



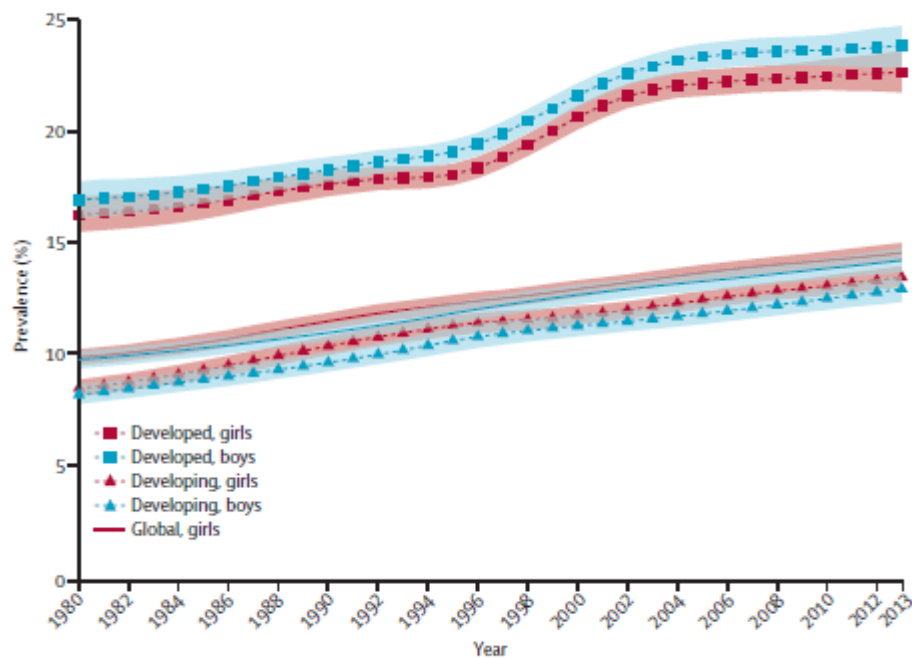
Obesitat.

1. Prevalença
2. Morbilitat de l'obesitat.
3. Etiologia: Microbiota
4. Tractament:
 - Dieta
 - Fàrmacs
 - Cirurgia

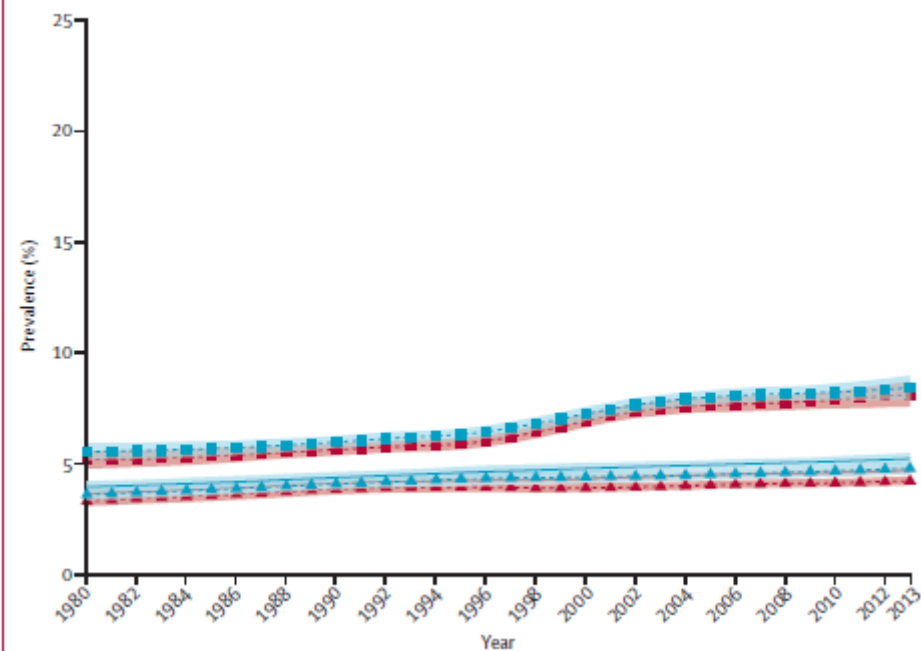
Dra M^a Asunción Recasens Gracia
Unitat Diabetis, Endocrinologia i Nutrició
Servei Medicina Interna
Hospital General Granollers.

Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013

A Overweight and obesity (based on IOTF cutoffs)



B Obesity (based on IOTF cutoffs)



Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013

Worldwide obesity gains 30 %

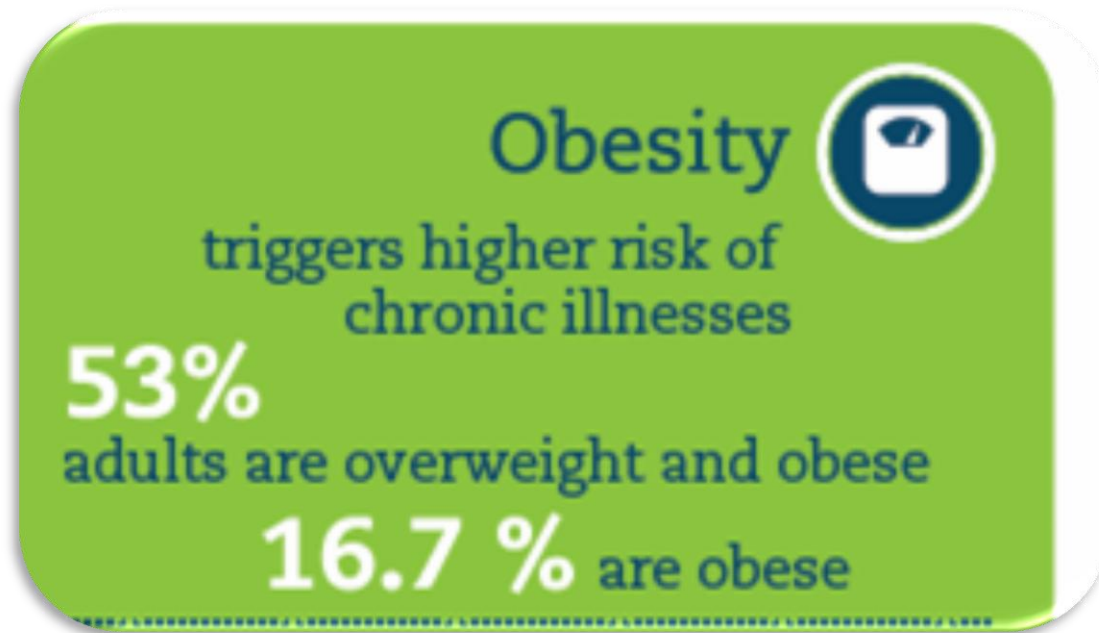


DAVE GRANLUND © www.davegranlund.com

Obesity rates climbing worldwide, most comprehensive global study to date shows. Lancet 2014

1. Prevalença

HEALTH AT A GLANCE: EUROPE 2014



1. Prevalença

In the WHO European Region



- **80% nens (10-15 anys) amb excés de pes seran obesos als 25 anys**
- **Excés de pes abans dels 8 anys s'associa a obesitat més severa en edat adulta**
- **Nens que neixen ara a EEUU, la seva esperança de vida s'escurçarà en 5 anys**

2- Morbilitat de l'obesitat

Body-mass index and risk of 22 specific cancers: a population-based cohort study of 5.24 million UK adults

