studiedag bariatrie in de 1ste lijn

operaties

20 maart 2023

LET'S TALK ABOUT OBESITY

studiedag bariatrie in de 1ste lijn

Ronald Liem

20 maart 2023

LET'S TALK ABOUT OBESITY SURGERY

- bariatrisch chirurg
- directeur NOK Den Haag & Gouda
- bestuurslid DATO (DICA)
- lid richtlijncommissie behandeling obesitas bij volwassenen (2020-heden)
- IFSO:
  - vicevoorzitter Registry Committee
  - voorzitter MNAG/lid Executive Committee EC

disclosures

- spreker/onderwijs vergoedingen:
  - Johnson & Johnson
  - Medtronic
- research grants:
  - Medtronic: IMI SOPHIA: Innovative Medicines Initiative – Stratification of Obesity Phenotypes to Optimize Future Therapy
- aandeelhouder Nederlandse Obesitas Kliniek Den Haag & Gouda

obesitas wereldwijd

Obesitas neemt wereldwijd toe en inspanningen om dit aan te pakken zijn uitdagend vanwege misvattingen over obesitas en de rol die het speelt in de gezondheid van een persoon.

1.9	$4.32	100%	1
MILJARD	BILJOEN	TOENAME	IN 4
The number of people around the world that will be living with obesity in 2035.	The estimated global economic impact of overweight and obesity in 2035.	Childhood obesity is expected to increase by 100% between 2020 and 2035.	It is expected that 1 in 4 of us will be living with obesity by 2035.

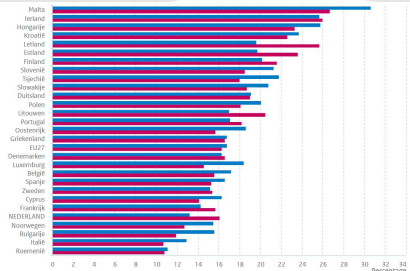
obesitas wereldwijd

- obesitas treft wereldwijd
  - 1 op de 6 volwassenen
  - 1 op de 11 kinderen
- nadelige gevolgen voor de lichamelijke en geestelijke gezondheid
- onvoldoende toegang tot gezondheidsondersteuning

obesitas wereldwijd

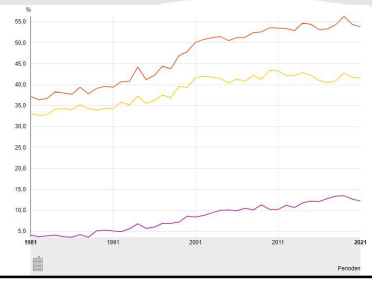
- obesitas treft wereldwijd
  - 1 op de 6 volwassenen
  - 1 op de 11 kinderen
- nadelige gevolgen voor de lichamelijke en geestelijke gezondheid
- onvoldoende toegang tot gezondheidsondersteuning
- schadelijk stigma

