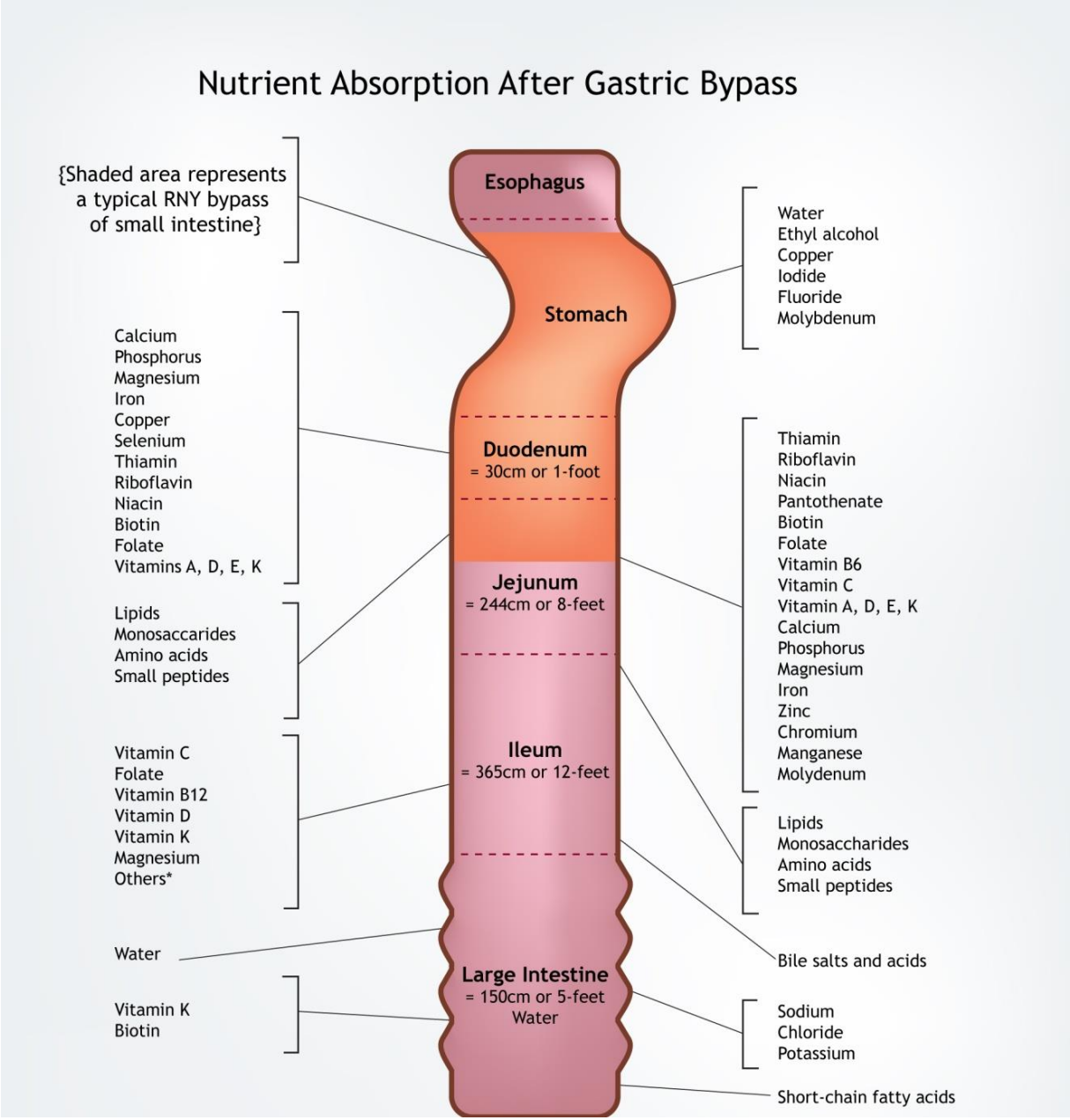
Heber et al., JCEM 2010

Postoperative behavioral variables and weight change 3 years after bariatric surgery

- Decreased intake of calories and fat
- Better dietary adherence
- Denying a snack-eating pattern
- Decreased food urges
- Lower prevalence of grazing

JAMA Surg. 2016 Aug 1;151(8):752-7.
Postoperative Behavioral Variables and Weight Change 3 Years After Bariatric Surgery.
Mitchell JE, Christian NJ, Flum DR, Pomp A, Pories WJ, Wolfe BM, Courcoulas AP, Belle SH.

MICRO-nutriënten



Micronutriënten

Table 14 Routine nutrient supplementation after bariatric surgery[a]

Supplement	Dosage
Multivitamin	1–2 daily
Calcium citrate with vitamin D	1,200–2,000 mg/day + 400–800 U/day
Folic acid	400 µg/day in multivitamin
Elemental iron with vitamin D[b]	40–65 mg/day
Vitamin B_{12}	≥350 µg/day orally
	or 1,000 µg/mo intramuscularly
	or 3,000 µg every 6 mo intramuscularly
	or 500 µg every week intranasally

mo, month.
[a]Patients with preoperative or postoperative biochemical deficiency states are treated beyond these recommendations.
[b]For menstruating women.

FitForMe

Vitamines	Hoeveelheid	RI [1]
Vitamine A	600 µg RE	75%
Vitamine B1	2,75 mg	250%
Vitamine B2	3,5 mg	250%
Niacine (B3)	32 mg NE	200%
Pantotheenzuur (B5)	18 mg	300%
Vitamine B6	0,98 mg	70%
Biotine (B8)	100 µg	200%
Foliumzuur (B11)	600 µg	300%
Vitamine B12	350 µg	14000%
Vitamine C	120 mg	150%
Vitamine D3	75 µg	1500%
Vitamine E	24 mg α-ET	200%
Chroom	160 µg	400%
Koper	3 mg	300%
IJzer	70 mg	500%
Jodium	225 µg	150%
Mangaan	3 mg	150%
Molybdeen	112,4 µg	225%
Selenium	105 µg	191%
Zink	22,5 mg	225%

- "Vitamine A 600 µg 75%
- Vitamine B1 1,1 mg 100%
- Vitamine B2 1,4 mg 100%
- Vitamine B3 (niacine) 16 mg 100%
- Vitamine B5 (pantotheenzuur) 5 mg 83%
- Vitamine B6 1,8 mg 125%
- Foliumzuur 300 µg 150%
- Vitamine B12 2,8 µg 110%#
- Biotine 75 µg 150%# [1]
- Vitamine C 80 mg 100%#
- Vitamine D 10 µg 200%#
- Vitamine E 6 mg 50%#
- Calcium 120 mg 15%#
- Chroom 40 µg 100%#
- IJzer 8,8 mg 63%#
- Jodium 75 µg 50%#
- Koper 1 mg 100%#
- Magnesium 94 mg 25%#
- Mangaan 2 mg 100%#
- Selenium 55 µg 100%#
- Zink 10 mg 100%#
- Ginseng 60 mg# %

“Eender welk multivitamine”

