

糖尿病與減重治療的 最新發展

D A T E

2025.11.02

S P E C I A L T Y

內分泌新陳代謝科

S P E A K E R

林彥博 MD. MPH.

Disclosure

I was invited as a speaker presenting on the topic of diabetes and weight management. I have no financial relationships, sponsorships, or affiliations with any pharmaceutical companies, medical device manufacturers, or other commercial entities related to the content of this presentation.

- 1 肥胖與糖尿病的前世今生
- 2 肥胖症現有的減重方案
- 3 研發中的新興減重療法
- 4 結論

OUTLINE

自古以來，多吃糖與肥胖密不可分



Banting, William¹. Letter on Corpulence: Addressed to the Public. London, 1869

1. Banting, W. (1993), Letter on Corpulence, Addressed to the Public. Obesity Research, 1: 153-163. <https://doi.org/10.1002/j.1550-8528.1993.tb00605.x>

Baseline parameter

5'5" (165cm), 202 pounds (91.6 kg)

BMI 33.5

Dietary table

Breakfast	Buttered toast, tea with PLENTY sugar
Lunch	Meat, beer, MUCH bread, pastry
Tea-time	Bread, tea with PLENTY sugar
Dinner	Fruit tart, bread/milk

... These, said my excellent adviser, contain starch and saccharine (糖精) matter, tending to create fat, and should be avoided altogether...

自古以來，多吃糖與肥胖密不可分



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Starch restriction (1 ounce/meal),
Protein rich (3-6 ounce/meal)**

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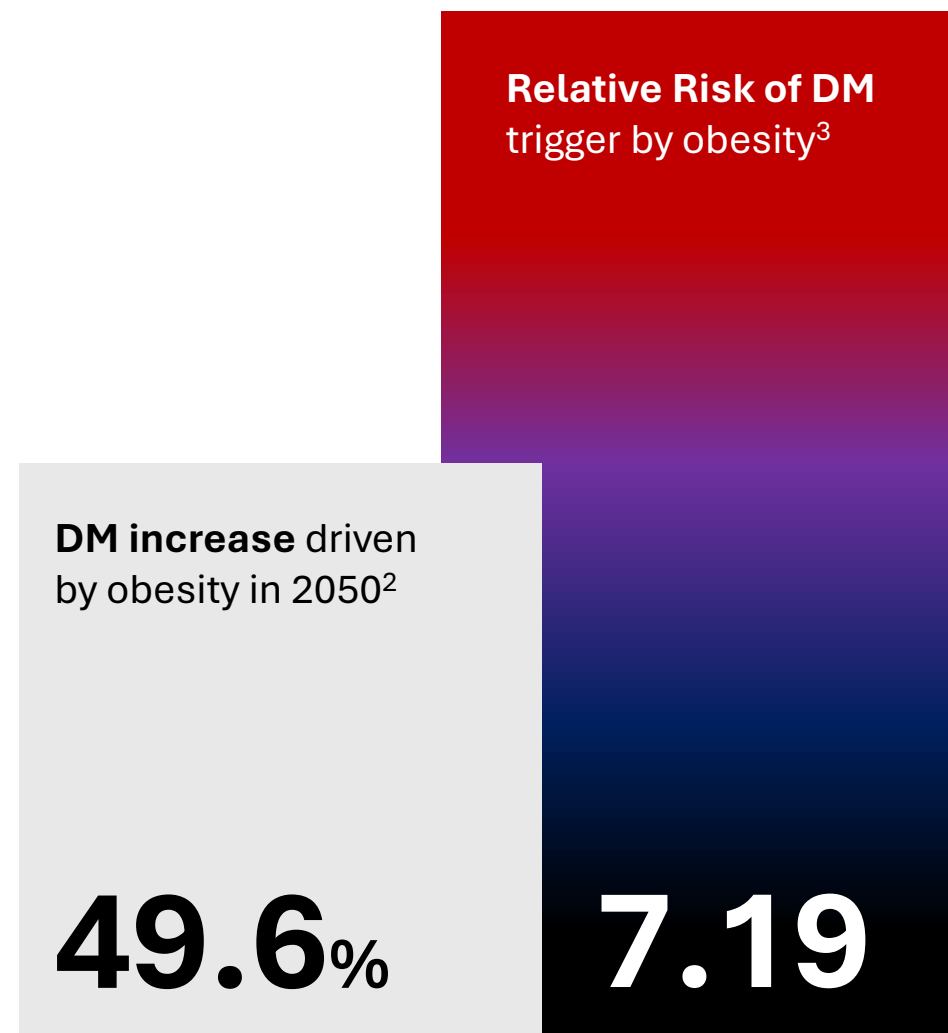
BMI 25.5