obesitas in Europa



obesitas in Nederland

>20 jaar
mannen
en vrouwen



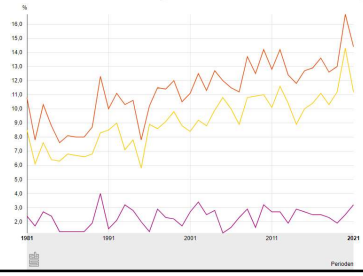
overgewicht + obesitas

overgewicht

obesitas

obesitas in Nederland

<20 jaar
mannen
en vrouwen

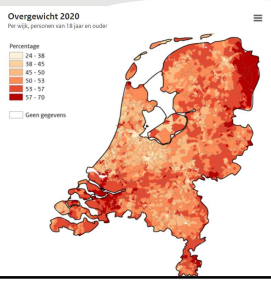


overgewicht + obesitas

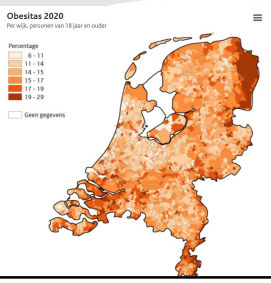
overgewicht

obesitas

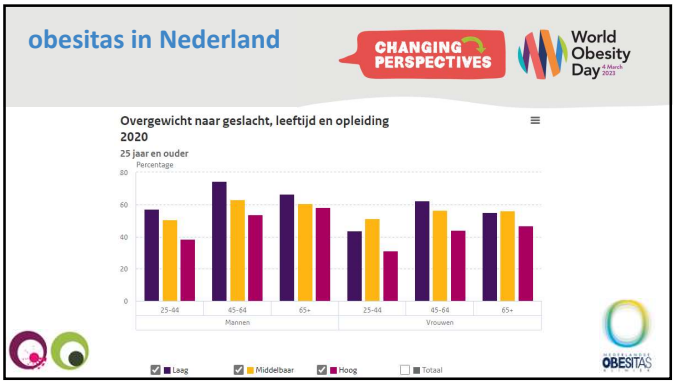
obesitas in Nederland



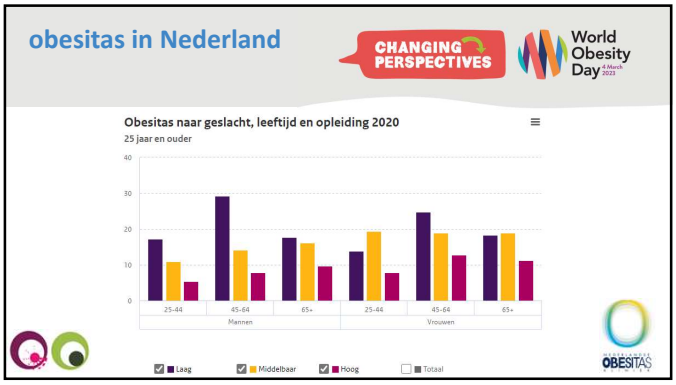
obesitas in Nederland



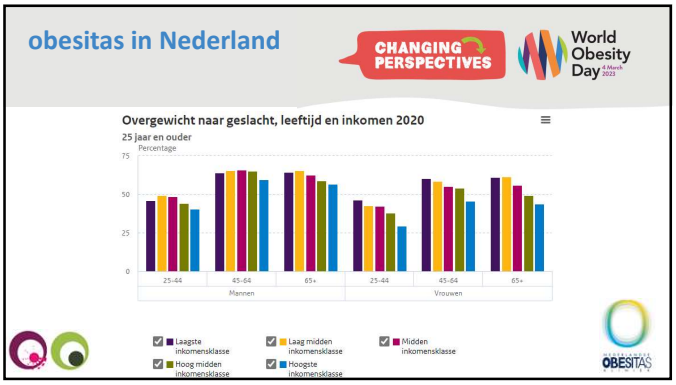
obesitas in Nederland



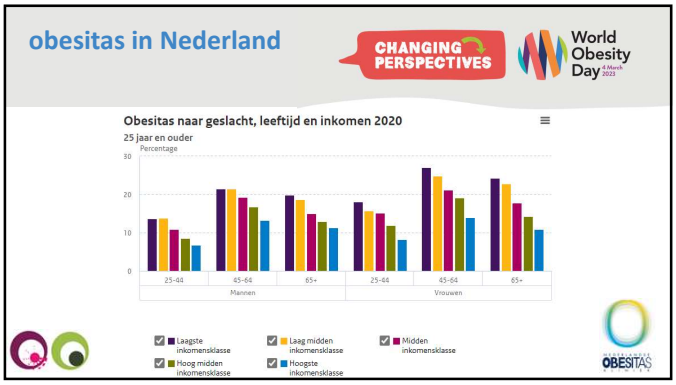
obesitas in Nederland



obesitas in Nederland



obesitas in Nederland



ziektelast (DALY's)
RIVM, VTV-2018

Hoge bloeddruk	6,7%	12,6	5,6
Hoge bloed-suikerspiegel	6,6%	10,2	5,8
Overgewicht	3,7%	4,2	1,5
Cholesterol	0,9%	1,1	0,4
Lage botdichtheid	0,7%	2,9	0,4

ziektelast (DALY's)
RIVM, VTV-2018

	ZIEKTELAST (%)	STERFTE (x1000)	ZORGUITGAVEN € (x miljard)
Roken	9,4%	20,0	2,4
Ongezonde voeding	8,1%	12,9	6,0
Weinig beweging	2,3%	5,8	2,7
Alcohol gebruik	1,5%	1,8	0,9

obesitas

meer dan BMI alleen…

Classification	BMI (kg/m²)	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight (preobese)	25.0–29.9	Mildly increased
Obese	≥30.0	
Class 1	30.0–34.9	Moderate
Class 11	35.0–39.9	Severe
Class 111	≥40.0	Very severe

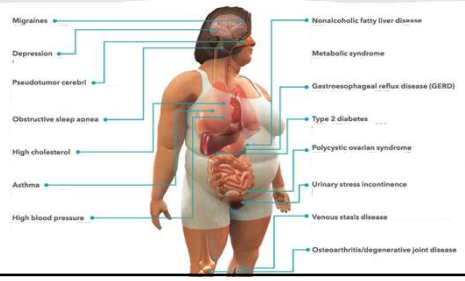
obesitas

buikomvang

- goede indicatie van de hoeveelheid abdominaal vet en totaal lichaamsvet
- wordt gemeten tussen de onderkant van de onderste rib en de bovenkant van het bekken
- normaal: < 80 cm (vrouwen) of < 94 cm (mannen)
- abdominale obesitas: > 88 cm (vrouwen) of > 102 (mannen)

obesitas

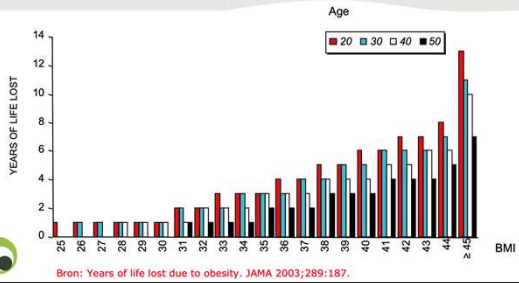
Ook geassocieerde ziekten



obesitas
gezondheidsrisico's

RR>3	RR 2-3	RR 1-2
Diabetes	Coronair lijden	Kanker
Galsteenlijden	Osteoartritis	PCOS
Hypertensie	Hyperuremie	Lage rugklachten
Dyslipidemie		Infertiliteit
OSAS		
NAFLD		
Depressie		
GERD		

obesitas
gezondheidsrisico's



Bron: Years of life lost due to obesity. JAMA 2003;289:187.

gewichtstigma

Gewichtsstigma – een negatieve reactie op iemand op basis van hun gewicht – is de **vierde meest voorkomende vorm van sociale discriminatie** onder volwassenen – na leeftijd, geslacht en ras. Het is de enige vorm van discriminatie die nog algemeen maatschappelijk **aanvaardbaar wordt geacht**.

gewichtstigma

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Gewichtsstigma is een van de meest onbegrepen aspecten van obesitas en wordt vaak genegeerd.

gewichtstigma

Wisten jullie dat:

gewichtstigma

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- Mensen met obesitas eetstoornissen kunnen ontwikkelen

gewichtstigma

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- Gewichtsstigma gewichtstoename kan aanmoedigen
- Stigmatisering vaak wordt begaan door vrienden en familie, niet door vreemden
- Gewichtsbias door individuen kan worden geïnternaliseerd

obesitas
chronische ziekte

- De WHO erkende al in 1948 obesitas als chronische ziekte en werd geïncludeerd in de ICD
- De misvatting dat obesitas een levensstijlkeuze is, die kan worden teruggedraaid door simpelweg wilskracht uit te oefenen, is gecementeerd in de hoofden van het grote publiek **en een groot deel van de medische wereld**.
- obesitas is niet alleen een risicofactor voor ziekten zoals diabetes type2, het is een ziekte op zich
- 2021: Europese Commissie classificeert obesitas als chronische ziekte

determinanten

- gevolg van interactie tussen biologie en omgeving
- sterk veranderende omgevingsfactoren en leefstijl
- erfelijke aanleg en epigenetische veranderingen
- psychisch
- medicamenteus
- hormonaal
- hypothalaam
- monogenetische factoren

diagnostiek

- Vraag toestemming aan de patiënt(e) om het overgewicht te bespreken
- Ga na welke onderliggende oorzaken en/of gewicht verhogende en/of in standhoudende factoren ten grondslag liggen aan het overgewicht
- Bepaal het gewicht gerelateerde gezondheidsrisico (GGR)
- Bespreek intrinsieke motivatie en (zelfmanagement)mogelijkheden
- Bespreek mogelijkheden en stel gezamenlijk met de patiënt een behandelplan op

behandeling

- preventie en zelfmanagement
- gecombineerde leefstijl interventie (GLI)
- gewicht reducerende medicatie:
  - naltrexon/buproprion
  - liraglutide
- chirurgisch gerelateerde technieken
  - Maagballon
  - Endoscopische maagplicatie
- metabole en bariatrische chirurgie
- combinatie therapie

metabole-bariatrische chirurgie - indicatie

BMI> 40 of BMI 35-40 in combinatie met comorbiditeit, oa:

- T2DM, OSAS, CVZ, HT, GERD, gewrichtsklachten (rug/knie/heup)
- Infertiliteit, PCOS
- BMI 30-35 met T2DM
- NAFLD