Gespecialiseerd multivitamine

Monitoring

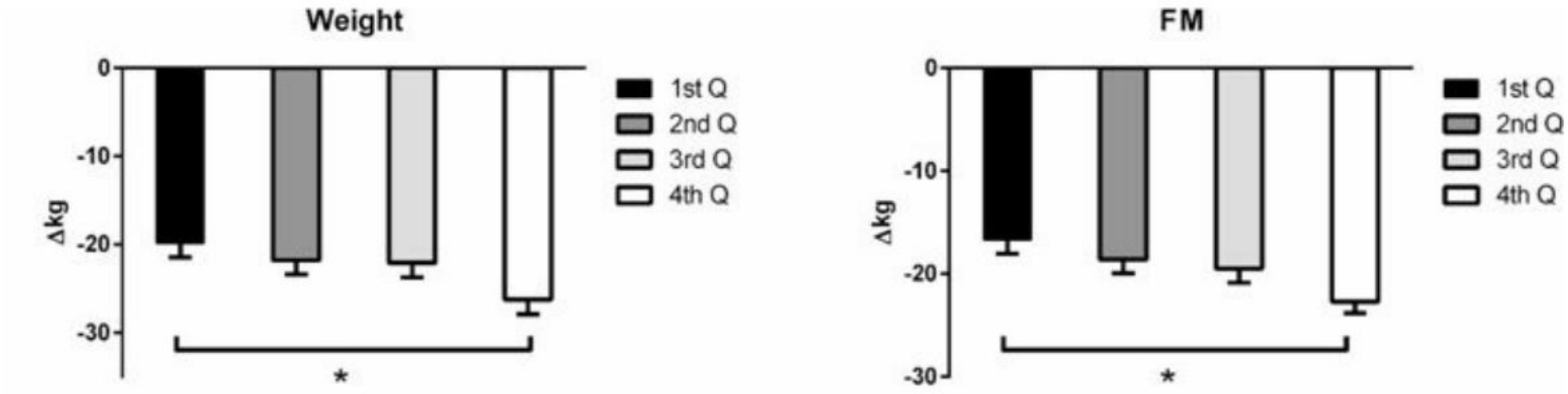
	3 m	6 m	12 m	18 m	24 m	1x/jr
Ionogram Glycemie Transaminasen	X	X	X	X	X	X
Ijzer Saturatie Ferritine	X	X	X	X	X	X
Vitamine B12		X	X		X	X
Foliumzuur (RBC)	X	X	X	X	X	X
Calcium Vitamine D	X	X	X	X	X	X
Parathormoon		X	X		X	X
Botdensiteit			X			X (of om 2 jaar)

Bij deficiënties of klinische verdenking

	3 m	6 m	12 m	18 m	24 m	2x/jr
Vit A,E,K,INR		x	x		x	x
Albumine Pre-albumine	x	x	x	x	x	x
Zn, Se, Mg, Cu		x	x		x	x

Beweging

Beweging



Obesity (Silver Spring). 2017 Jul;25(7):1206-1216. doi: 10.1002/oby.21864. Epub 2017 May 30.
Randomized trial reveals that physical activity and energy expenditure are associated with weight and body composition after RYGB.
Carnero EA, Dubis GS, Hames KC, Jakicic JM, Houmard JA, Coen PM, Goodpaster BH

Beweging

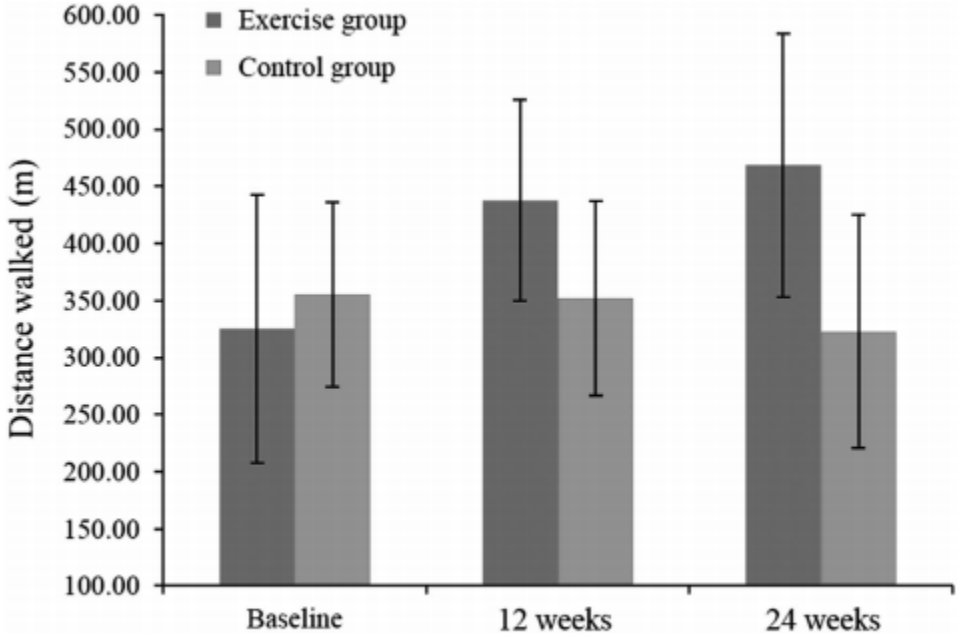


Figure 2. The ISWT in both the exercise training and control groups at baseline, and at 12 and 24 week assessments.

Table 3. Anthropometric measurement changes between baseline and 12 and 24 weeks by trial group

Outcome measures	*Baseline*		*Baseline to 12-week change*			*Baseline to 24-week change*		
	Exercise	*Control*	*Exercise*	*Control*	*P-value*	*Exercise*	*Control*	*P-value*
Body mass (kg)	106.5 ± 16.4	106.0 ± 17.6	−2.4 ± 3.4	1.0 ± 1.4	0.003	−2.7 ± 5.4	2.9 ± 2.9	0.004
BMI (kg m^{-2})	38.2 ± 6.1	39.4 ± 4.3	−0.9 ± 1.2	0.4 ± 0.5	0.003	−1.0 ± 2.0	1.0 ± 1.0	0.004
Body fat (%)	42.0 ± 7.3	45.2 ± 6.0	−1.0 ± 1.1	0.3 ± 0.9	0.004	−0.7 ± 1.5	0.6 ± 1.7	0.061
FM (kg)	45.2 ± 12.9	47.9 ± 10.0	−2.1 ± 2.6	0.9 ± 1.3	0.002	−1.9 ± 4.1	2.1 ± 2.8	0.009
FFM (kg)	61.2 ± 9.3	58.1 ± 12.4	−0.3 ± 1.4	0.2 ± 1.3	0.391	−0.8 ± 1.7	0.8 ± 1.8	0.034
Hip circumference (cm)	131.0 ± 13.2	135.6 ± 11.5	−6.3 ± 8.6	−0.1 ± 2.5	0.026	−7.7 ± 12.5	−0.6 ± 2.1	0.067
Waist circumference (cm)	118.2 ± 11.9	121.1 ± 12.3	−7.53 ± 4.6	−0.58 ± 2.9	< 0.001	−3.9 ± 9.1	0.5 ± 3.0	0.123

Int J Obes (Lond). 2017 Jun;41(6):909-916. doi: 10.1038/ijo.2017.60. Epub 2017 Mar 6.
The effects of supervised exercise training 12-24 months after bariatric surgery on physical function and body composition: a randomised controlled trial.
Herring LY1,2, Stevinson C1, Carter P3,4, Biddle SJH5, Bowrey D2, Sutton C2, Davies MJ4.