5.24 milions de persones

166.955 varen desenvolupar càncer

IMC

22 tipus de càncer

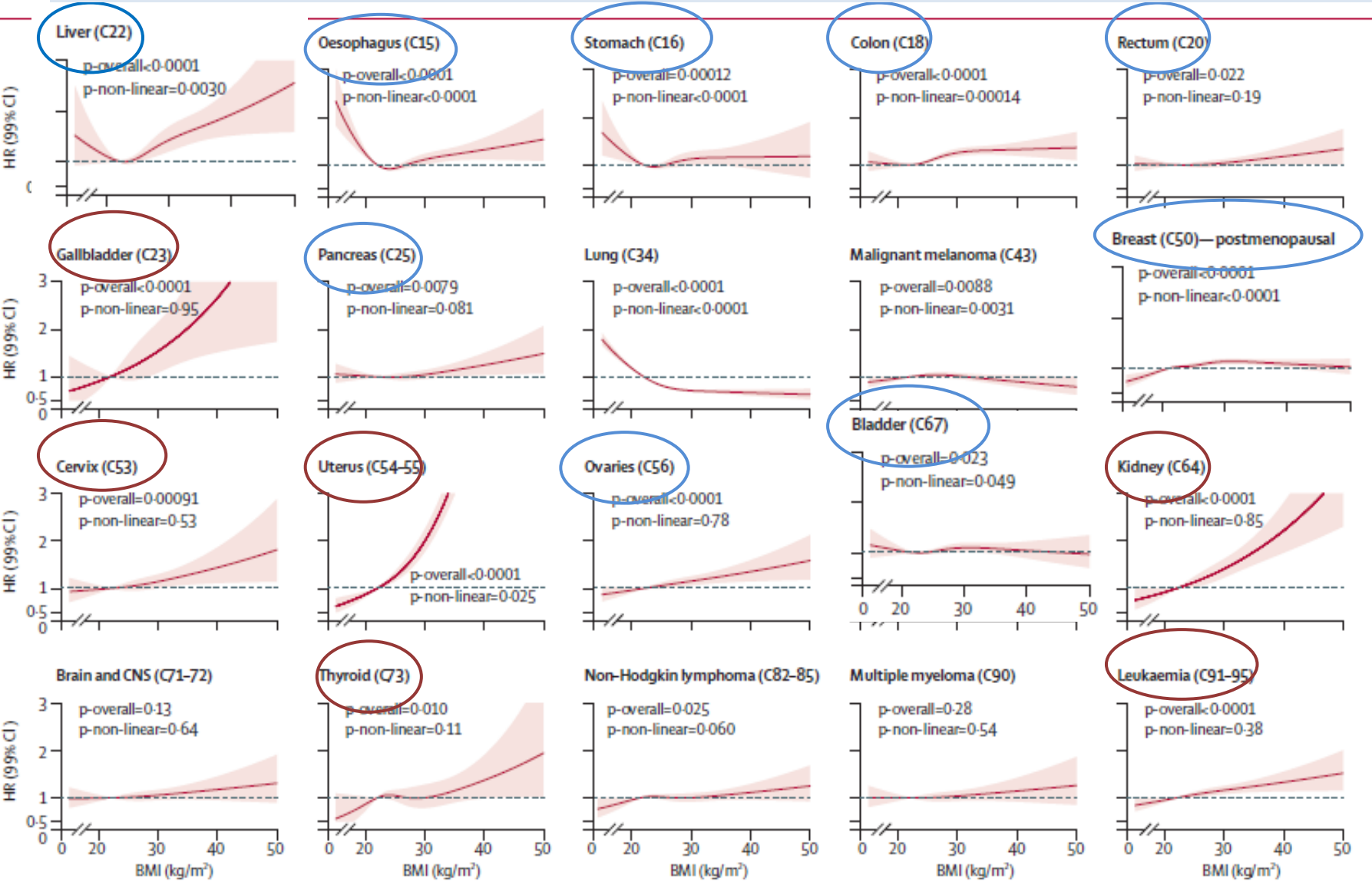
2- Morbilitat de l'obesitat

Body-mass index and risk of 22 specific cancers: a population-based cohort study of 5.24 million UK adults

Dades clíniques d'atenció primària relacionen amb IMC.

Model de Cox per investigar l'associació entre l'IMC i el 22 dels càncers més comuns, amb ajust de potencial factors de confusió (sexe, menopausa, tabaquisme, alcohol i l'edat).

Body-mass index and risk of 22 specific cancers: a population-based cohort study of 5.24 million UK adults



3. Etiopatogenia: microbiota

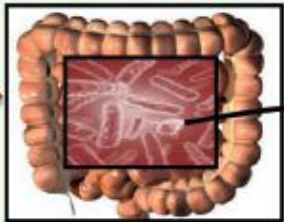


1.500 especies bacterienes

4 Millions gens bacterians

1.000.000.000.000. microorganismes/g de contingut
(pes en fresc)

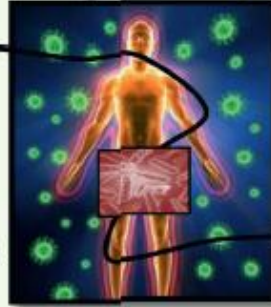
**Changement de régime
Alimentation trop grasse
Stress**



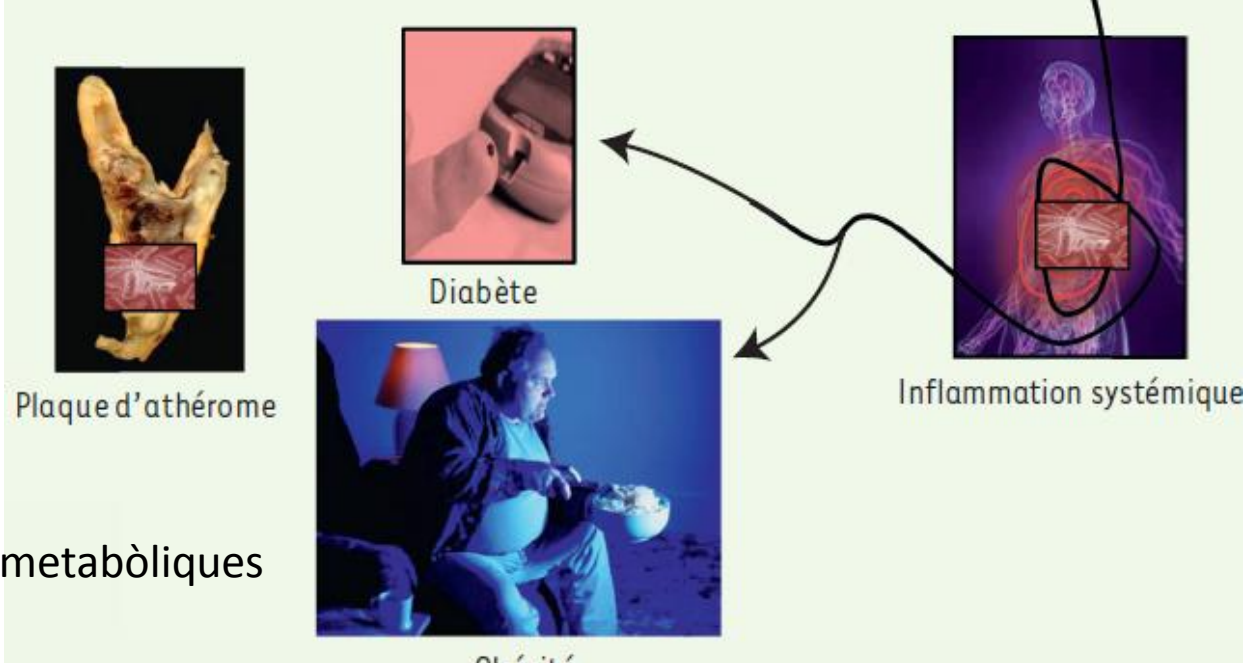
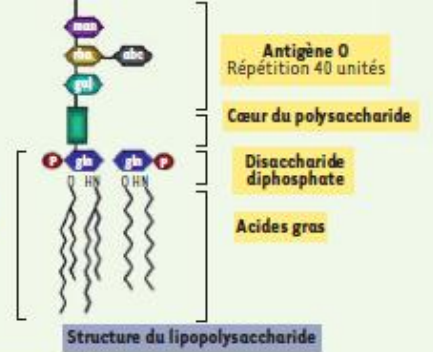
Dysbiose intestinale
Récupération énergétique accrue



Translocation bactérienne



Altération du système immunitaire



Disbiosi intestinal a malalties metabòliques

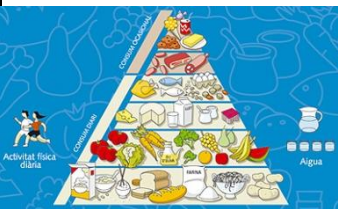
4- Tractament: Dieta



Tipus de dietes hipocalòriques



Dietes de molt baixes en calories

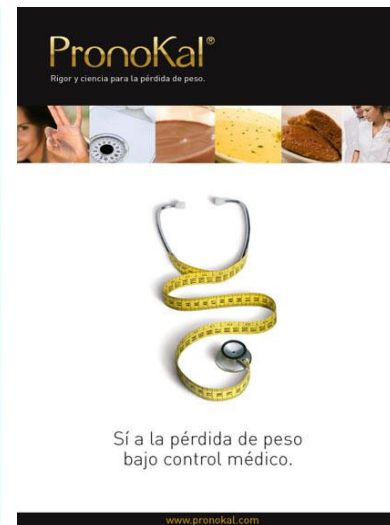
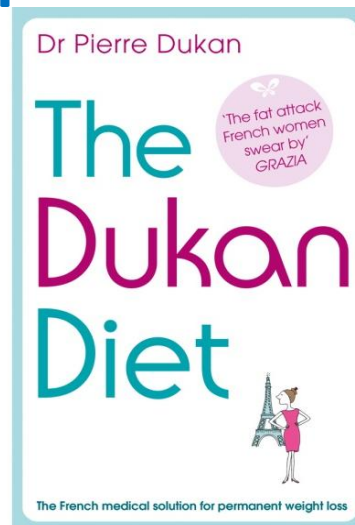
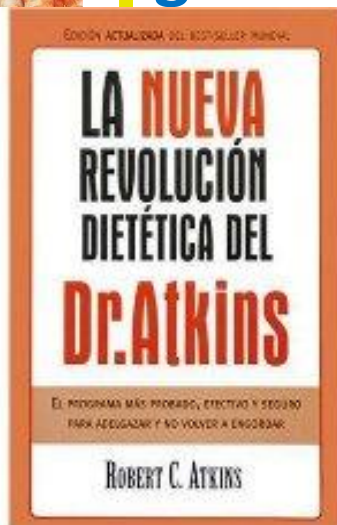


Equilibrades

Reduir entre 500- 1000 Kcal/dia
1 g proteïna/ kg dia



Pobres en hidrats de carboni i riques en greixos i proteïnes



Long term weight maintenance after advice to consume low carbohydrate, higher protein diets. A systematic review and meta analysis