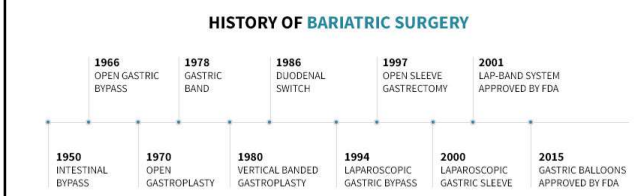
Leeftijd vanaf 18 jaar (jonger in studieverband)

In combinatie met een leefstijlprogramma

metabole-bariatrische chirurgie - indicatie

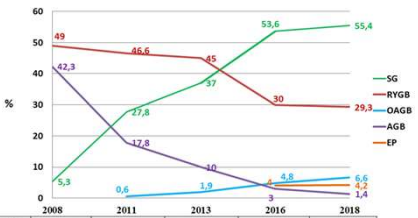
- Aziaten BMI>35 of BMI>32 met co-morbiditeit
- ouder dan 65 jaar: kan, maar met meer complicaties
- jonger dan 18 jaar:
  - 1 jaar centrum
  - meisjes vanaf 13 jaar en jongens vanaf 15 jaar
  - Tanner stadium 4

metabole-bariatrische chirurgie



metabole-bariatrische chirurgie

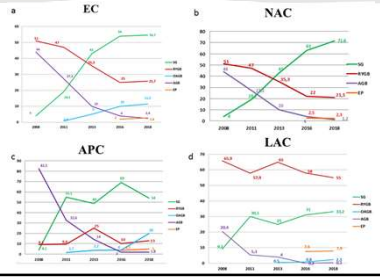
wereldwijde trends



Bariatric procedures (N)	344,221	340,768	468,609	685,874	696,191

metabole-bariatrische chirurgie

wereldwijde trends



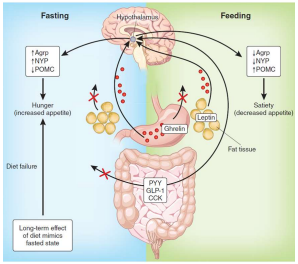
mechanismen

- restrictie
- malabsorptie

mechanismen

- restrictie
- malabsorptie

- hormonaal
- galzuren/zouten
- microbioom



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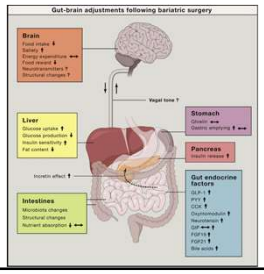

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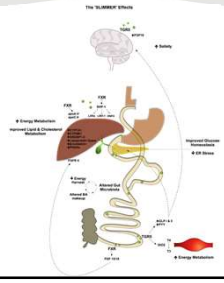
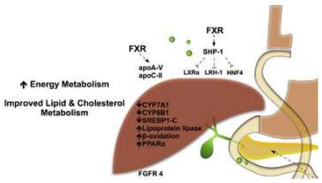


galzuren/zouten

- verhoging plasmaspiegels galzuren
- parallelle veranderingen in compositie
- mechanisme nog niet duidelijk (aanmaak/transport/heropname)
- verbeterd glucosemetabolisme? (FXR, TGR5 -> GLP-1)



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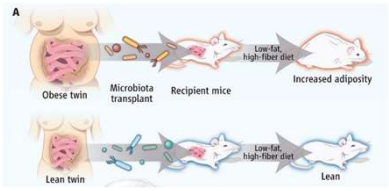


normering

Instituut	chirurg
>200/jr, min 2 chirurgen	startende chirurg >50 ingrepen/proctor
anesthesist >100	>100/jr
MDO	complexe chirurgie en revisie chirurgie
meerdere typen ingrepen	alleen door ervaren chirurg
24/7 (interventie) radiologie	NVGIC certificering
En endoscopie (MDL)	
DATO registratie	

perioperatieve zorg

World J Surg (2022) 46:729–751
https://doi.org/10.1007/s00268-021-06394-9

SCIENTIFIC REVIEW

Guidelines for Perioperative Care in Bariatric Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations: A 2021 Update

Erik Stenberg[1] · Luiz Fernando dos Reis Falcão[2] · Mary O'Kane[3] · Ronald Liem[4,5] · Dimitri J. Pournaras[6] · Paulina Salminen[7,8] · Richard D. Urman[9] · Anupama Wadhwa[10] · Ulf O. Gustafsson[11] · Anders Thorell[12,13]

Accepted: 24 October 2021 / Published online: 4 January 2022

perioperatieve zorg

Table 1 ERAS recommendations for preadmission care in bariatric surgery

Element	Recommendation	Level of evidence	Recommendation grade
1. Information, education and counselling	*Preoperative information and education, adapted to the individual requirements, should be given to all patients*	Low	Strong
2. Indications and contraindications for surgery	*Indications for bariatric surgery should follow updated global and national guidelines*	Moderate	Strong
3a. Smoking and alcohol cessation	*All patients should be screened for alcohol and tobacco use. Tobacco smoking should be stopped at least 4 weeks before surgery. For patients with alcohol abuse, abstinence should be strictly adhered to for 1–2 years. Moreover, the risk for relapse after bariatric surgery should be acknowledged*	Smoking: Moderate Alcohol: Low	Strong Strong
3b. Preoperative weight loss	*Preoperative weight loss using very low or low-calorie diet prior to bariatric surgery should be recommended*	Postoperative complications: Moderate	Strong
	While feasible, patients with diabetes and treatment with glucose-lowering drugs should closely monitor treatment effects, and be aware of the risk for hypoglycaemia. Very low calorie diet improves insulin sensitivity in patients with diabetes	Postoperative weight loss: Low Diabetes: Low	Strong Strong
4. Prehabilitation and exercise	*Although prehabilitation may improve general fitness and respiratory capacity, there is insufficient data to recommend prehabilitation before bariatric surgery*	Low	Weak

perioperatieve zorg

Obesity Surgery (2022) 32:26–32
https://doi.org/10.1007/s11695-021-05760-9

ORIGINAL CONTRIBUTIONS

Impact of Preoperative Weight Loss on Postoperative Weight Loss Revealed from a Large Nationwide Quality Registry

Yentl Lodewijks[1] · Erman Akpinar[2,3] · Gust van Montfort[1] · Simon Nienhuijs[1] · on behalf of the Dutch Audit for Treatment of Obesity Research Group

Received: 16 August 2021 / Revised: 7 October 2021 / Accepted: 11 October 2021 / Published online: 29 October 2021

perioperatieve zorg

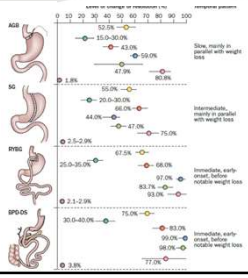
ORIGINAL CONTRIBUTIONS

Impact of Preoperative Weight Loss on Postoperative Weight Loss Revealed from a Large Nationwide Quality Registry