Rookstop

Rookstop

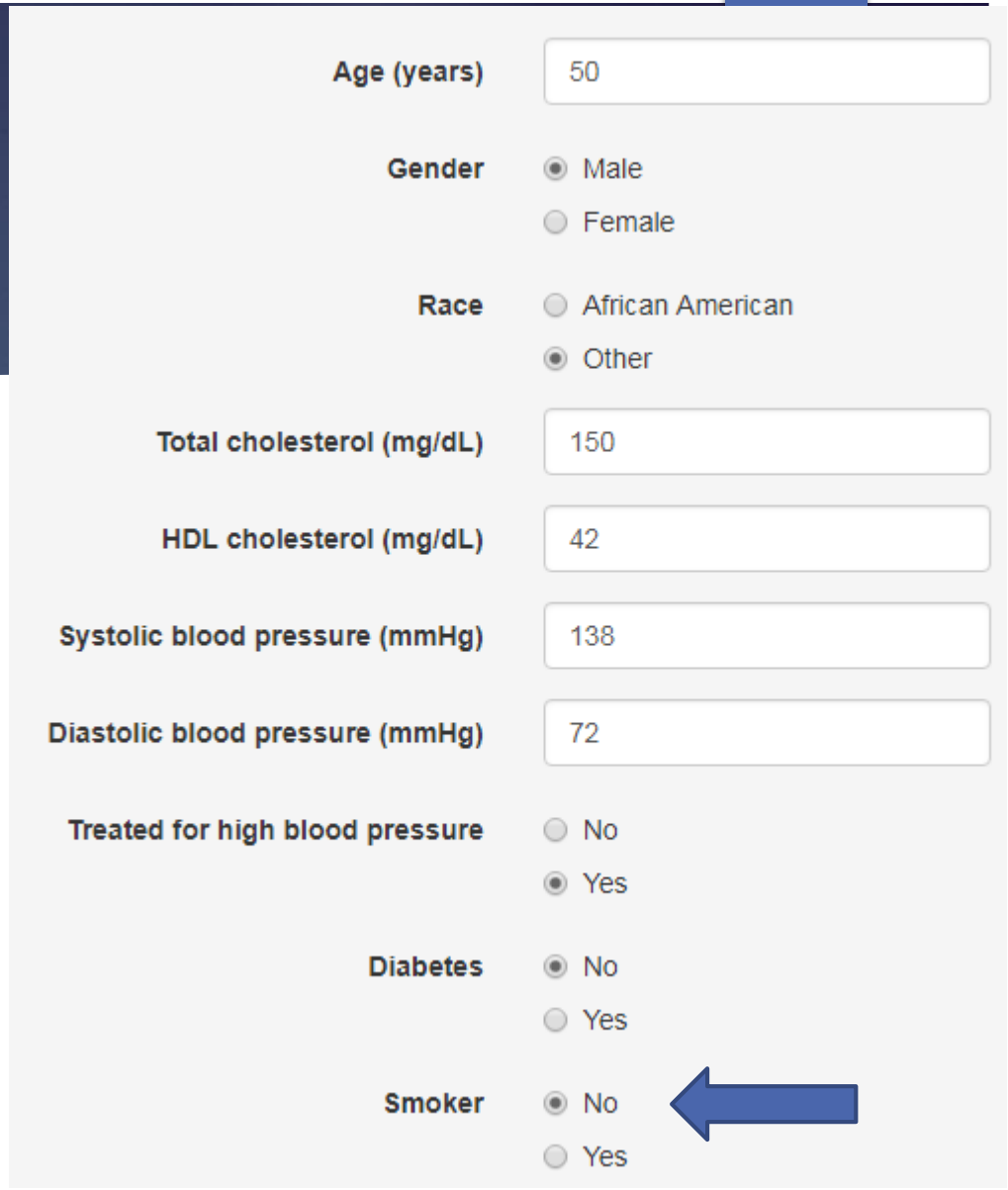
8.2%

10-year risk of heart disease or stroke

Age (years)	50
Gender	(•) Male ( ) Female
Race	( ) African American (•) Other
Total cholesterol (mg/dL)	150
HDL cholesterol (mg/dL)	42
Systolic blood pressure (mmHg)	138
Diastolic blood pressure (mmHg)	72
Treated for high blood pressure	( ) No (•) Yes
Diabetes	(•) No ( ) Yes
Smoker	( ) No (•) Yes

http://www.cvriskcalculator.com/

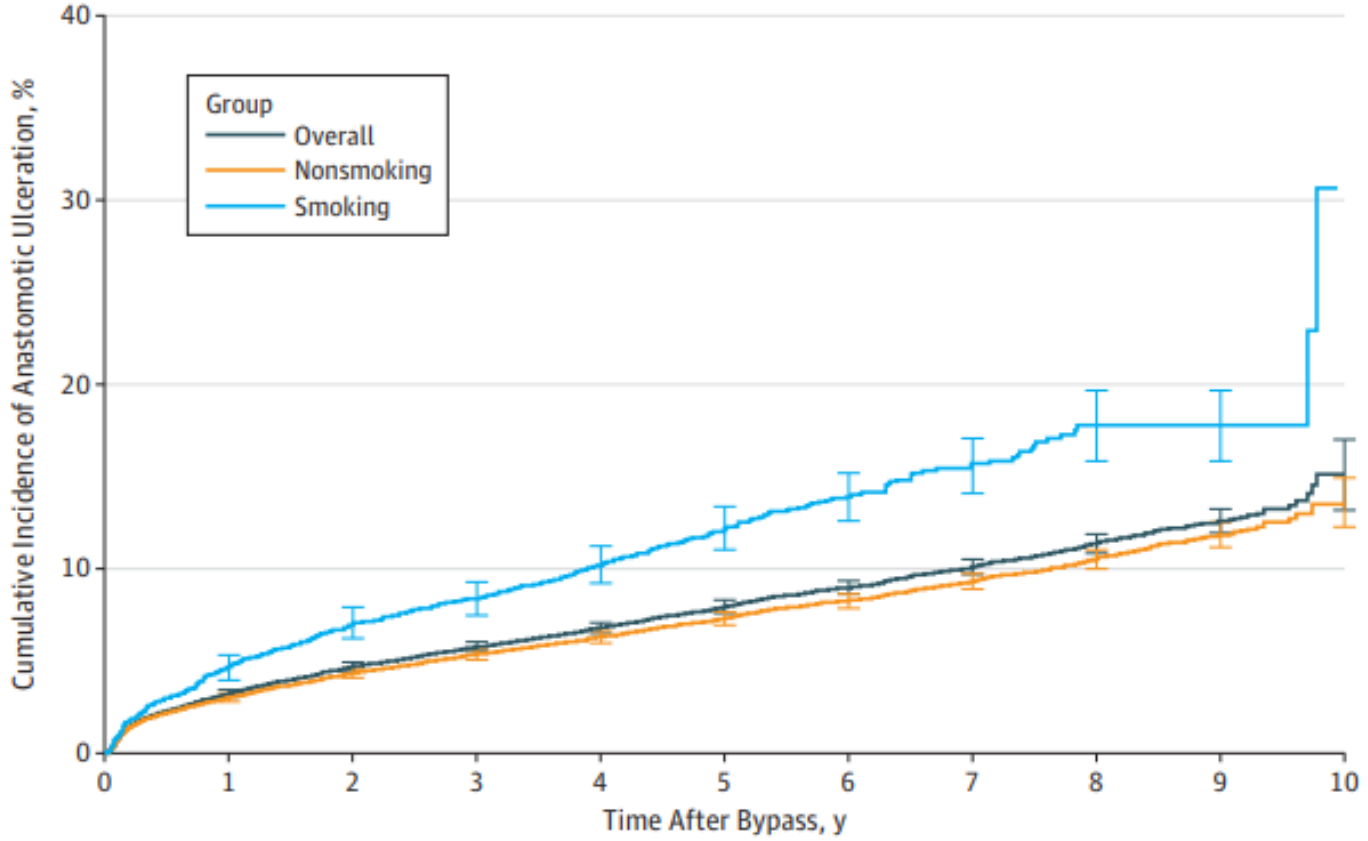
Rookstop



http://www.cvriskcalculator.com/

Rookstop

Figure. Estimated Cumulative Incidence of Anastomotic Ulceration After Roux-en-Y Gastric Bypass