Lose 50 pounds (-22kg), waist 12 inches (-30 cm) in 46 weeks

糖尿病與肥胖的關係就像 量子交纏

Globally, the prevalence of obesity among people with diabetes is estimated to be around **80%**¹

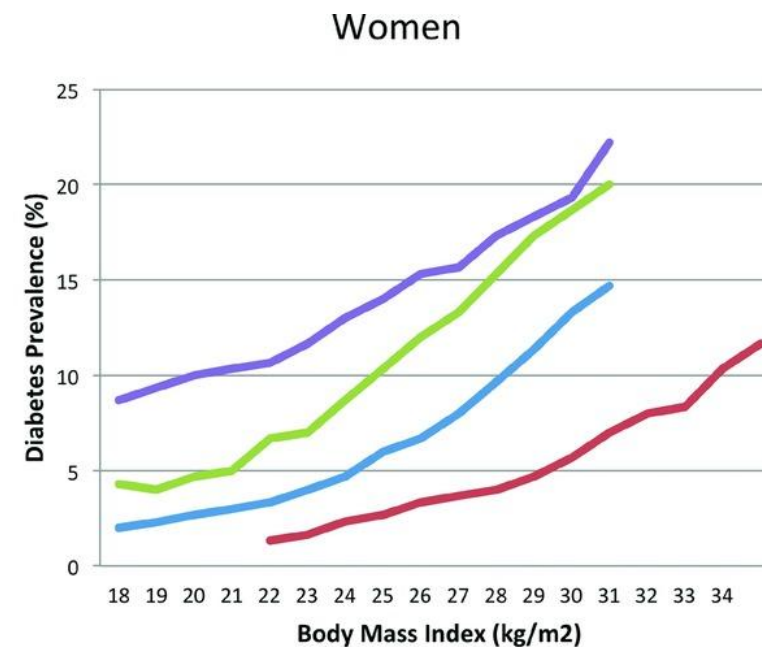
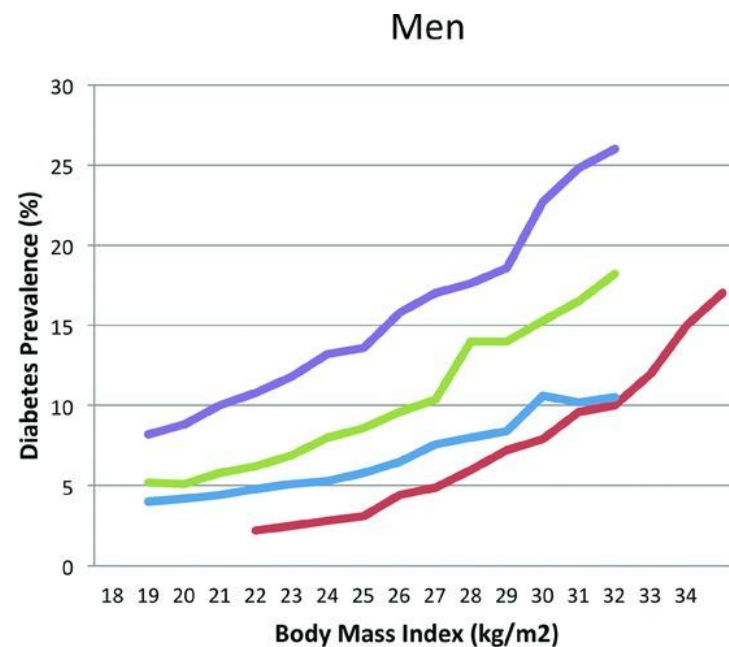
1. World Obesity Federation. World Obesity Atlas 2025. London: World Obesity Federation, 2025
2. Lancet. 2023 Jul 15;402(10397):203-234. doi: 10.1016/S0140-6736(23)01301-6.
3. Diabetes Res Clin Pract. 2010 Sep;89(3):309-19. doi: 10.1016/j.diabres.