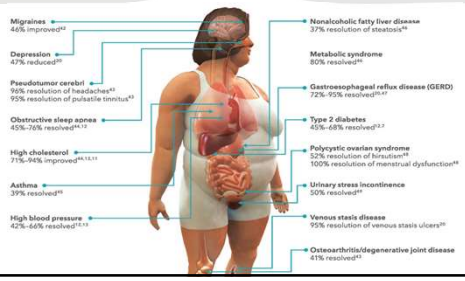
patients with preoperative weight loss were more likely to achieve ≥25% postoperative TWL at 1 and 2 years after surgery

uitkomsten

- Excess weight loss
- Mean weight loss
- Resolution of hypertension
- Improvement of hyperlipidaemia
- Resolution of T2DM
- Improvement of T2DM
- Absolute resolution of HbA_{1c}



uitkomsten



registratie: DATO

Obesity Surgery (2018) 28:1602–1610
https://doi.org/10.1007/s11695-017-3062-2

ORIGINAL CONTRIBUTIONS

A Dutch Nationwide Bariatric Quality Registry: DATO

Youri Q.M. Poelemeijer[1,2] · Ronald S.L. Liem[3] · Simon W. Nienhuijs[4]

Published online: 22 December 2017

Abstract

Introduction In the Netherlands, the number of bariatric procedures increased exponentially in the 90s. To ensure and improve the quality of bariatric surgery, the nationwide Dutch Audit for Treatment of Obesity (DATO) was established in 2014. The audit was coordinated by the Dutch Institute for Clinical Auditing (DICA). This article provides a review of the aforementioned process in establishing a nationwide registry in the Netherlands.

registratie: DATO

		2015	2016	2017	2018	2019	2020	2021
n		10,456	11,594	12,106	11,508	12,298	8,144	9,760
Weight (mean (SD))		124.4 (20.8)	123.5 (20.7)	123.0 (20.7)	123.2 (20.4)	122.7 (20.9)	122.6 (20.7)	122.1 (20.2)
Age (mean (SD))		44.0 (10.9)	44.4 (11.2)	44.7 (11.4)	44.6 (11.7)	45.2 (11.8)	44.4 (12.0)	44.0 (11.9)
Gender (%)	Man	20.2	20.1	20.5	21.1	22.3	21.3	19.5
	Woman	79.8	79.9	79.5	78.9	77.7	78.7	80.5

DICA DATO obesitas

registratie: DATO

		2015	2016	2017	2018	2019	2020	2021
n		10,456	11,594	12,106	11,508	12,298	8,144	9,760
Age category (%)	< 18 years	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18-65 years	99.1	98.9	98.8	98.6	98.1	98.6	98.0
	> 65 years	0.9	1.1	1.2	1.4	1.9	1.4	1.9
	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.1
ASA classification (%)	ASA score < 3	76.4	69.6	51.2	29.6	27.6	23.2	20.8
	ASA score ≥ 3	23.6	30.4	48.8	70.4	72.4	76.8	79.2
BMI (%)	Class I < 35	3.4	3.3	3.7	2.9	3.3	3.7	2.7
	Class II 35-40	23.8	25.9	26.8	27.0	28.7	28.7	30.0
	Class III 40-45	40.7	41.4	41.9	41.8	41.8	41.7	42.6
	Class IV > 45	30.0	28.3	26.3	26.2	25.2	24.7	23.9

DICA DATO obesitas

registratie: DATO

		2015	2016	2017	2018	2019	2020	2021
n		10,456	11,594	12,106	11,508	12,298	8,144	9,760
Procedure (%)	RYGB	74.0	69.1	63.6	59.1	61.4	60.7	61.5
	Sleeve Gastrectomy	16.3	19.1	22.4	24.2	20.8	20.5	20.3
	OAGB	5.2	6.6	8.1	10.2	11.1	9.9	9.8
	Others*	4.4	5.1	5.8	6.5	6.7	8.9	8.3
	NA	0.0	0.1	0.1	0.0	0.0	0.0	0.1

DICA DATO obesitas

registratie: DATO

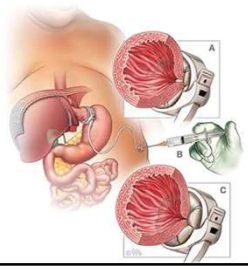
Average postoperative weight (kg)	After 1 year	86.1	84.4	84.4	84.1	83.9	82.9	-
	After 2 years	85.4	83.9	84.2	83.3	83.4	-	-
	After 3 years	87.7	86.3	85.3	85.6	-	-	-
	After 4 years	89.5	86.8	87.1	-	-	-	-
	After 5 years	89.7	88.2	-	-	-	-	-
Clavien-Dindo (%)	No complications/unknown	95.9	96.1	96.2	95.3	95.8	95.6	95.6
	CD 1	0.5	0.6	0.6	1.5	1.0	0.9	0.9
	CD 2	0.3	0.3	0.5	1.2	1.4	1.6	1.5
	Reinterventions (CD-grade III)	2.6	2.3	2.0	1.8	1.7	1.7	1.8
	ICU admittance (CD-grade IV)	0.6	0.7	0.6	0.2	0.2	0.2	0.2
	Mortality (CD-grade V)	0.1	0.0	0.1	0.1	0.0	0.0	0.0

DICA DATO obesitas

maagband

nagenoeg obsoleet

bandcomplicaties
niet duurzaam



maagband

echter…

banded procedures met een (Minimizer®) ring:

- sleeve
- (elongated pouch) RYGB
- OAGB

maagband

banded procedures met een (Minimizer®) ring:

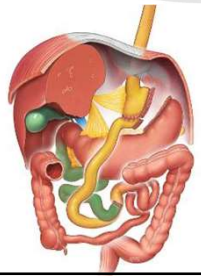
- sleeve
- (elongated pouch) RYGB
- OAGB
- grotendeels nog in onderzoek, geen standaard zorg

echter…

gastric bypass (RYGB)

nog altijd gouden standaard in NL

- pouch size (5-15 cm)
- alimentaire lis (75-150cm)
- biliopancreatische lis (50-150cm)
- common channel
- total alimentary limb length (TALL): AL+CC

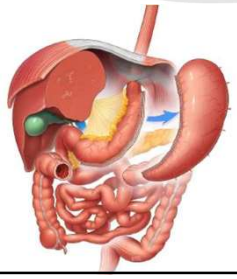


one anastomosis gastric bypass (OAGB)

één anastomose
sleeve-like pouch 10-15cm (40F)
biliopancreatische lis 150-200cm
mogelijk betere resultaten dan RYGB
gallige reflux