No. of patients at risk

Overall	35074	27008	24775	22446	19190	14778	10734	7202	4085	1494	1
Nonsmoking	30606	23559	21652	19644	16869	13102	9648	6568	3786	1413	1
Smoking	4468	3449	3123	2802	2321	1676	1086	634	299	81	0

JAMA Surg. 2018 Sep 1;153(9):862-864. doi: 10.1001/jamasurg.2018.1616.
Association of Long-term Anastomotic Ulceration After Roux-en-Y Gastric Bypass With Tobacco Smoking.
Spaniolas K1, Yang J2, Crowley S1, Yin D3, Docimo S1, Bates AT1, Pryor AD1.

Rookstop

Table 4 Smoker's distribution according to smoking habit after surgery

Group	Number	%EWL 6 m	%EWL 12 m	%EWL 24 m
A3: active smokers	42	64 ± 18	76 ± 20	74 ± 22
A4: quitters after surgery	20	65 ± 13	81 ± 14	87 ± 15

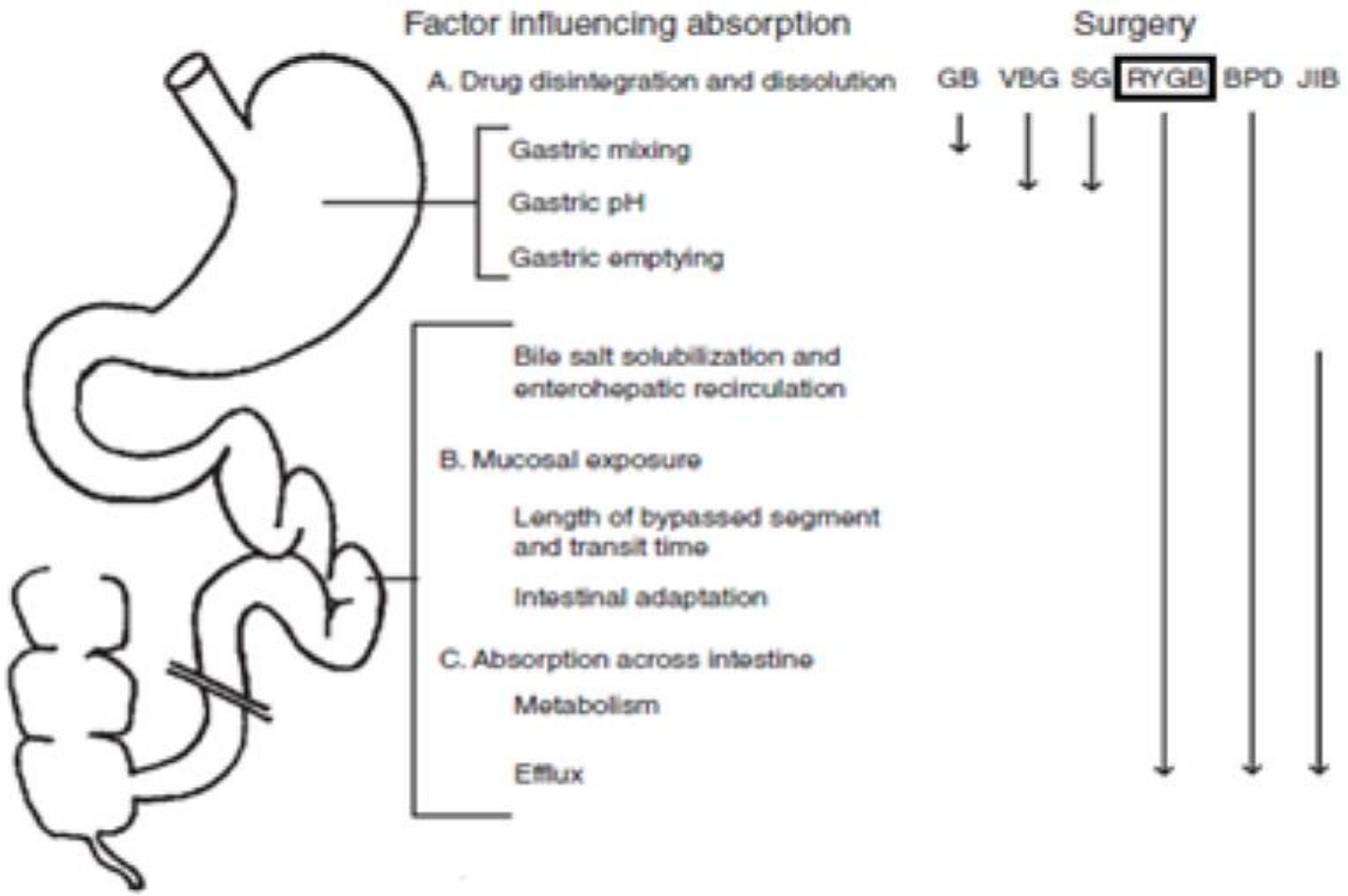
A3 vs. A4: p = NS at any point in time

Obes Surg. 2016 Aug;26(8):1777-81. doi: 10.1007/s11695-015-2000-4.
Relationship Between Tobacco Use and Weight Loss After Bariatric Surgery.
Moser F1, Signorini FJ2, Maldonado PS1, Lopez Sivilat A1, Gorodner V1, Viscido G1, Saleg P1, Obeide LR1.

Medicatie absorptie

Met dank aan Ina GESQUIERE, UZ LEUVEN

farmacokinetiek



farmacokinetiek

Grootte geneesmiddel

- Pletten en volledig innemen
- Siroop
- Bruistabletten (volledig uitgebruisd)
- Instant
- Odis

farmacokinetiek

Verhoogd risico op GI-ulcera na RYGB

- Pijn: **geen NSAID**!
  - ⇒ Trap 1: paracetamol
  - ⇒ Trap 2: tramadol (eventueel gecombineerd met paracetamol)
  - ⇒ Trap 3: Palladone, MS Direct
- Ook geen NSAID in suppo!
- Vermijd orale bisfosfonaten

farmacokinetiek

Formulering: opgelet!

Speciale galenische vormen:

- EC, SR, chrono, LA,...
- Xanthium, ferogradumet,...