Estudi de més de 12 mesos

32 estudis amb 3.492 persones

Variables

massa grassa ,massa magra, glucèmia,insulinèmia, lipids

Pes

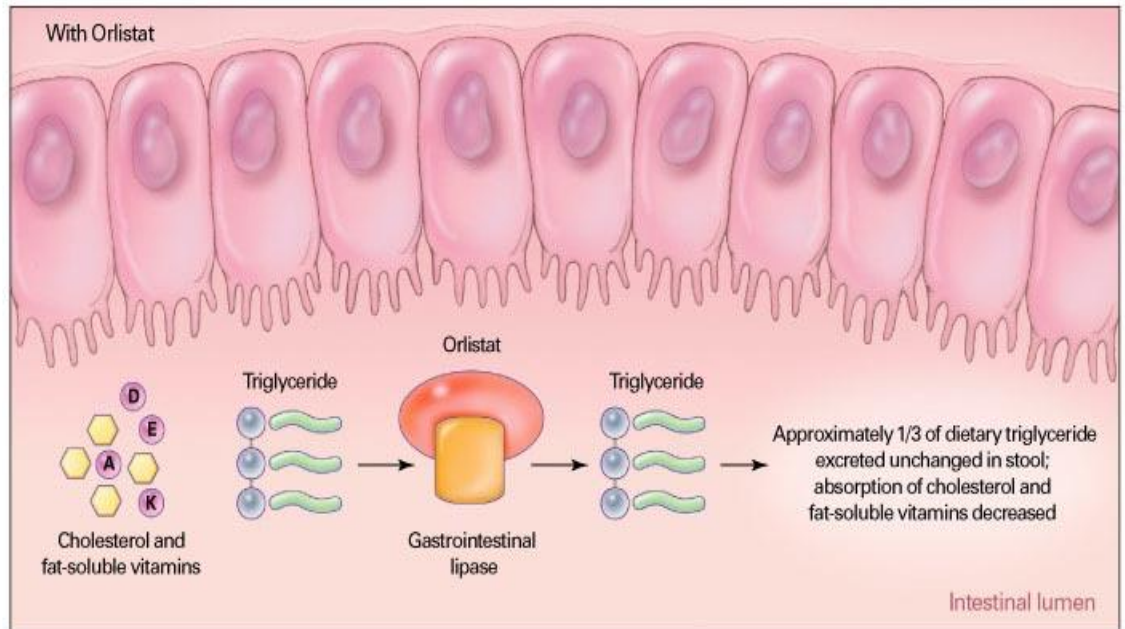
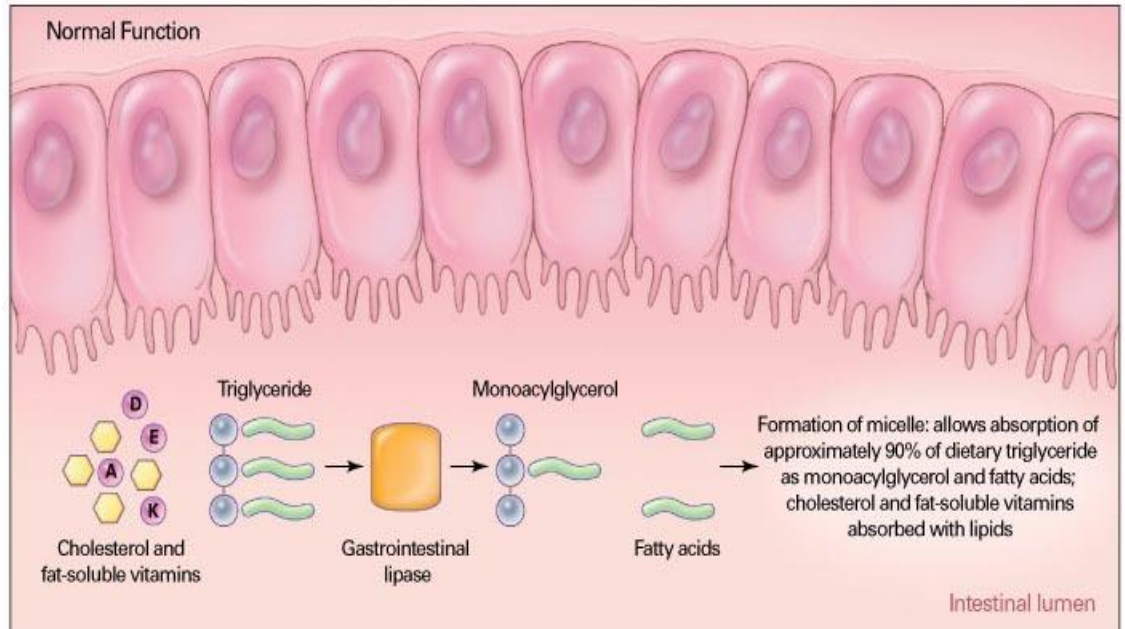
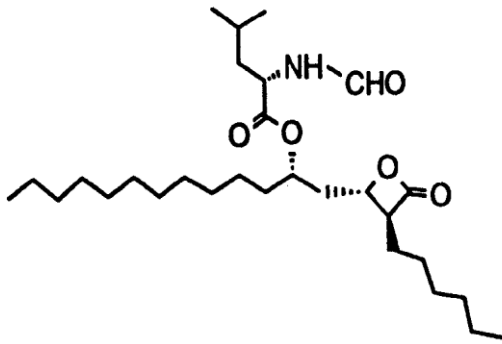
diferència de mitjanes estandarditzada

- 0,138 (95% CI -0,231,- 0,046) p=0,003. \approx 0,4 kg.

4- Tractament: farmacològic



ORLISTAT



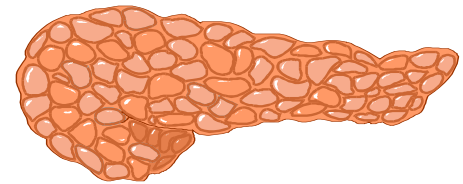
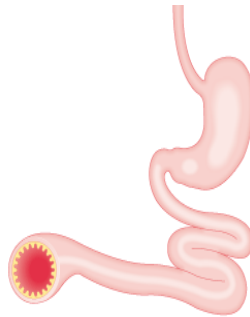
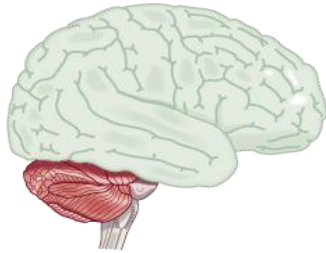
120 mg en cada comida