Sleeve maagverkleining

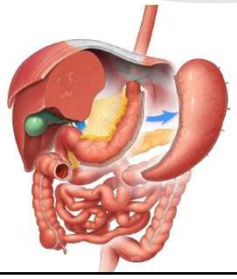
internationaal zeer populair
36-40F
resultaten niet beter dan RYGB
ander bijwerking profiel



Sleeve - indicatie

heel hoge BMI (>55)
IBD/Crohn
jonge vrouwen met onvervulde kinder(en)wens
ontoegankelijk abdomen
(pre)transplantatie

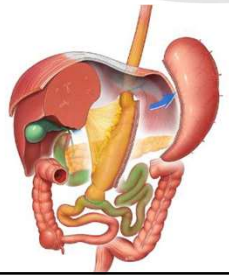
patient voorkeur



single anastomosis duodeno-ileal bypass

SADI

één anastomose variant van duodenal switch
met sleeve
extremer dan OAGB/RYGB
meer morbiditeit



SADI - indicatie

SADI

2^{nd} step procedure na sleeve bij hoge BMI (>55)

grotere metabole impact

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Surgery for Obesity and Related Diseases 18 (2022) 555–564

SURGERY FOR OBESITY AND RELATED DISEASES

Review article

The role of total alimentary limb length in Roux-en-Y gastric bypass: a systematic review

Alice Wang, M.D., M.H.S.[a], Lauren Poliakin, M.D.[a], Naresh Sundaresan, M.D.[a], Vilok Vijayanagar, D.O.[b], Alexander Abdurakhmanov, M.D.[a], Kyle J. Thompson, Ph.D.[b], Iain H. Mckillop, Ph.D.[b], Selwan Barbat, M.D.[a], Roc Bauman, M.D.[a], Keith S. Gersin, M.D.[a], Timothy S. Kuwada, M.D.[a], Abdelrahman Nimeri, M.D., F.A.C.S., F.A.S.M.B.S.[a,*]

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TALL

Studies measuring total alimentary limb length

Authors	Yr	Country	Study type	Procedure	Focus on superobese	Revision	Total pts, n	Study period	Follow-up period, yr	Follow-up yr*, n (%)	Method of bowel measurement
Thurnheer et al. [25]	2012	Switzerland	Retrospective study	Distal RYGB	No	No	355	2002–2010	5	1 (60)	NA
Savassi-Rocha et al. [41]	2008	Brazil	Prospective study	RYGB	Yes	No	100	2004–2005	1	1 (100)	Minimal tension, silk string
Schiavon et al. [28]	2018	Brazil	Substudy of RCT	RYGB	No	No	45	NA	1	1 (100)	Unstretched bowel, 10-cm instrument
Ahmed et al. [42]	2019	United States	Retrospective study	RYGB	No	No	1730	2006–2009	7	5 (86)	Variable techniques
Gadiot et al. [10]	2020	Netherlands	RCT	RYGB	No	No	196	2014–2018		1 (95.5)	Unstretched bowel, 5cm instrument
				RYGB			211				
Nelson et al. [24]	2006	United States	Retrospective study	RYGB	Yes	No	257	1985–2004	2 (range, 1–12)	2 (73)	NA
Navez et al. [43]	2016	Belgium	Prospective study	RYGB	No	No	90	NA	1	1 (100)	Unstretched bowel, silk string
Chen et al. [27]	2019	Taiwan	Retrospective study	OAGB	No	Yes	12	1998–2016	3	1 (74)	NA
				RYGB			7				
Shah et al. [26]	2019	Norway	Retrospective study	RYGB	Yes	No	69	2006–2015	10	5 (74)	Unstretched bowel, instrument
				Distal RYGB			88				
				Distal RYGB			30				
Skrikanth et al. [44]	2010	United States	Retrospective study	Distal RYGB	Yes	Yes	17	1993–2005	13	10 (83.3)	Minimal tension
				Distal RYGB			21				
Van der burgh et al. [20]	2020	Netherlands	Retrospective study	Distal RYGB	No	Yes	44	2014–2018	4	1 (95)	NA
Ghiassi et al. [22]	2018	United States	Retrospective study	Distal RYGB	No	Yes	11	2010–2016	3	1 (70)	NA
							85				
Kalfarentzos et al. [12]	2011	Greece	Retrospective study	Distal RYGB	Yes	No	75	1996–2001	8	2 (96)	Fully stretched bowel
				Distal RYGB			44			2 (82)	
				BPD			841			2 (66)	
Kaska et al. [14]	2014	Poland	Retrospective study	RYGB	No	No	51	2008–2010	2	2 (100)	Fully stretched bowel
				RYGB			42				
Kellum et al. [13]	2011	United States	Retrospective study	Distal RYGB	Yes	No	49	1985–1989	10 ± 6.1	5 (70.4)	NA
				RYGB			92				
Sugerman et al. [16]	1997	United States	Retrospective study	Distal RYGB	Yes	Yes	22	1986–1988	5	1 (92)	NA
				Distal RYGB			5				
Scruggs et al. [15]	1993	United States	Retrospective study	RYGB	No	No	8	1989–1991	1	1 (100)	NA
				Distal RYGB			8				
Shin et al. [21]	2018	United States	Retrospective study	Distal RYGB	No	Yes	22	2012–2017	2	1 (86)	NA
Rawlins et al. [18]	2011	United States	Retrospective study	Distal RYGB	No	yes	29	2002–2009	5	1 (100)	NA
Kraljević et al. [19]	2020	Switzerland	Retrospective study	Distal RYGB	No	Yes	28	2008–2015	6	3 (89)	NA
Fox et al. [17]	1996	United States	Retrospective study	Distal RYGB	No	Yes	80	1992–1994	4	1 (40)	NA

BPD = biliopancreatic diversion; NA = not specified; OAGB = one anastomosis gastric bypass; Pts = patients; RCT = randomized control trial; RYGB = Roux en Y gastric bypass.

* Follow-up years indicates the percentage follow-up at 1 year or the year where there was at least 70% follow-up.