⇒ Ontwikkeld voor een normaal GI-stelsel

⇒ Vermijden na RYGB

Medicatie gebruik

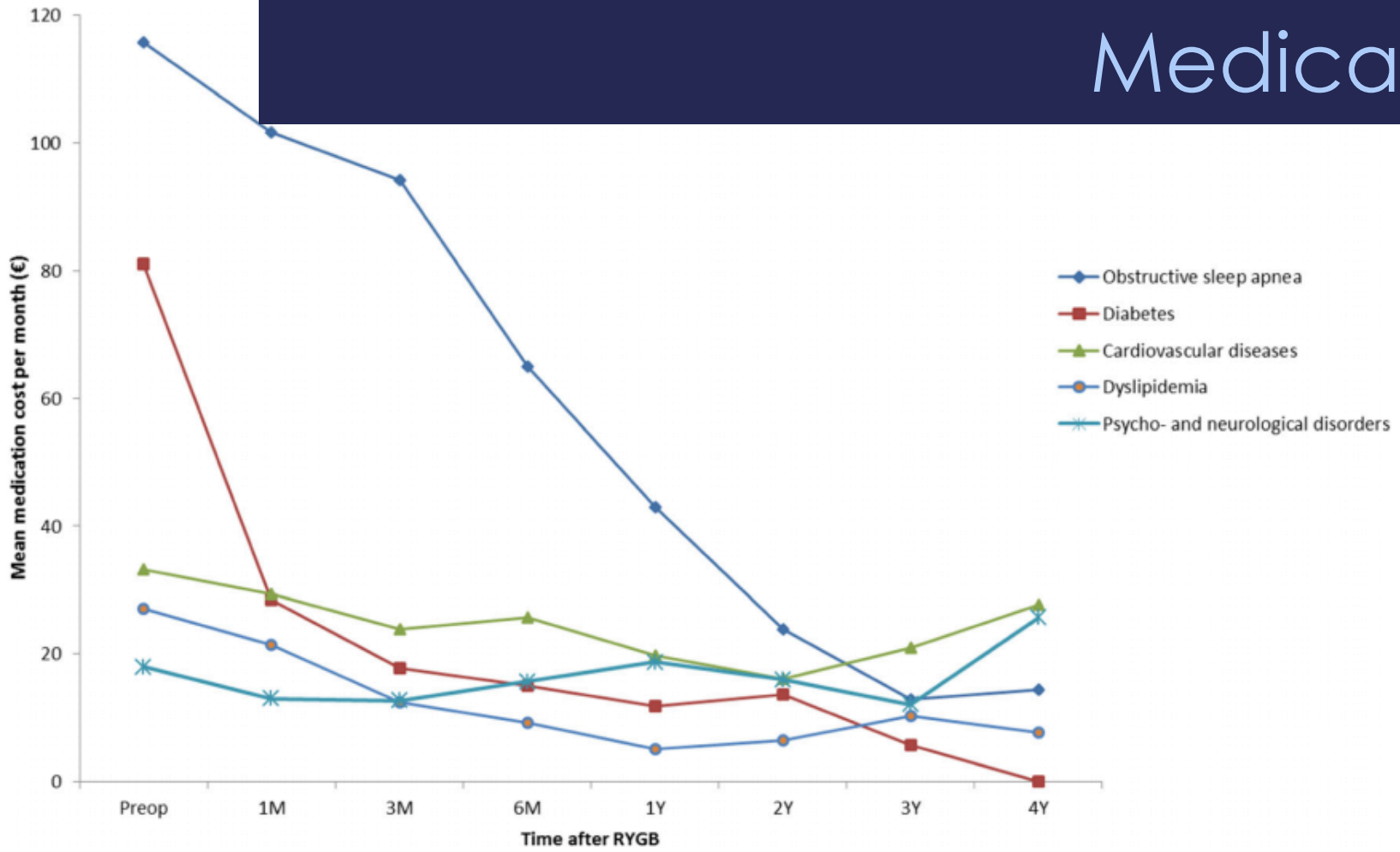


Fig. 3 Mean cost per patient per month for the different comorbidities, among the patients who suffer from the comorbidity (*preop* before surgery, *1 M* 1 month, *1Y* 1 year)

Obes Surg. 2014 Nov;24(11):1896-903. doi: 10.1007/s11695-014-1325-8.
Medication cost is significantly reduced after Roux-en-Y gastric bypass in obese patients.
Gesquiere I1, Aron-Wisnewsky J, Foulon V, Haggege S, Van der Schueren B, Augustijns P, Bouillot JL, Clement K, Basdevant A, Oppert JM, Buyse M.

Anticonceptie

Table 1. Partial recommendations for medical conditions added to the US medical eligibility criteria for contraceptive use [72]

Type of procedure	COC, P, R	POP	DMPA	Implant	LNG IUD	Cu IUD
Restrictive	1	1	1	1	1	1
Malabsorptive	COC: 2; P: 1	2	1	1	1	1

COC = Combined oral contraception; P = patch; R = ring; POP = progestin-only pills; DMPA: depot medroxyprogesterone acetate injection; LNG IUD = levonorgestrel intrauterine device; Cu IUD = copper-bearing intrauterine device; 1 = a condition for which there is no restriction for the use of contraceptive method; 2 = a condition for which the theoretical or proven risks usually outweigh the advantages of using the method.

Obes Facts. 2017;10(2):118-126. doi: 10.1159/000449508. Epub 2017 Apr 22.
Oral Contraceptives after Bariatric Surgery.
Schlatter J1.

Diabetes opvolging

Diabetes opvolging

Geen genezing maar remissie van de diabetes indien:

- > 15% gewichtsverlies
- Perfecte metabole controle (HbA1c < 6%)
- Zonder hypoglycemie
- Perfecte cholesterol
  - totaal < 154 mg/dL
  - LDL < 70 mg/dL
  - Triglyceriden < 150 mg/dL
- Perfecte bloeddruk (< 135/85 mmHg)
- Zonder of met minder medicatie