Incretin mimètics

Exanetide agosniste GLP1

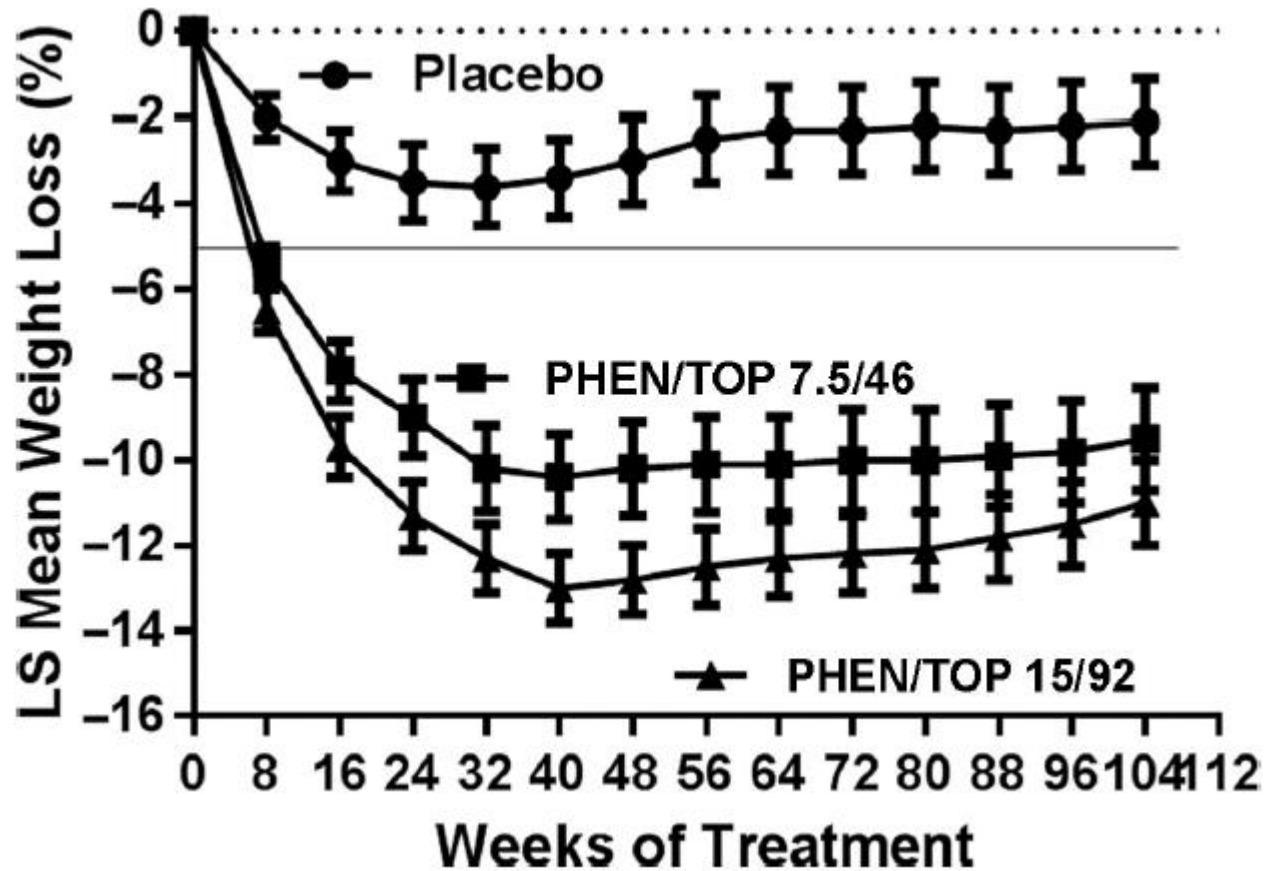
Liraglutide anàleg GLP1

Lixenatide anàleg GLP1



A EEUU

2012 Phentermine–topiramate

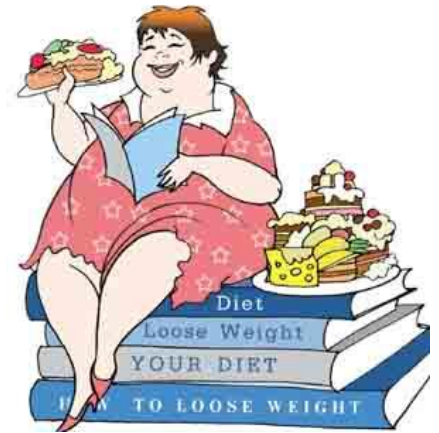


Agonista de la serotonina

Lorcaserina

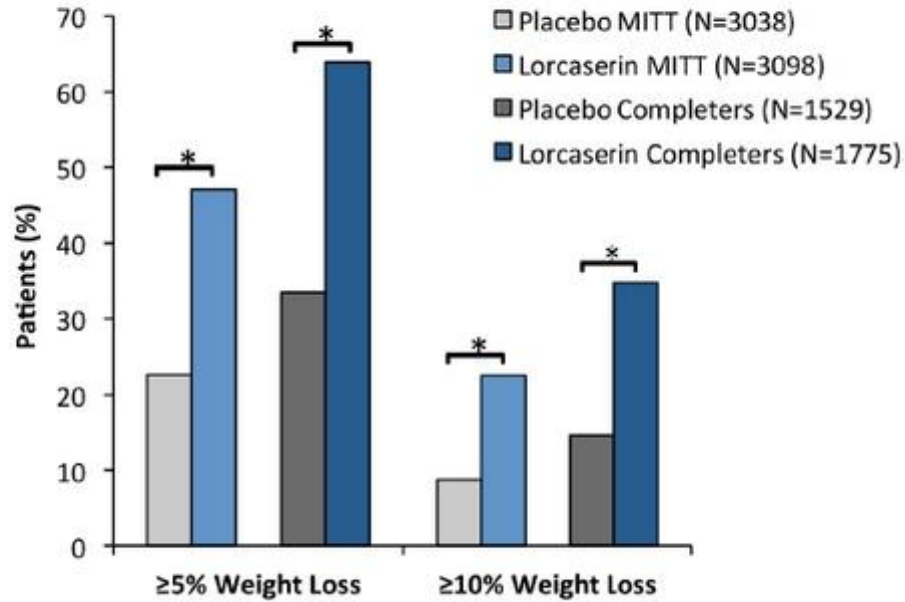
Actua per via central reduint la gana.

EEUU des de 2012



Safety and efficacy of lorcaserin: a combined analysis of the BLOOM and BLOSSOM trials.

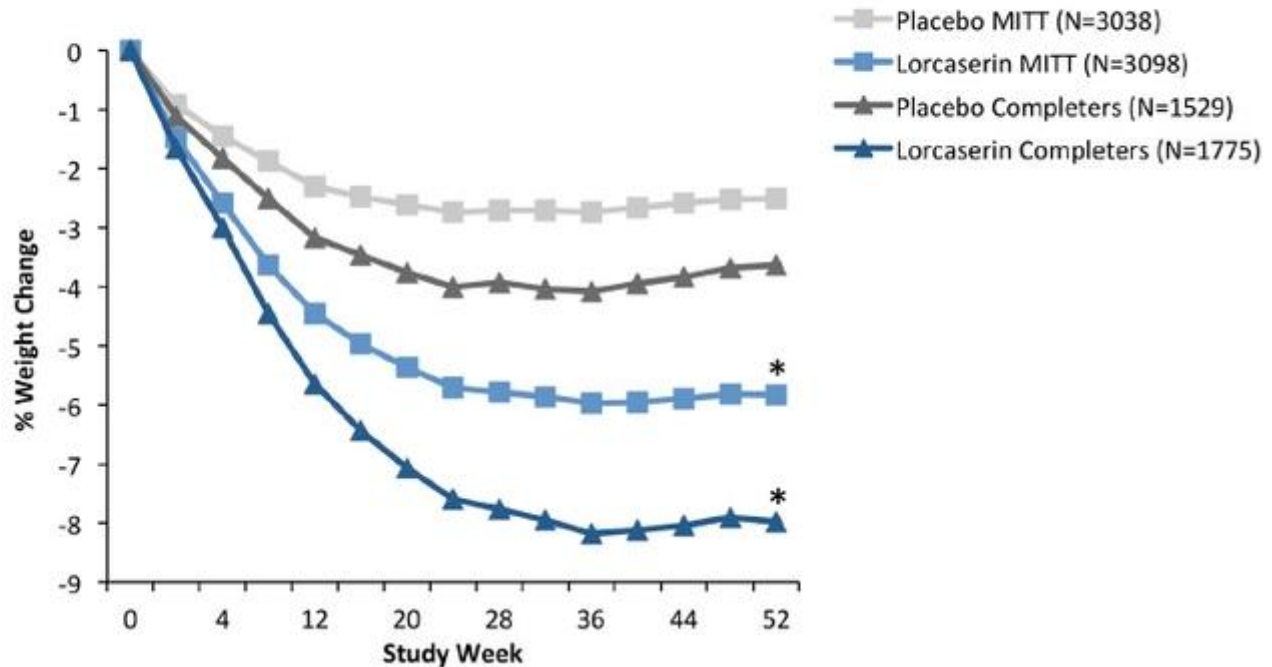
A



[Postgrad Med. 2014;126\(6\):7-18.](#)

Safety and efficacy of lorcaserin: a combined analysis of the BLOOM and BLOSSOM trials.

B



[Postgrad Med. 2014;126\(6\):7-18.](#)

| Preferred Term, n (%) | Placebo (N = 3185) | Lorcaserin, 10 mg BID N = 3195 |
|-----------------------------------|-----------------------|-----------------------------------|
| Headache | 321 (10.1) | 537 (16.8) |
| Upper respiratory tract infection | 391 (12.3) | 439 (13.7) |
| Nasopharyngitis | 381 (12.0) | 414 (13.0) |
| Dizziness | 122 (3.8) | 270 (8.5) |
| Nausea | 170 (5.3) | 264 (8.3) |
| Sinusitis | 245 (7.7) | 236 (7.4) |
| Fatigue | 114 (3.6) | 229 (7.2) |
| Urinary tract infection | 171 (5.4) | 207 (6.5) |
| Diarrhea | 179 (5.6) | 207 (6.5) |
| Back pain | 178 (5.6) | 201 (6.3) |
| Constipation | 125 (3.9) | 186 (5.8) |
| Dry mouth | 74 (2.3) | 169 (5.3) |
| Arthralgia | 150 (4.7) | 149 (4.7) |
| Influenza | 134 (4.2) | 138 (4.3) |
| Cough | 109 (3.4) | 136 (4.3) |
| Gastroenteritis viral | 101 (3.2) | 137 (4.3) |
| Vomiting | 83 (2.6) | 122 (3.8) |
| Oropharyngeal pain | 80 (2.5) | 111 (3.5) |
| Bronchitis | 105 (3.3) | 104 (3.3) |
| Pain in extremity | 95 (3.0) | 99 (3.1) |
| Muscle strain | 74 (2.3) | 98 (3.1) |
| Insomnia | 97 (3.0) | 81 (2.5) |

Drug development strategies for the treatment of obesity: how to ensure efficacy, safety, and sustainable weight loss

2014 FDA

Contrave (combination naltrexona i bupropion d'alliberació retardada)

Liraglutide 3 mg

4- Tractament: quirúrgic



- Risc i efectivitat a llarg termini
- Mortalitat a llarg termini
- Dèficits nutricionals
- Noves tècniques de cirurgia bariàtrica

The Effectiveness and Risks of Bariatric Surgery An Updated Systematic Review and Meta-analysis, 2003-2012

Objectiu:

Examinar la efectivitat i risc de la cirurgia bariàtrica

164 estudis (37 randomizats clinical trials i 127 observationals)