TALL

Effect of total alimentary limb length on weight loss and co-morbidity improvement

Authors	Total pts, n	BMI	TSBL, cm	BPL, cm	RL, cm	CC, cm	TALL, cm	Gastric pouch size, mL	Weight loss: EWL, %	Weight loss: TWL, %	Weight loss: Change BMI	T2D, n (%)	HTN, n (%)	HLD, n (%)
Gadiot et al. [10]	196	42.7 ± 4.5	587 (390–890)	60	422 (210–730)	100	522	—	84.3	34.2	—	22 (68.8)	32 (46.4)	48 (58.8)
	211	42.3 ± 4.4	598 (355–985)	60	150	383 (145–755)	533	—	85.3	33.6	—	25 (53.2)	45 (57.7)	48 (55.8)
Shah et al. [26]	69	54.6 (50–81.1)	620 (420–870)	60	150	410 (estimated)	560	—	62.0*	36.0*	—	—	—	—
	88	58.5 (50.2–73.4)	—	200	270 (estimated)	150	420	—	71.0	40.0	—	—	—	—
	30	57.4 (50–68.3)	—	200	220 (estimated)	200	420	—	69.0	39.0	—	—	—	—
Kalfarentzos et al. [12]	75	56.2 ± 7.3	—	80	—	100	—	15 ± 5	55.8*	—	18.6*	15 (100)	33 (75.0)	29 (80.6%)
	44	51.7 ± 7.4	—	—	250	100	350	15 ± 5	77.3	—	22.5	12 (100)	15 (88.2)	21 (87.5)
	841	57.1 ± 9	—	—	400	100	500	40 ± 10	72.1	—	25.4	178 (97.8)	170 (80.9)	252 (91.6)
Kaska et al. [14]	51	43.3 ± 5.7	470.9 ± 108.23	68.8 ± 8.48	157.9 ± 50.11	237 ± 59.75	394	30–40	—	—	2 ± 5.4	38 (74.5) Hb <6	—	—
	42	45.1 ± 5.5		133.2 ± 17.50	151.4 ± 27.97	193.5 ± 56.72	344	—	—	—	17.3 ± 4.2	40 (95.2) Hb <6*	—	—
Kellum et al. [13]	49	57.9 ± 8.3	—	—	100–200	50–150	250	50	72.4* ± 15.0	—	25.1*	—	—	—
	92	58.6 ± 9.6	—	75	150	—	—	—	55.1 ± 24.7	—	20.3	—	—	—
Scruggs et al. [15]	8	42.7 ± 9	—	60	90	—	—	30	—	46.9	—	—	—	—
	8	51.4 ± 9	—	—	90	180–240	270–310		—	56.9	—	—	—	—

pts = patients; BMI = body mass index; TSBL = total small bowel length; BPL = biliopancreatic limb; RL = Roux limb; CC = common channel; TALL = total alimentary limb length; EWL = excess weight loss; TWL = total weight loss; T2D = type 2 diabetes; HTN = hypertension; HLD = hyperlipidemia.

Co-morbidities are listed as number and present improvement or resolution.

* $P < .05$ when compared against the other cohort.

TALL

Effect of total alimentary limb length and common channel on malnutrition

Authors	Pts, n	BPL, cm	RL, cm	CC, cm	TALL, cm	LL, n (%)	HypoAlb, n (%)	Supp feed, n (%)	Vit B1, n (%)	Vit B12, n (%)	Ca, n (%)	PTH, n (%)	Vit D, n (%)	Iron, n (%)	Mortality,* n (%)
Thurnheer et al. [25]	355	78 ± 14.1	604 ± 99	76.1 ± 7.2	680.1	4 (1.1)	47 (13.3)	—	—	35 (16.6)	1 (0.4)	30 (14.1)	15 (7.2)	—	0 (0)
Schiavon et al. [28]	45	100	150	466.3 ± 86.4	616.3	—	—	—	—	29.60 ± 22.87[†]	—	—	—	18.14 ± 40.16[†]	—
Gadiot et al. [10]	196	60	422 (210–730)	100	522	3 (1.5)	—	0 (0)	—	—	—	—	—	—	0 (0)
	211	60	150	383 (145–755)	533	—	—	0 (0)	—	—	—	—	—	—	0 (0)
Nelson et al. [24]	257	50	300–500	100	400–600	9 (3.5)	—	—	—	—	—	—	—	—	2 (.8)
Chen et al. [27]	12 (OAGB)	222 ± 104.3	251 ± 71.7	294 ± 71.3	609.5 ± 48.1	19 (100)	19 (100)	—	—	—	—	—	—	—	0 (0)
	7							—	—	—	—	—	—	—	0 (0)
Shah et al. [26]	69	60	150	410 (estimated)	560	—	0 (0)	1 (1.4)	—	—	—	—	—	—	0 (0)
	88	200	270 (estimated)	150	420	—	1 (1.1)	8 (9.1)	—	—	—	—	6 (6.8)	2 (2.3)	0 (0)
	30	200	220 (estimated)	200	420	—	2 (6.7)	1 (3.3)	—	—	—	—	—	—	0 (0)
Srikanth et al. [23]	17	—	150	<150	250–300	0	—	1 (5.8)	—	—	—	—	2 (11.8)[‡]	—	0 (0)
	21	—	—	>150	300	0	—	1 (4.7)	—	—	—	—	3 (14.3)[‡]	—	0 (0)
Van der burgh et al. [20]	44	—	300	100	400	8 (18.2)	6 (13.6)	—	0 (0)	11 (26)	26 (60)	—	—	—	1 (2.3)
Ghiassi et al. [22]	11	—	100	150–200	250–300	7 (63.6)	3 (27.3)	3 (27.3)	—	—	—	—	—	—	0 (0)
	85	200–700	100	300–350	400–450	—	4 (14.3)	—	1 (5.6)	1 (5)	2 (7.4)	8 (40)	14 (66.7)	5 (21.7)	0 (0)
Kalfarentzos et al. [12]	75	80	—	100	—	1 (1.3)	2 (2.7)	1 (1.3)	—	14 (19.4)	1 (1.4)	3 (4.2)	—	12 (16.7)	2 (2.7)
	44	—	250	100	350	6 (13.6)	11 (25.0)	5 (11.0)	—	10 (25)	2 (5.5)	3 (8.3)	—	12 (30.6)	0 (0)
	841	—	400	100	500	8 (.95)	26 (3.1)	18 (2.1)	—	175 (23.4)	7 (.9)	36 (4.8)	—	101 (13.5)	4 (.5)
Kellum et al. [13]	49	—	100–200	50–150	250	21 (43.7)	—	7 (14.6)	—	436.0 ± 321[§]	8.0 ± .7[§]	—	11.4 ± 9.6[§]	24.4 ± 15.5[§]	1 (2)
	92	75	150	—	—	—	—	—	—	521.9 ± 440[§]	8.9 ± .5[§]	—	16.6 ± 13.9[§]	53.7 ± 28.8[§]	—
Sugerman et al. [16]	22	—	145	150	295	3 (13.6)	3 (13.6)	4 (18.2)	—	—	5 (23)	—	13 (63)	—	—
	5	—	250	50	300	5 (100)	5 (100)	5 (100)	—	—	—	—	—	—	2 (40)
Shin et al. [21]	22	—	107.4 ± 34.8	155.5 ± 33	255.8	3 (13.6)	5 (29.4)	—	2 (11.8)	4 (22.2)	—	9 (50)	—	1/17 (5.9)	0 (0)
Rawlins et al. [18]s	29	—	150	100	250	1 (3.4)	9 (31.0)	6 (20.7)	—	9 (32)	—	8 (27)	23 (82)	10 (36)	0 (0)
Kraljević et al. [19]	28	50	150	100	250	6 (21.4)	8 (28.6)	—	—	14 (50)	4 (14)	—	17 (60)	—	0 (0)
Fox et al. [17]	80	—	150	100	250	—	21 (26.3)	3 (3.8)	—	5 (6)	11 (14)	—	20 (25)	26 (33)	1 (1.3)