Diabetes medication long term

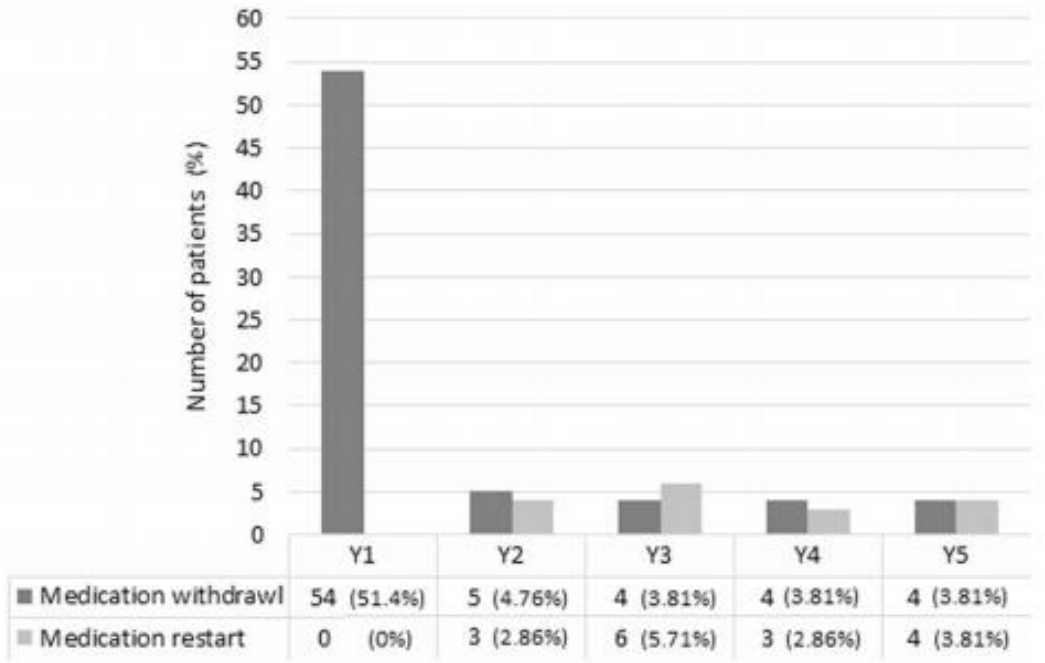
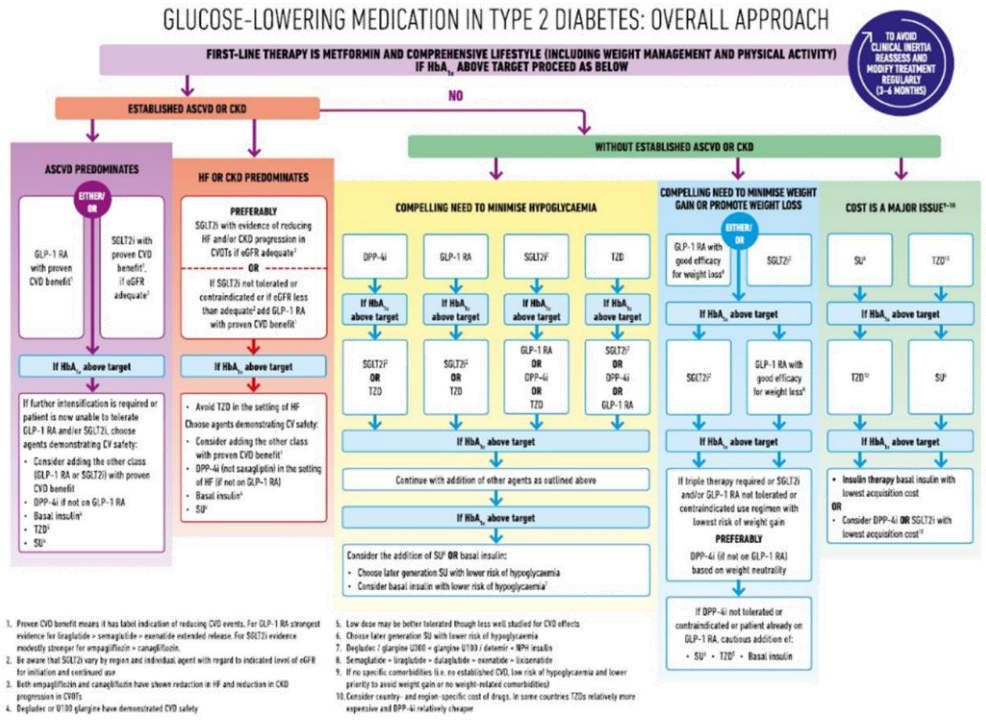


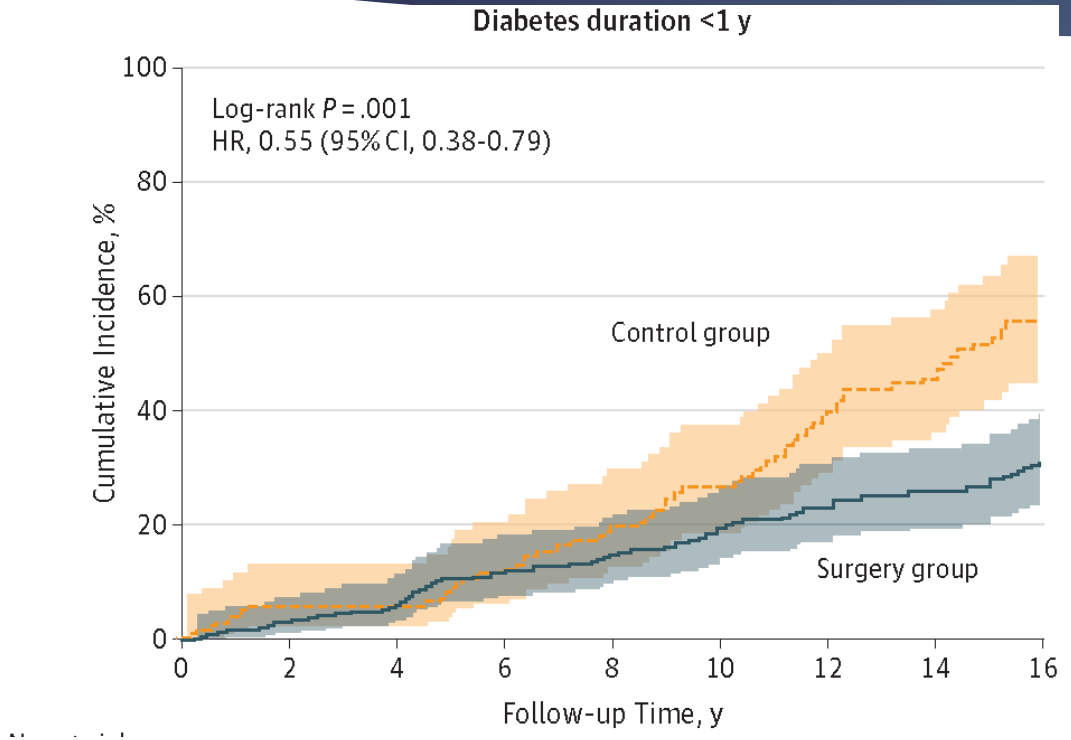
Fig. 2 Anti-diabetic medication withdrawal and restart throughout the 5 years of follow-up

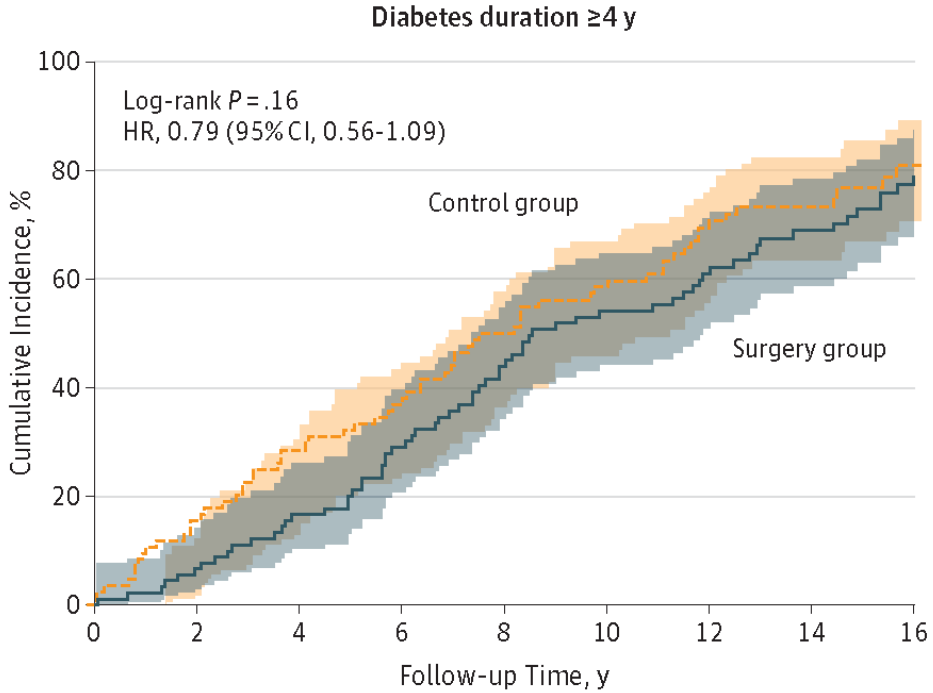
Int J Obes (Lond). 2019 Jan 29. doi: 10.1038/s41366-019-0320-5.
Long-term diabetes outcomes after bariatric surgery-managing medication withdrawl.
Souteiro P, Belo S, Magalhães D, Pedro J, Neves JS, Oliveira SC, Freitas P, Varela A, Carvalho D, Multidisciplinary Group for Surgical Management of Obesity.