61 756 pacients

44.56 anys

IMC 45.62 Kg/m²

The Effectiveness and Risks of Bariatric Surgery

An Updated Systematic Review and Meta-analysis, 2003-2012

| | Mean (95% CI) | | | | |
|---------------------------|------------------|------------------|--------------------|--------------|------------------|
| | GB | AGB | SG | Control | Overall |
| Mortality ≤30 d | | | | | |
| RCT | | | | | |
| Estimates, % | 0.08 (0.01-0.30) | 0.11 (0.01-0.50) | 0.50 (0.01-3.88) | ^b | 0.08 (0.01-0.24) |
| Study/arm/No. of patients | 11/18/934 | 5/8/743 | 1/2/40 | 0/0/0 | 15/30/1803 |
| OBS | | | | | |
| Estimates, % | 0.38 (0.22-0.59) | 0.07 (0.02-0.12) | 0.29 (0.11-0.63) | ^b | 0.22 (0.14-0.31) |
| Study/arm/No. of patients | 19/30/90 090 | 26/29/40 538 | 10/11/3647 | 1/1/9 | 48/79/136 903 |
| Mortality >30 d | | | | | |
| RCT | | | | | |
| Estimates, % | 0.39 (0.01-0.86) | 0.14 (0.00-0.55) | 6.00 (0.00-100.00) | ^b | 0.31 (0.01-0.75) |
| Study/arm/No. of patients | 11/19/954 | 5/7/613 | 2/2/40 | 0/0/0 | 15/30/1703 |
| OBS | | | | | |
| Estimates, % | 0.72 (0.28-1.30) | 0.21 (0.08-0.37) | 0.34 (0.14-0.60) | ^b | 0.35 (0.20-0.52) |
| Study/arm/No. of patients | 13/18/29 256 | 18/22/33 950 | 8/9/3099 | 0/0/0 | 32/51/66 897 |

AGB, adjustable gastric banding
GB, gastric bypass
SG, sleeve gastrectomy.

JAMA Surg 2014 ; 149: :275-287

The Effectiveness and Risks of Bariatric Surgery

An Updated Systematic Review and Meta-analysis, 2003-2012

| | Mean (95% CI) | | | | |
|---------------------------|---------------------|--------------------|--------------------|--------------|---------------------|
| | GB | AGB | SG | Control | Overall |
| Complication rates | | | | | |
| RCT | | | | | |
| Estimates, % | 21.00 (12.00-33.00) | 13.00 (5.20-26.00) | 13.00 (0.70-44.00) | ^b | 17.00 (11.00-23.00) |
| Study/arm/No. of patients | 10/14/649 | 7/11/855 | 2/2/137 | 2/2/59 | 16/30/1778 |
| OBS | | | | | |
| Estimates, % | 12.00 (7.30-17.00) | 7.80 (3.90-13.00) | 8.90 (5.60-13.00) | ^b | 9.80 (7.40-13.00) |
| Study/arm/No. of patients | 19/28/71 020 | 22/24/36 778 | 8/20/4987 | 0/0/0 | 48/74/113 002 |
| Reoperation rates | | | | | |
| RCT | | | | | |
| Estimates, % | 2.56 (0.61-5.36) | 12.23 (4.46-24.46) | 9.05 (0.77-34.56) | ^b | 6.95 (3.27-12.04) |
| Study/arm/No. of patients | 6/8/512 | 8/10/502 | 2/2/161 | 0/0/0 | 12/23/1322 |
| OBS | | | | | |
| Estimates, % | 5.34 (4.48-6.48) | 7.01 (3.99-11.24) | 2.96 (1.70-4.71) | ^b | 5.75 (4.05-7.83) |
| Study/arm/No. of patients | 6/8/23 688 | 18/21/30 314 | 7/7/2912 | 0/0/0 | 25/39/57 171 |

The Effectiveness and Risks of Bariatric Surgery

An Updated Systematic Review and Meta-analysis, 2003-2012

| | Mean (95% CI) | | | | |
|-------------------------------------|---------------------|---------------------|---------------------|--------------------|---------------------|
| | GB | AGB | SG | Control | Overall |
| Diabetes remission rates | | | | | |
| RCT | | | | | |
| Estimates, % | 95.15 (88.38-98.80) | 73.88 (36.06-96.18) | ^b | 17.64 (0.98-69.27) | 91.99 (84.68-97.18) |
| Study/arm/No. of patients | 6/10/152 | 2/2/35 | 0/0/0 | 1/1/30 | 8/14/206 |
| OBS | | | | | |
| Estimates, % | 92.83 (85.29-97.21) | 67.58 (49.51-82.83) | 85.53 (72.69-94.07) | ^b | 86.05 (78.74-91.62) |
| Study/arm/No. of patients | 16/22/5924 | 18/19/2509 | 14/15/597 | 0/0/0 | 43/57/9037 |
| Hypertension remission rates | | | | | |
| RCT | | | | | |
| Estimates, % | 80.98 (68.21-91.52) | 53.55 (12.52-89.63) | ^b | 49.00 (0.00-99.00) | 75.18 (61.52-86.35) |
| Study/arm/No. of patients | 6/11/183 | 2/2/27 | 0/0/0 | 1/1/27 | 8/15/243 |
| OBS | | | | | |
| Estimates, % | 78.13 (63.67-88.76) | 63.73 (51.74-75.43) | 82.23 (68.19-92.01) | 15.00 (1.40-53.00) | 74.36 (66.53-81.19) |
| Study/arm/No. of patients | 11/15/9586 | 18/19/6214 | 11/12/1152 | 2/2/82 | 37/47/16 962 |
| Dyslipidemia remission rates | | | | | |
| RCT | | | | | |
| Estimates, % | 80.16 (61.68-94.19) | 39.95 (4.69-87.05) | ^b | ^b | 75.77 (55.63-91.49) |
| Study/arm/No. of patients | 5/8/147 | 1/1/132 | 0/0/0 | 0/0/0 | 5/9/279 |
| OBS | | | | | |
| Estimates, % | 63.22 (40.86-82.34) | 60.91 (49.45-72.36) | 82.86 (62.67-94.55) | 5.42 (0.12-30.41) | 67.93 (58.08-77.01) |
| Study/arm/No. of patients | 5/7/556 | 11/11/351 | 5/5/570 | 1/1/63 | 20/23/1477 |



I la morbi-mortalitat cardiovascular?

Bariatric surgery and its impact on cardiovascular disease and mortality: A systematic review and meta-analysis

Objectiu

Avaluar un dels següents resultats: IAM/ Angor/AVC/ mortalitat

14 estudis

29.208 pacients sotmesos a cirurgia bariàtrica i 166.200
controls.

Edat 48 anys, 30% homes i seguits durant 2 - 14.7 anys.

Bariatric surgery and its impact on cardiovascular disease and mortality: A systematic review and meta-analysis

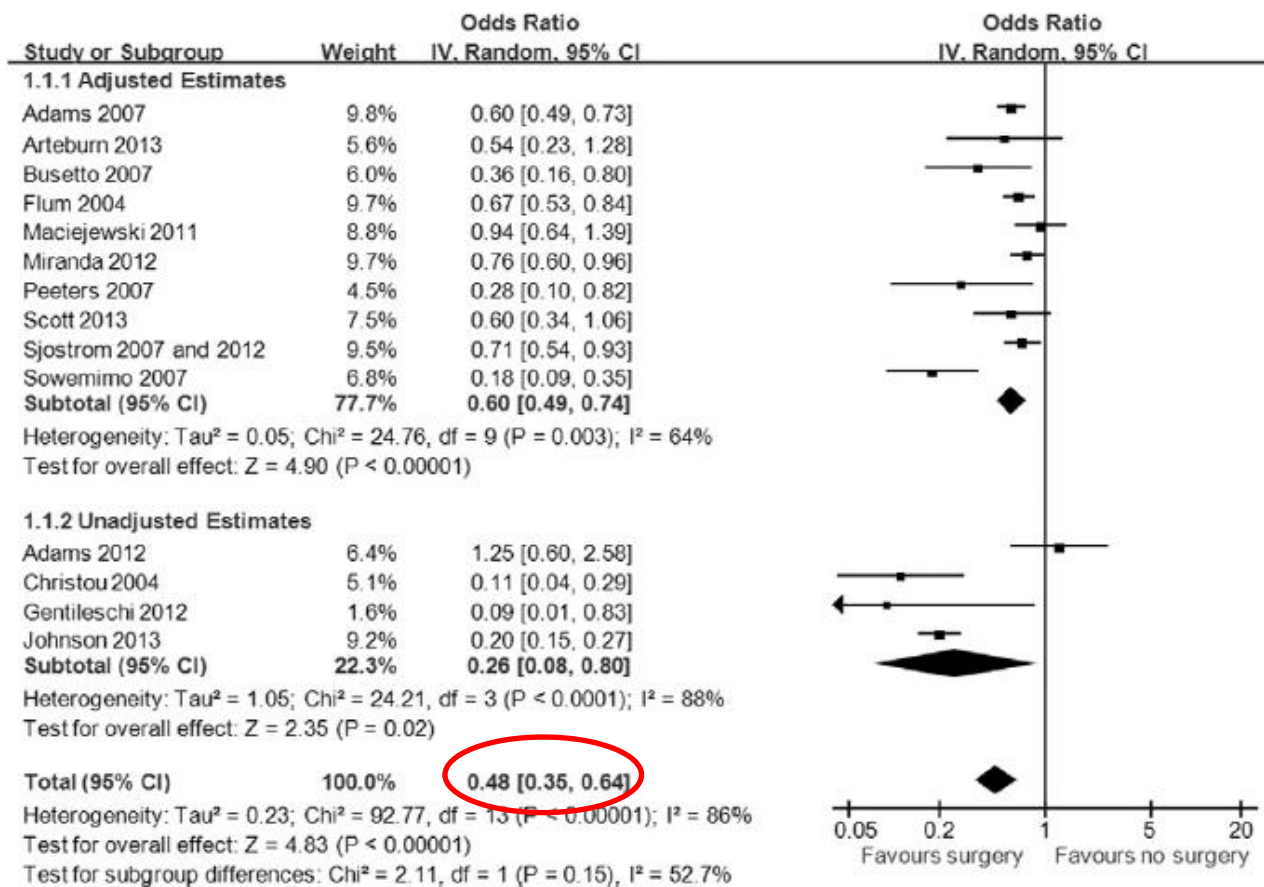


Fig. 2. Meta-analyses of mortality risk after bariatric surgery as compared to no surgery.