TALL

ELSEVIER

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SURGERY FOR OBESITY AND RELATED DISEASES

Review article

The role of total alimentary limb length in Roux-en-Y gastric bypass: a systematic review

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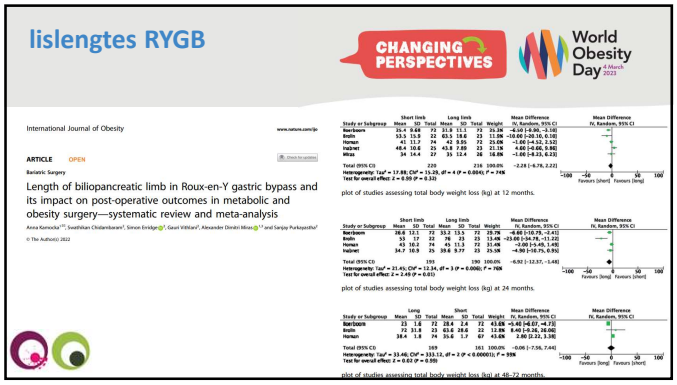
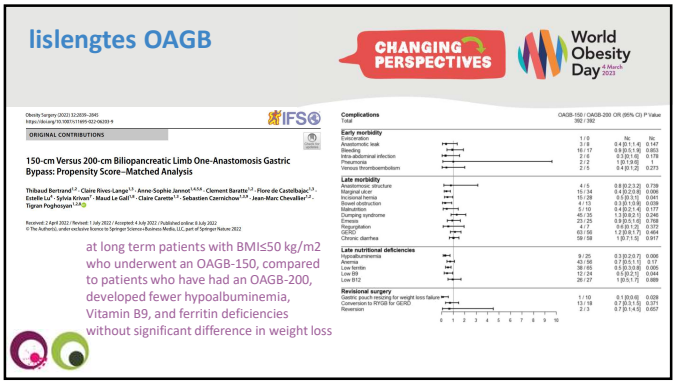
- the majority of studies on RYGB do not report TALL length
- weight loss is affected by shortening TALL
- TALL <400cm with CC <200cm should be avoided due to severe protein malnutrition

lislengtes RYGB



lislengtes OAGB



at long term patients with BMI≤50 kg/m2 who underwent an OAGB-150, compared to patients who have had an OAGB-200, developed fewer hypoalbuminemia, Vitamin B9, and ferritin deficiencies without significant difference in weight loss

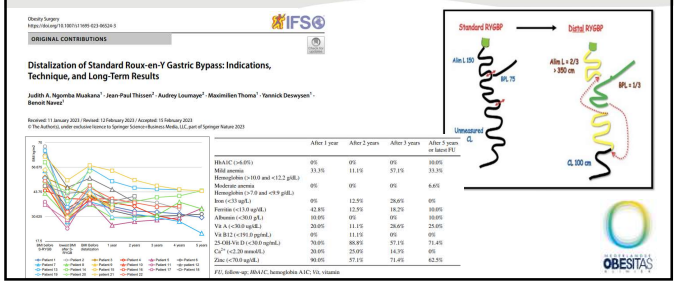
revisie chirurgie

- Aanpassen van de bestaande techniek
- Conversie naar een andere techniek

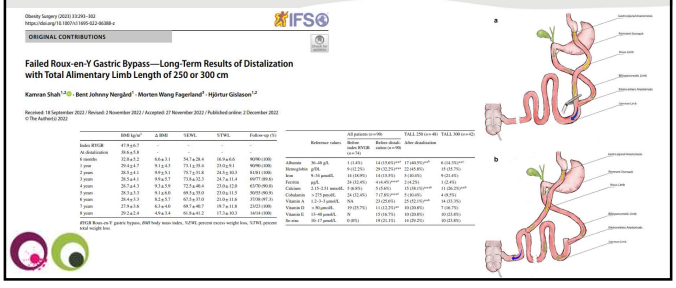
revisie chirurgie

- re-sleeve (bougie size, fundus, antrum)
- pouch resizing (evt. met ring)
- proximaliseren
- distaliseren

distaliseren

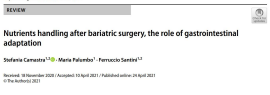


distaliseren



gastro-intestinale veranderingen na chirurgie

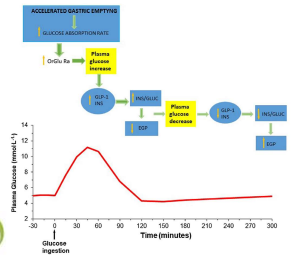
- maagontlediging
- darm adaptatie
- hormonale veranderingen
- vertering en opname van voedingsstoffen
- intestinaal microbioom
- verbeterde glucosesensitiviteit



Nutrients handling after bariatric surgery, the role of gastrointestinal adaptation

SG		RYGB
↑	GASTRIC EMPTYING	↑↑
↓↑	INTESTINAL TRANSIT TIME	↑
↔	INTESTINAL EPITELIUM ADAPTATION	IPERTROPHYC
↔	INTESTINAL GLUCOSE TRANSPORTER	↑
↓↔↑	GLUCOSE ABSORPTION RATE	↑
↔	PROTEIN ABSORPTION RATE	↑
↑	GLP-1 SECR.	↑↑
↑	GIP SECR.	↑↑
↑	GLP-1 CELL	↑
↔	GIP CELL	↑
n.i	BILE ACIDS PLASMA LEVELS	↑
↔	GLUCOSE MALABSORPTION	↔
↔	PROTEIN MALABSORPTION	↔
↔	LIPID MALABSORPTION	↑

postprandiaal glucose profiel na RYGB



eiwitten

- opname voornamelijk in het proximale jejunum
- maar gehele dunne darm kan deze functie uitvoeren
- RYGB lijkt geen eiwit malabsorptie te veroorzaken
- ook na een distale RYGB niet-significant verminderd
- Versnelde eiwitvertering en aminozuuropname kan invloed hebben op de metabole en hormonale veranderingen die optreden na RYGB
- Aminozuren vormen een belangrijke stimulans voor glucagon

lipiden - hypothesen

- Na RYGB gaan lipiden niet door het duodenum en dientengevolge is de afscheiding van gal en pancreasenzymen verlaagd
- De vertraagde transformatie van voedingsvetten en de vertraagde vorming van micellen zou de beschikbare hoeveelheid vet voor absorptie kunnen beperken
- versnelde doorvoer van lipiden naar terminale ileum met als gevolg een verbeterde vetopname en een verhoogde metabole klaring van plasmatriglyceriden

gastro-intestinale veranderingen na chirurgie

- versnelde maagontlediging cruciaal startpunt
- versneld verschijning van glucose in de bloedsomloop
- stimulatie van entero-hormonen
- stimulatie van insuline afscheiding
- versnelde eiwitvertering en opname van aminozuren na RYGB (niet na SG)
- intestinale veranderingen na RYGB leiden hooguit tot lichte malabsorptie van lipiden maar niet van koolhydraten en eiwitten
- functionele en morfologische aanpassingen van de darm na RYGB en SG activeert cross-talk tussen organen die de stofwisseling moduleert
- veranderde en insulinesecretie en insulinegevoeligheid