Diabetes medication long term



Diabetes complications





Blijf screenen naar microvasculaire complicaties bij reeds gekende diabeten!!

Long term complicaties

Dumping


HYPO
Duizeligheid
Beven
Wisselend humeur
Moeheid
Wazig zien
Honger
Bleekheid
Hoofdpijn
Zweten

Dumping

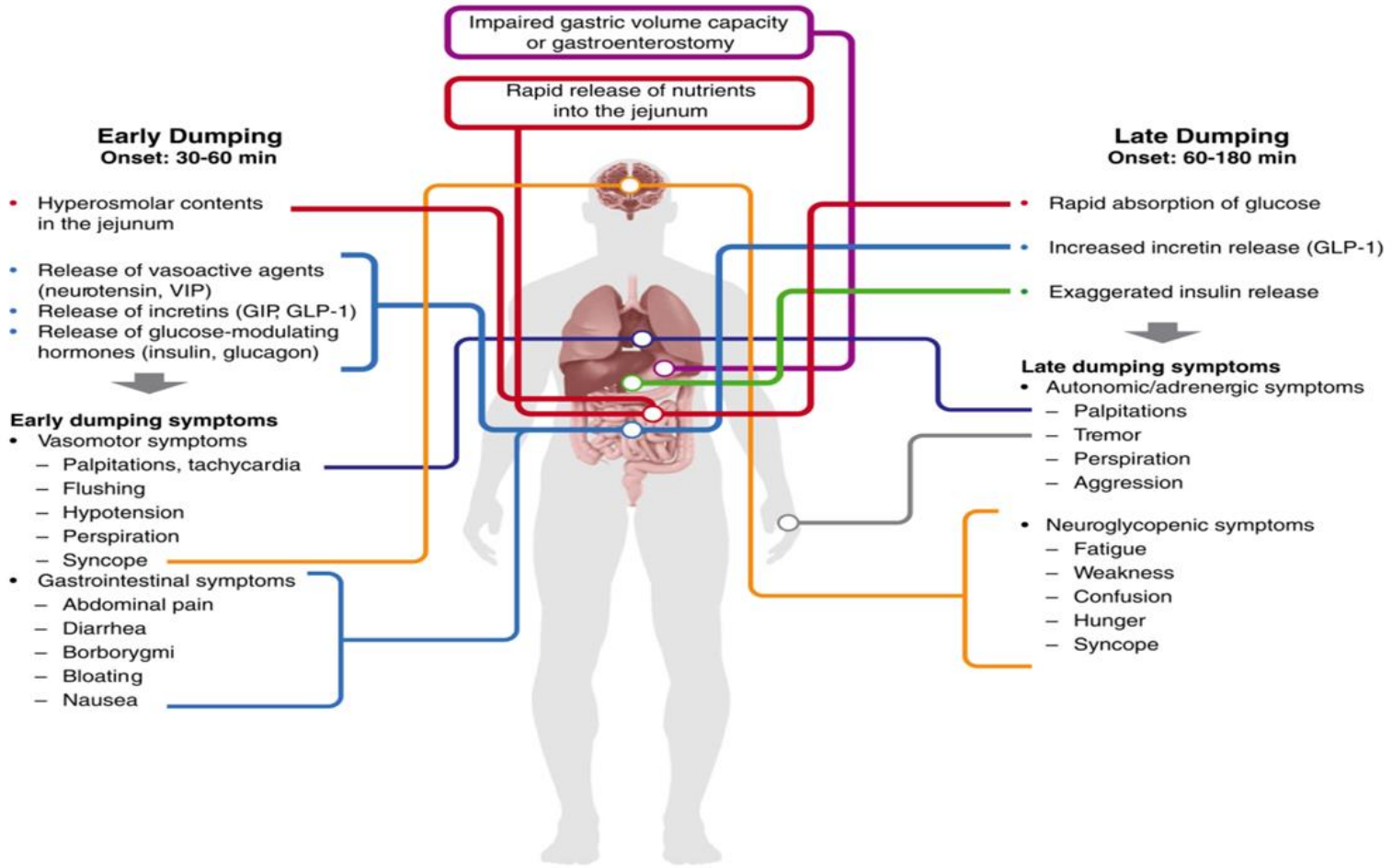
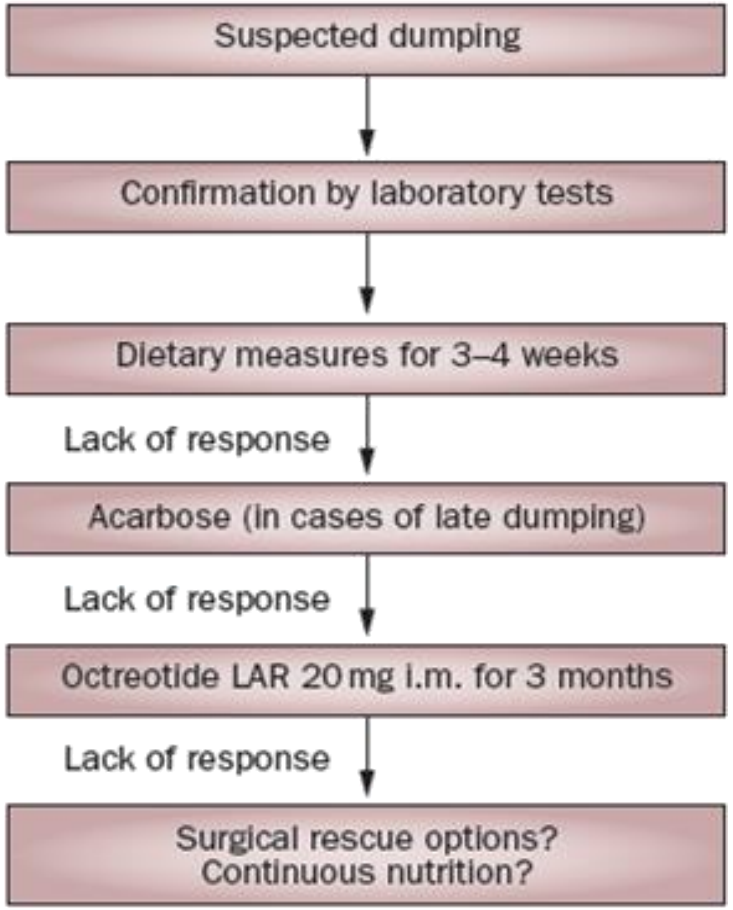