雖然肥胖會增加DM風險，但不是每種肥胖都一樣

Ethnicity	BMI (Kg/m ²)
Asian Chinese, Japanese, Indian, Korean, Vietnamese	22.6 – 26.4
Black	30.9 – 31.2
Hispanic	29.1 – 29.7
White	27.6 – 28.3

Incident diabetes in **Asian American populations**¹



DECODA Study²

Diabetes Epidemiology: Collaborative Analysis of Diagnostic Criteria in Asia

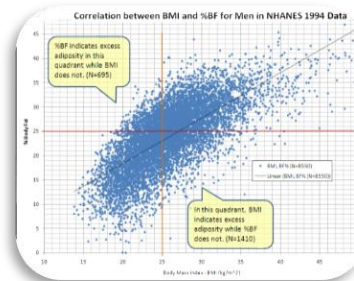
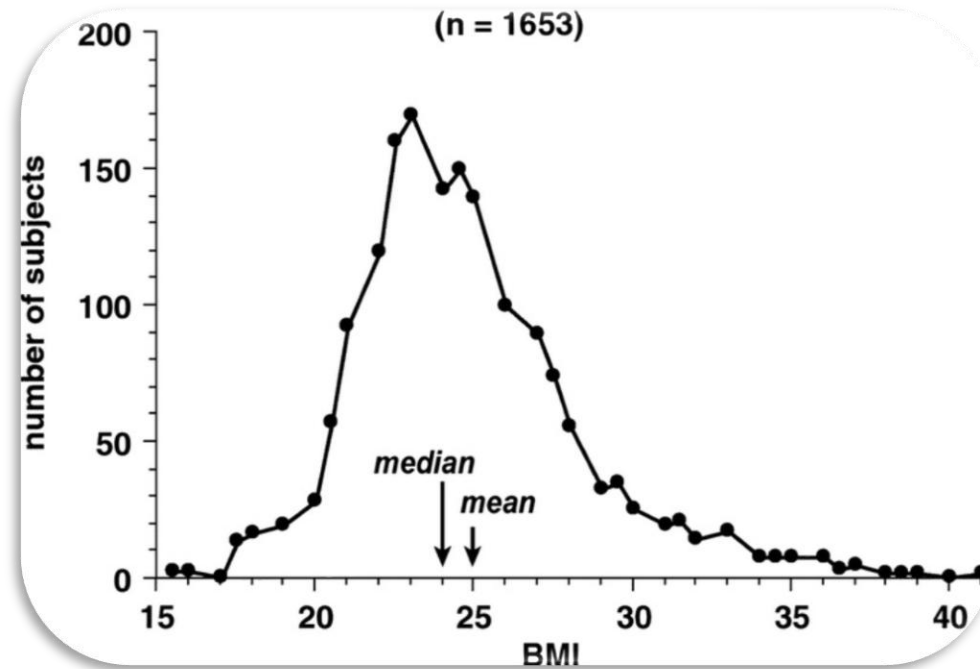
1. Diabetes Care. 2015 Jan;38(1):150-8. 2. Ann NY Acad Sci. 2013 Apr;1281(1):64-91.