Bariatric surgery and its impact on cardiovascular disease and mortality: A systematic review and meta-analysis

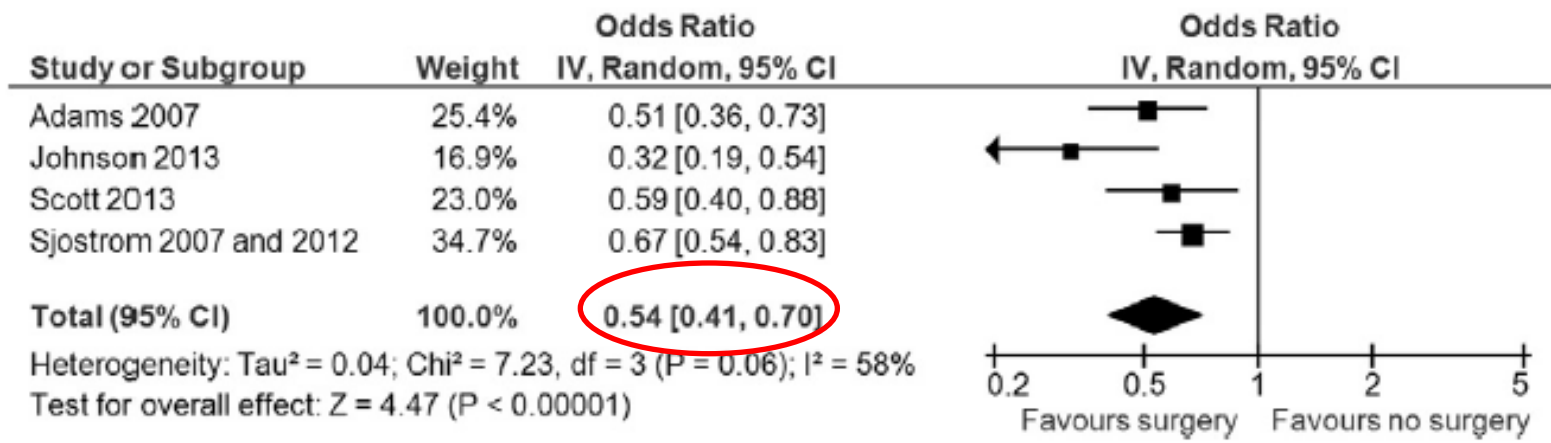


Fig. 3. Meta-analysis of risk of myocardial infarction after bariatric surgery compared to no surgery.

Bariatric surgery and its impact on cardiovascular disease and mortality: A systematic review and meta-analysis

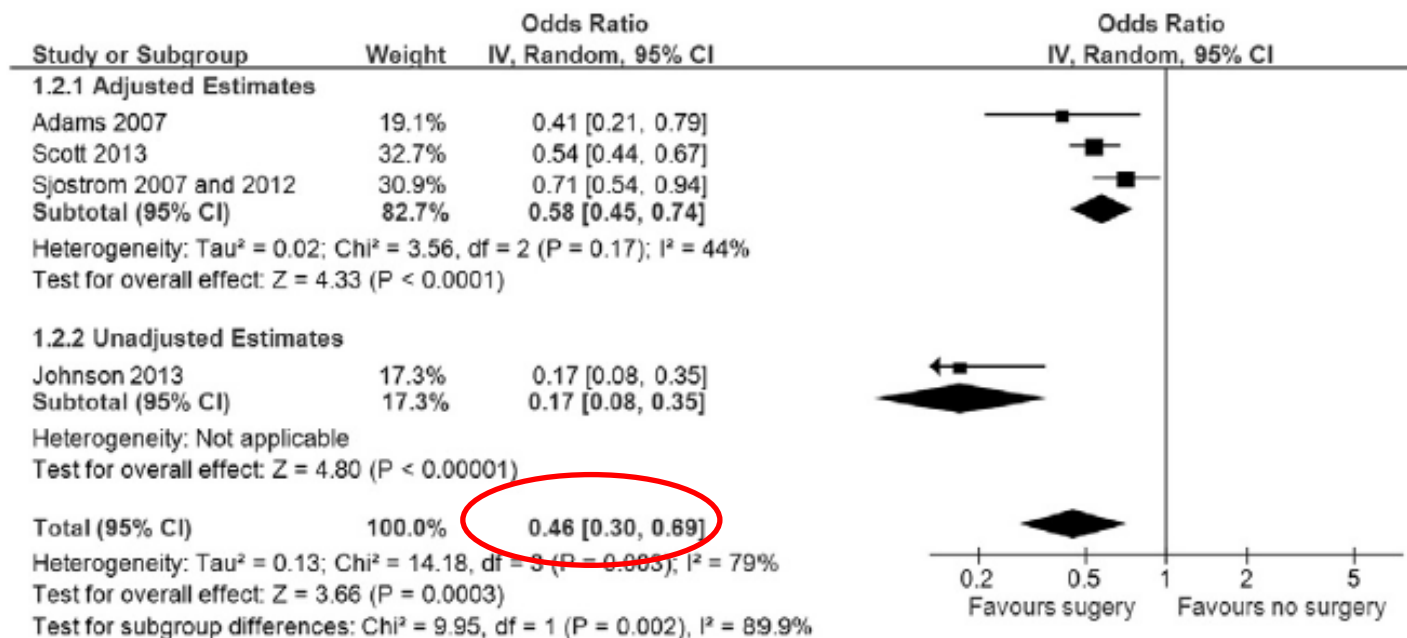


Fig. 4. Meta-analysis of stroke risk after bariatric surgery as compared to no surgery.

Bariatric surgery and its impact on cardiovascular disease and mortality: A systematic review and meta-analysis

Conclusió

Els estudis observacionals actuals proporcionen evidència consistent que els pacients amb obesitat mòrbida sotmesos a cirurgia bariàtrica tenen menors taxes d'IAM (1,3 vs 2,5%), AVC (0,8 vs 1,5%) i mortalitat (3,6 vs 11,4%) que els pacients control no quirúrgics.

Review article: the nutritional and pharmacological consequences of obesity surgery