Figure 1 Pathophysiology of dumping syndrome. Abbreviations: GIP, gastric inhibitory polypeptide; GLP-1, glucagon-like peptide-1; VIP, vasoactive in-

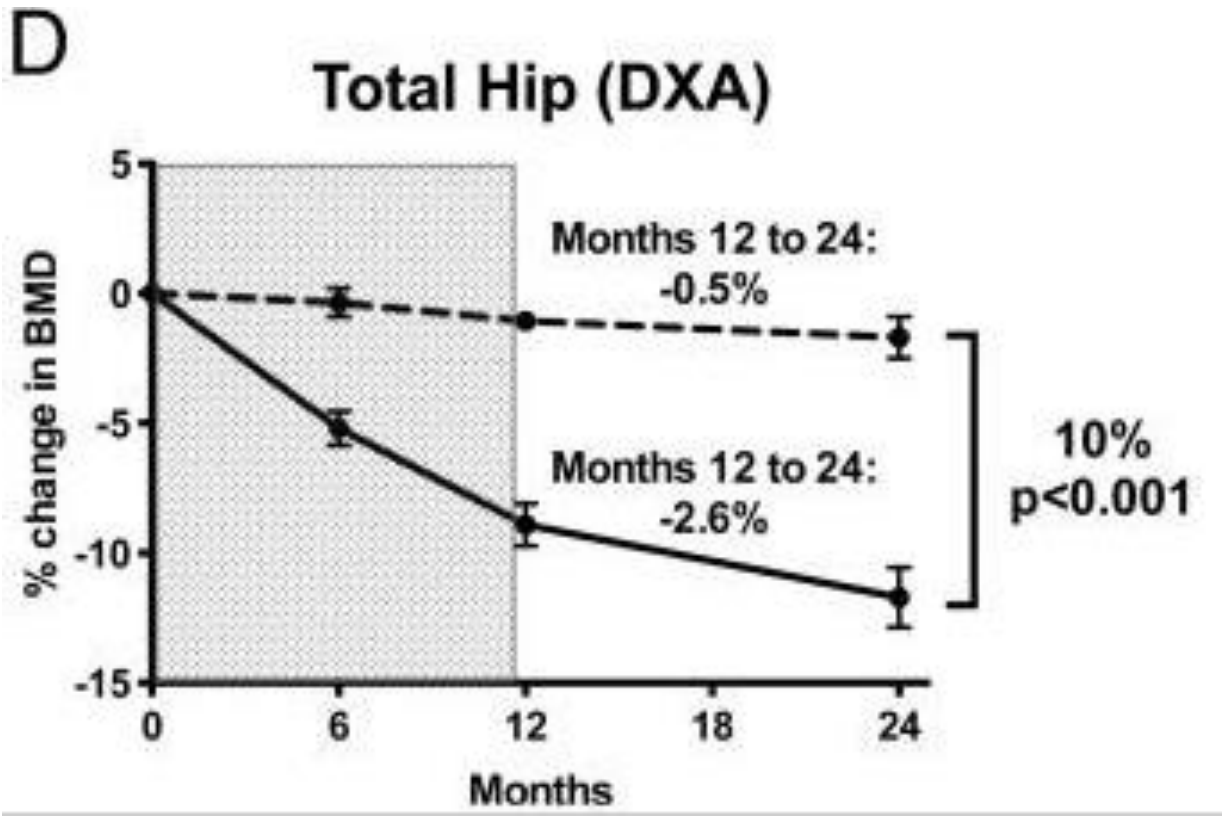
Dumping - Therapie

- Voeding!!!
  - Verspreide eiwitrijke maaltijden
  - Maïszetmeel / pectine / guar gum
  - Trage koolhydraten (max 30g)
  - Lactose
  - Vocht
  - Rust

→ **3-5% continueren van ernstige symptomen**



Osteoporose



J Clin Endocrinol Metab. 2015 Apr;100(4):1452-9. doi: 10.1210/jc.2014-4341. Epub 2015 Feb 3.
Two-year changes in bone density after Roux-en-Y gastric bypass surgery.
Yu EW1, Bouxsein ML, Putman MS, Monis EL, Roy AE, Pratt JS, Butsch WS, Finkelstein JS.

Osteoporose

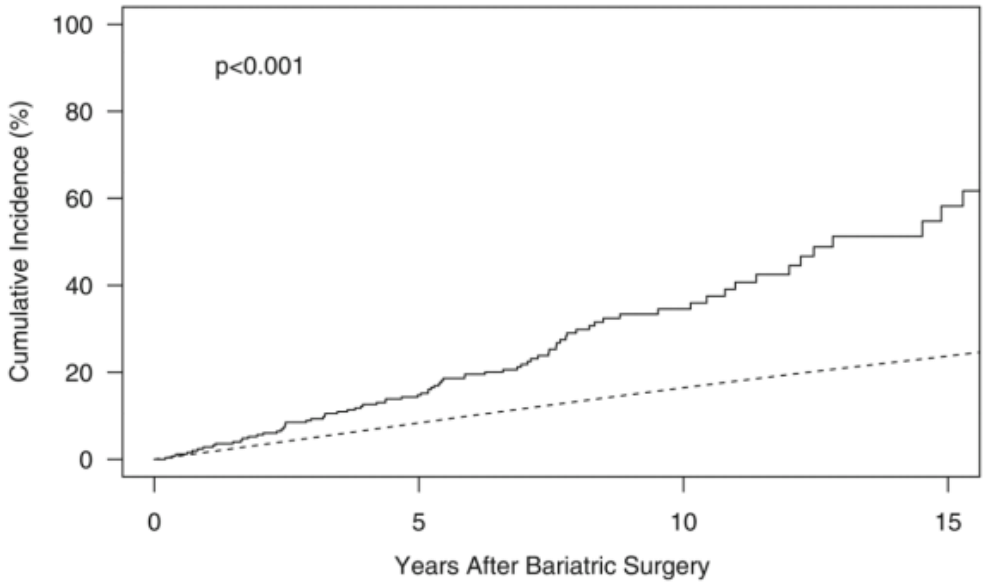


Fig. 1.
Cumulative incidence of fracture among Olmsted County, Minnesota, residents following bariatric surgery in 1985–2004 (*solid line*) vs. expected incidence among community men and women (*dashed line*)

Osteoporos Int. 2014 Jan;25(1):151-8. doi: 10.1007/s00198-013-2463-x. Epub 2013 Aug 3.
Fracture risk following bariatric surgery: a population-based study.
Nakamura KM1, Haglind EG, Clowes JA, Achenbach SJ, Atkinson EJ, Melton LJ 3rd, Kennel KA.

Lange termijn complicaties

- Anastomose stenose (6-20%)
- Maag / anastomose - ulcus
- Cholelithiase
- oxalaat nefrolithiase
- Interne herniaties / volvulus

Programma

- Macro-nutriënten
- Micro-nutriënten
- Beweging
- Rookstop
- Medicatie absorptie
- Opvolging diabetes
- Lange termijn complicaties