Nutrients handling after bariatric surgery, the role of gastrointestinal adaptation

conversie chirurgie

- band naar RYGB/Sleeve
- sleeve naar OAGB/RYGB
- sleeve naar SADI
- VBG naar RYGB
- SADI naar RYGB

complicaties

CHANGING PERSPECTIVES — World Obesity Day 4 March 2023

IFSO European Chapter

EMERGENCY CARE FOR THE BARIATRIC PATIENT

Emergency Room Poster of IFSO-EC, Adapted from the Dutch Society for Metabolic and Bariatric Surgery

The acute bariatric patient

The patient

1. Presents itself with fewer complaints, seems to have little pain, but is still very ill
2. Has fewer physiological reserves, leading to faster and deeper shock
3. Vomiting is in principle not a side effect of a bariatric procedure

Alarm symptoms

Tachycardia >120/min | ≥ 38.5°C, hypoxia, hypotension | Vomiting blood or melaena | Vomiting and/or stomach ache

Most common bariatric procedures and its side effects

Gastric Bypass (RYGB)
- Dumping
- Poor diet/impaired absorption
- Abdominal discomfort

Banded Procedures (AGB; VBG; Banded Sleeve or Banded Bypass)
- Gastroesophageal reflux
- Nausea and vomiting
- Food intolerance

Sleeve Gastrectomy (Sleeve)
- Gastroesophageal reflux
- Poor diet
- Dyspepsia

Single Anastomosis Duodenal-Ileal Bypass + Sleeve (SADI-S)
- Gastroesophageal reflux
- Poor diet/impaired absorption (proteins!)
- Diarrhea/steatorrhea

One Anastomosis Gastric Bypass (OAGB)
- Biliary reflux
- Poor diet/impaired absorption
- Diarrhea

Biliopancreatic Diversion/ Duodenal Switch (BPD/DS)
- Gastroesophageal reflux
- Dumping
- Steatorrhea/diarrhea

Endoscopic Procedures
- Nausea and vomiting
- Food retention
- Reflux

Images created and kindly granted by Dr. Arnold van de Laar (Spaarne Hospital, Hoofddorp, Netherlands)

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Early postoperative complications (30 days) – always consult with (bariatric) surgeon

Bleeding

Symptoms
- Bruising on the abdominal wall
- Vomiting blood/melaena
- Collaps
- Tachycardia
- Low blood pressure

Management
- Resuscitate, transfusion (RBC) and correct coagulation
- **Pay attention!** Intra-abdominal bleeding is possibly an indication for leakage
- Unstable despite volume resuscitation: consider gastroscopy/laparoscopy
- CT-abdomen for stable patients only
- **Pay attention!** After Gastric Bypass, the remnant stomach is not accessible for gastroscopy

Leakage/Perforation

Symptoms
- 'Change' in postoperative course
- Tachycardia
- Fever
- Pain

Management
- Resuscitate
- Laparoscopy
- Consider CT abdomen
- Consider percutaneous drainage
- Broad spectrum IV antibiotics

Pulmonary Embolism

Symptoms
- Chestpain
- Tachypnea

Management
- CT-anglo chest/lung
- Anticoagulation

Obstruction

Management
- Obstruction can lead to leakage and/or strangulation
- No nasogastric tube. No conservative policy without a definitive diagnosis!
- Gastric Band → Puncture Access Port and empty Gastric Band
- Sleeve → nil per os + swallow study/CT with oral contrast
- Gastric Bypass → CT abdomen (oral and intravenous contrast) excluding stenosis of anastomoses or internal herniation Negative CT with strong clinical suspicion: laparoscopy
- **Pay attention!** Enlarged remnant stomach + elevated liver/ pancreas values = obstruction at jejuno-jejunostomy!

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Late postoperative complications

Abdominal Pain

Diagnosis & Management

Upper abdomen:
- Exclude gallstones: ultrasound
- Exclude ulcer: gastroscopy
- Exclude perforation: CT abdomen

Mid/lower abdomen:
- CT abdomen to exclude stenosis of anastomosis, or internal herniation
- IBS can develop or worsen after weight loss
- Overeating can cause abdominal pain

Obstruction

Management
- No nasogastric tube. No conservative policy without definitive diagnosis!
- Gastric Bypass → bowel strangulation (internal herniation), CT abdomen: swirl sign/laparoscopy <5h!!
- Gastric Band → empty Gastric Band + swallow study
- Sleeve → nil per os + swallow study
- Negative CT with strong clinical suspicion: laparoscopy

Hypoglycaemia
- Dumping (after too many calories/carbohydrates): dizzy, "hot flush", sleepy, abdominal discomfort, tachycardia
- Tachycardia

Management
- Correct hypoglycaemia
- Dumping: dietary adjustments (consultation with bariatric dietician), medication (consultation with bariatric endocrinologist)

Malnutrition and Deficiencies
- Deficiencies can occur after each bariatric procedure: vitamin B1 (vomiting!), B12, D, Hb, Ca, Fe, Protein
- Gastric Bypass/Diversions: also vitamins A, E and K, severe protein malnutrition. Beware of "Refeeding Syndrome"!

Ulcer

Management
- Stop smoking
- Double dose PPI (+ Sucralfate)
- Severe heartburn that does not respond to PPI can mean biliary reflux: exclude internal herniation!

Caveat: H. Pylori

Perforation
- Anastomosis
- Remnant stomach

Management
- Broad spectrum IV antibiotics
- Gold standard: laparoscopy

Gallstones
- Weight loss can cause gallstones and/or kidney stones

Management
- **Pay attention!** After Gastric Bypass, SADI-S and BPD/DS, the duodenum is not accessible for ERCP; consider MRCP
- CBD stones: consider PTC (possibly with duct clearance and papillotomy) or hybrid ERCP

Vragen?

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