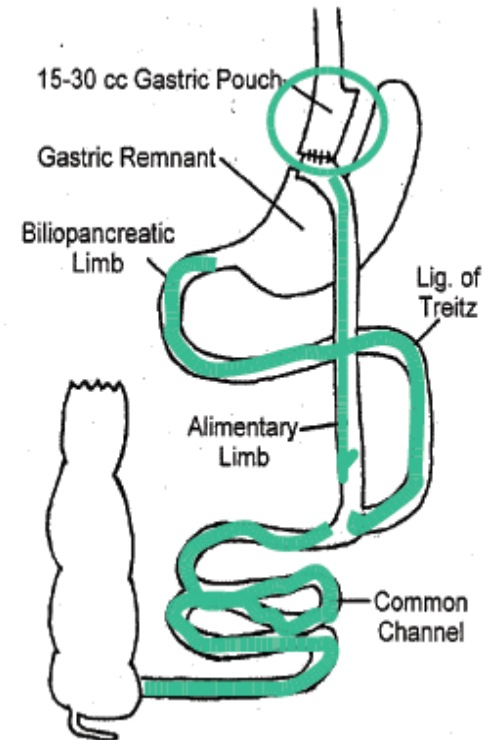
Causes

tèchniques restrictives



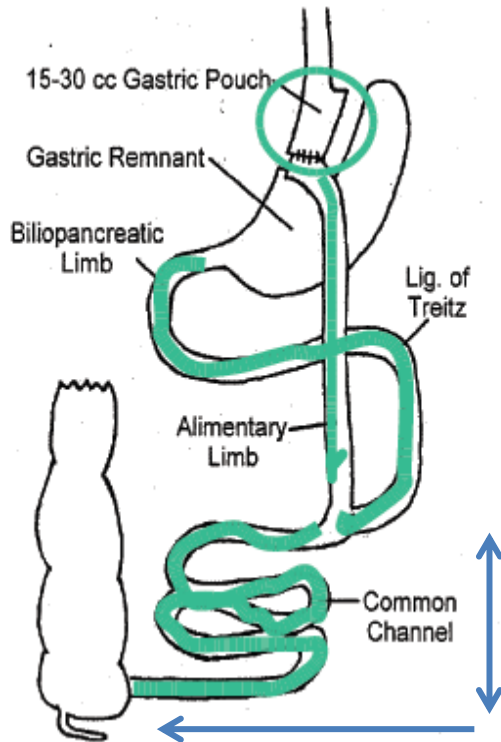
Sleeve

tèchniques bypass

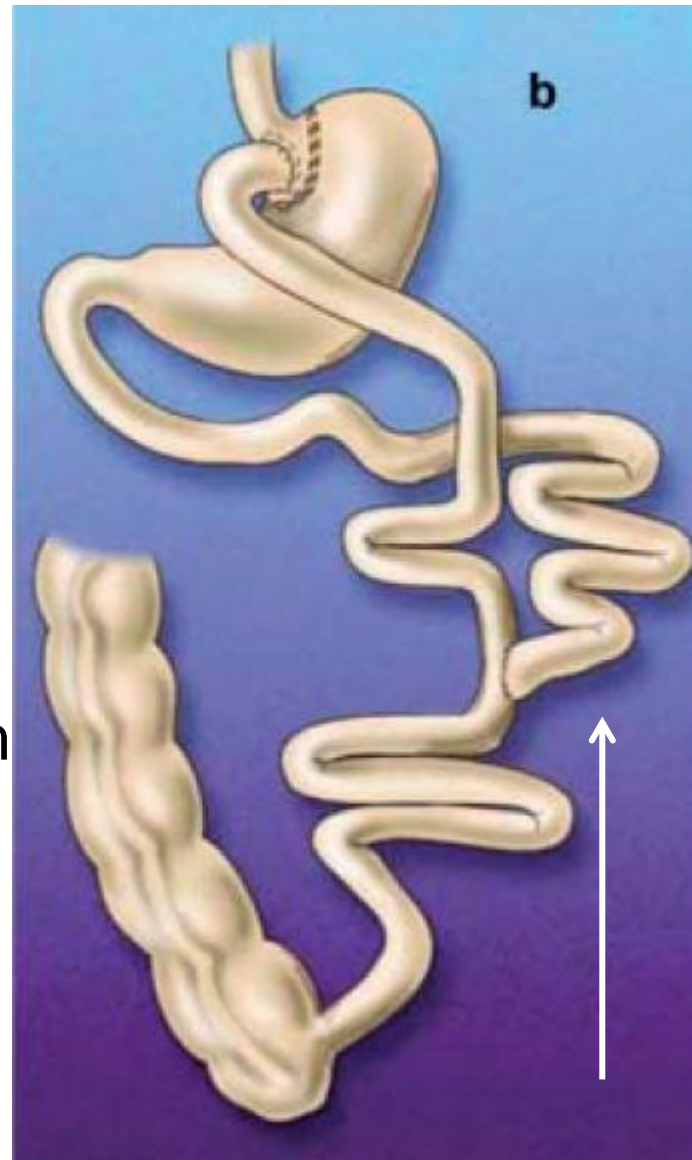


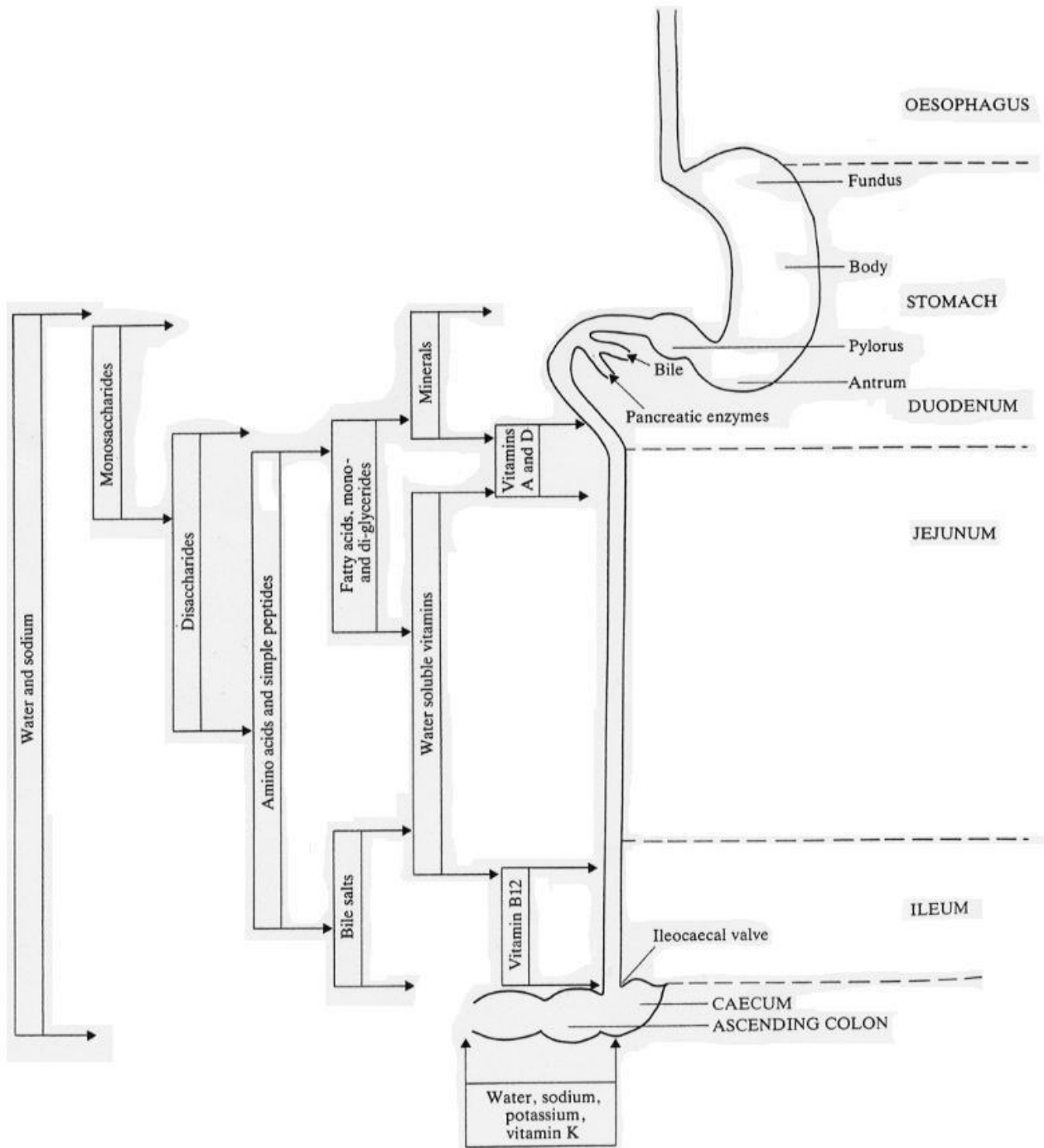
Bypass gàstic
Roux-en -y

Tractament quirúrgic: tècniques bypass



Bypass gàstric
Roux-en -y





| Macro-/ micronutrient | Post-OP deficiency | Risk factors | Signs and symptoms | Suggested supplementation | |
|--------------------------|-----------------------|--|--|--|---|
| | | | | Prevention | Treatment |
| Protein | 3–18% | Low protein (and energy) intakes, intercurrent illness, extreme weight loss (i.e. low food intake) short common channel | Weakness, decreased muscle mass, brittle hair, generalised oedema | Recommended intake: 60–120 g/day (dairy, fish, eggs, meat) or oral protein supplements | Enteral or parenteral nutrition; reversal of surgical procedure |
| Calcium | Approx. 10% | Pre-existing/deficiency, vitamin D deficiency, RYGB, BPD-DS, LSG, insufficient supplementation with calcium and/or vitamin D | Low bone density, osteoporosis, muscle contractions, pain, spasms, paresthesia | Oral calcium citrate, 1200–2000 mg/day | (bisphosphonates to be considered if T-score <2.5) |
| Magnesium | 32% | Pre-existing deficiency, vitamin D deficiency, RYGB, BPD-DS, insufficient supplementation with magnesium and/or vitamin D | Muscle contractions, pain, spasms, osteoporosis | Oral magnesium citrate, 300 mg/day | |

| Macro-/micronutrient | Post-OP deficiency | Risk factors | Signs and symptoms | Suggested supplementation | |
|-------------------------------------|---|---|---|--|---|
| | | | | Prevention | Treatment |
| Vitamin B ₁₂ (cobalamin) | Post-BPD/RYGB 4–62% after 2 years, 19–35% after 5 years | Decreased meat and dairy intakes, malabsorptive procedure (GBP), extreme weight loss (i.e. low food intake) | Pernicious anaemia, tingling in fingers and toes, depression, dementia, ataxia, | Oral supplementation (RYGB/BPD-DS): 1000 µg/week (1 ampoule) orally or 250–350 µg/day orally or 1000 µg/month intramuscularly or 3000 µg every 6 months intramuscularly | 1000 or 2000 µg/day (1–2 ampoules) orally or 1000 µg/week intramuscularly |
| Folic acid | 9–38% | Low intake, low adherence with supplements | Macrocytic anaemia, palpitations, fatigue, neural tube defects | Routine multivitamin preparation during weight-loss phase, 800–1000 µg/day orally for all women of child-bearing age (included in multivitamin) | 1 mg/day orally for about 1–3 months |
| Vitamin A | % RYGB 8–11% BPD 61–69% | Malabsorptive procedure (BPD-DS > RYGB), extreme weight loss (i.e. low food intake) | Loss of nocturnal vision, itching, dry hair, xerophthalmia, decreased immunity | No recommendations | No corneal changes: 10 000–25 000 IU/day orally for 1–2 weeks. If corneal lesions present: 50 000–100 000 IU i.m. followed by 50 000 IU/day i.m. for 2 weeks |

| Macro-/ micronutrient | Post-OP deficiency | Risk factors | Signs and symptoms | Suggested supplementation | |
|--------------------------|---|---|---|---|--|
| | | | | Prevention | Treatment |
| Vitamin D | 25–80% | Malabsorption after SG, RYGB, BPD- DS | Osteomalacia (in adults), rickets (in children), arthralgia, depression, fasciculation, myalgia | Oral Vitamin D (400– 800 U/day) [ergocalciferol (vitamin D2) or cholecalciferol (vitamin D3)] or 100 000 U/3–6 months orally | Severe vitamin D deficiency: 50 000– 150 000 IU/day; if necessary: calcitriol [1,25 (OH)2D] orally |
| Iron | LSG 17% RYGB/ BPD 30% (45% after 2 years) | Pre-existing deficiency, menstruation (if excessive), BPD- DS, RYGB, SG, GI-bleeding, insufficient supplementation with iron, avoidance of meat, copper deficiency | Fatigue, impaired work performance and productivity, anaemia, inability to regulate body temperature, white fingernail beds | Oral ferrous sulphate 300 mg 2–3 times/day | Parenteral iron Administration according to Table 3 |

Review article: the nutritional and pharmacological consequences of obesity surgery

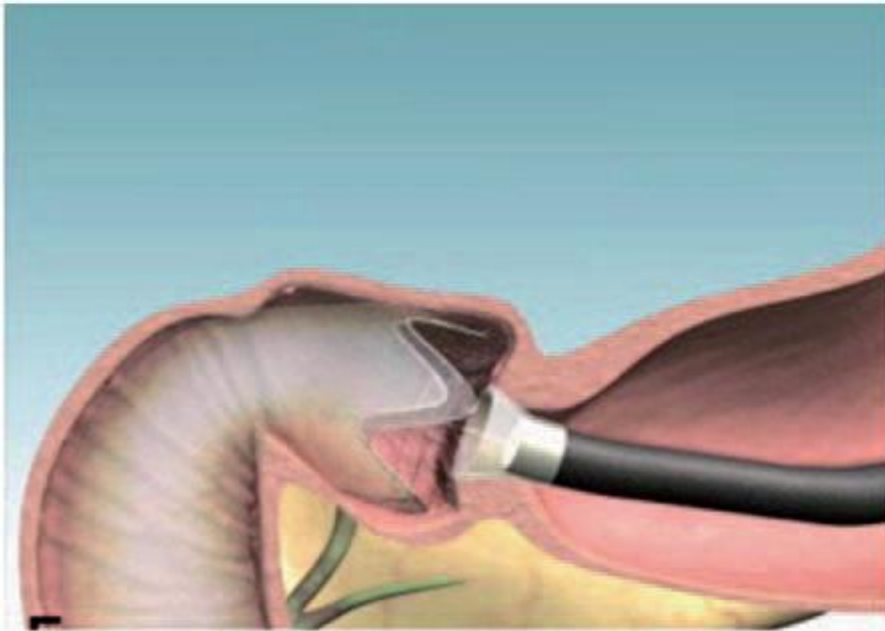
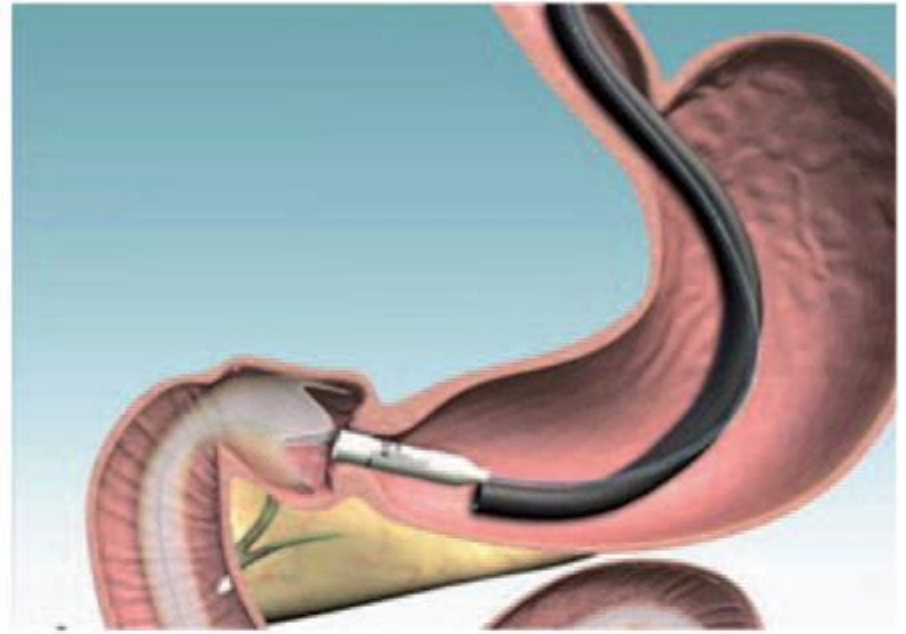
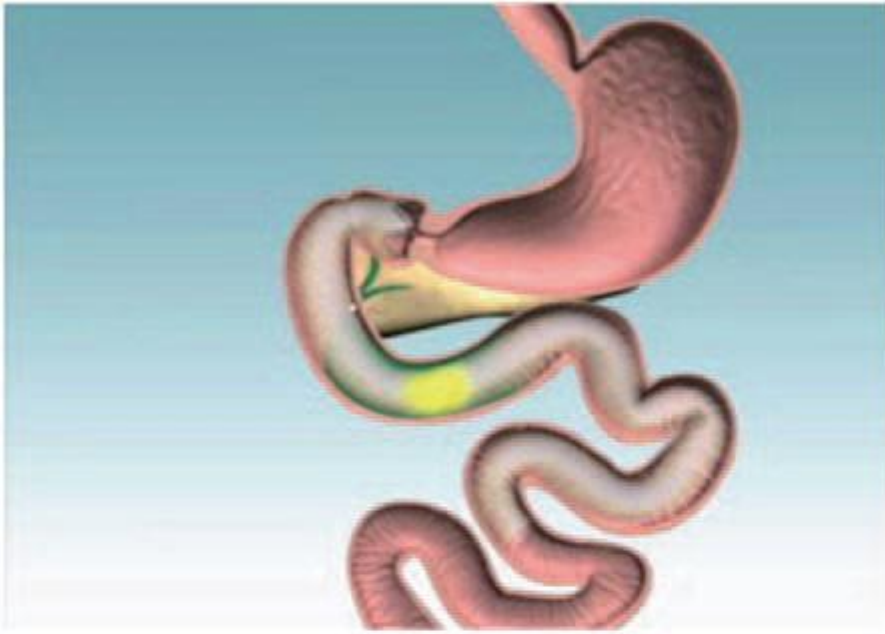
Causes:

- 1- ↓ extensió mucosa gàstrica amb canvis de PH
- 2- exclusió part pròxima budell prim
- 3- ús de inhibidors de la bomba de protons

↓ biodisponibilitat

- antibiòtics (nitrofurantoina, amoxicillina, penicillina)
- immunosupressors (ciclosporina)
- levotiroxina
- anticonvulsius (fenytoina, fenobarbital)
- Antidepressius tricíclics i inhibidors selectius serotonina

EndoBarrier

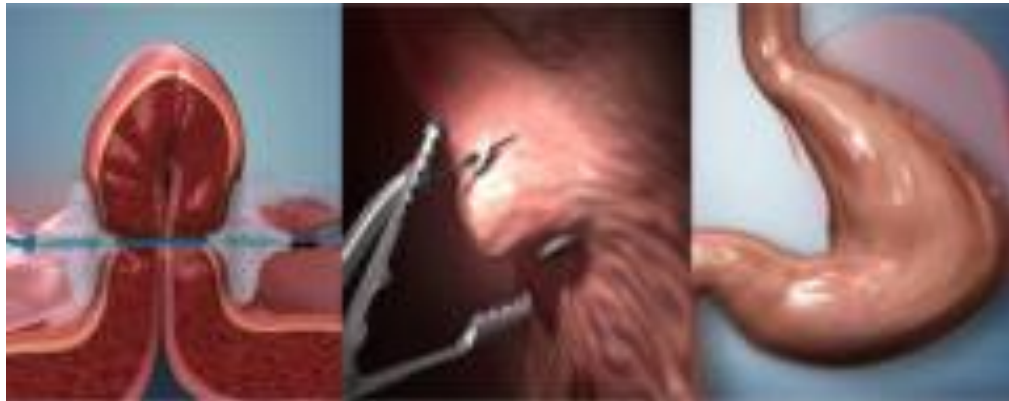


Tractament quirúrgic Tècniques noves

Laparoscopic Gastric Greater Curvature Plication (LGGCP)



Primary Obesity Surgery Endolumenal (POSE)



MÉTODO POSE

TRATAMIENTO
ENDOSCÓPICO
OBESIDAD

AspireAssist