或許，肥胖指的不是重量，而是「質量」

Distribution of BMI in Adult American Men and Women¹

1923

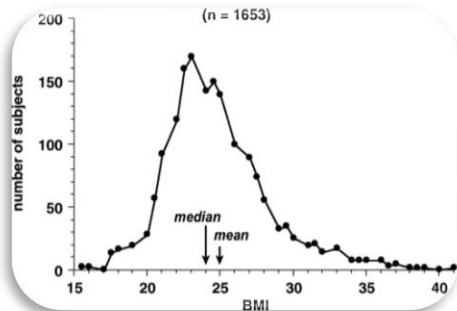
Correlation between BMI and Body Fat%



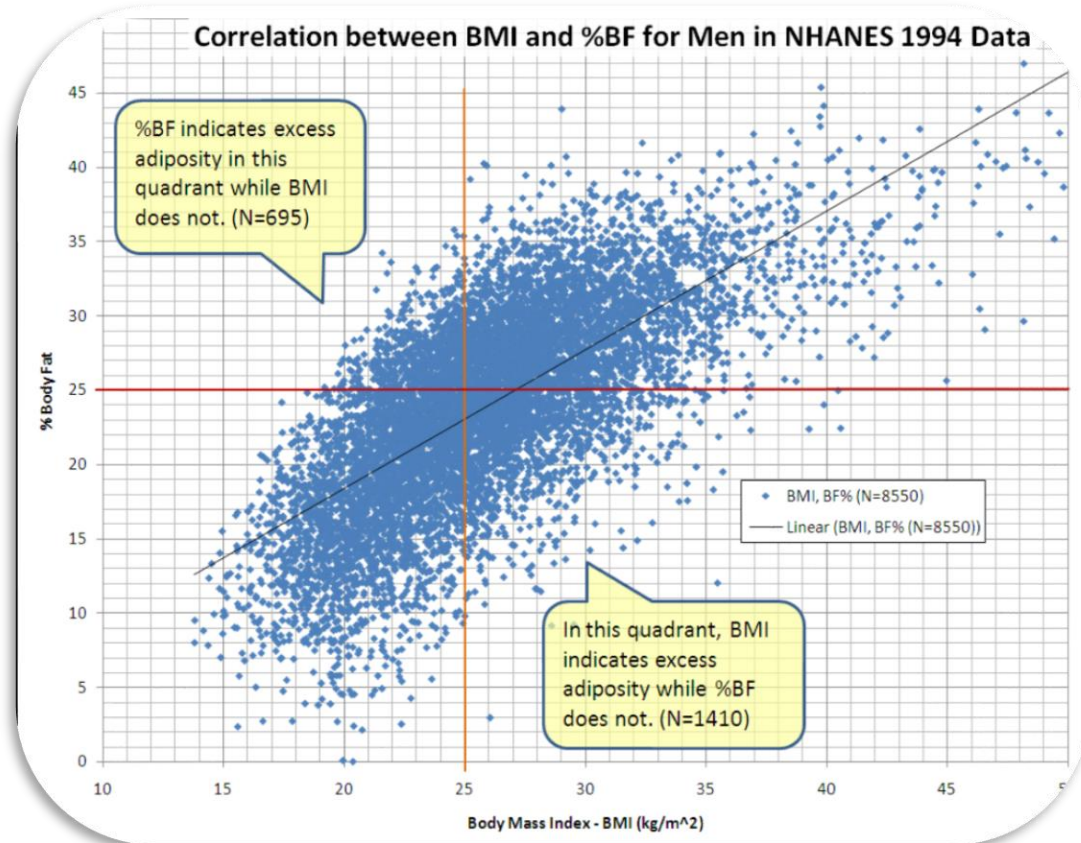
1. Rony H. The homeostatic body weight regulation. Obesity and Leanness. Philadelphia, PA: Lea & Febiger; 1940: 192– 209.
2. Int J Obes (Lond). 2008 Jun;32(6):959-66. doi: 10.1038/ijo.2008.11.
3. Obes Facts. 2019;12(2):131-136. doi: 10.1159/000497124.

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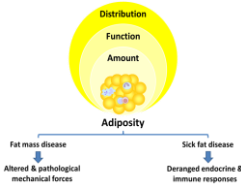
Distribution of BMI in Adult American Men and Women¹



Correlation between BMI and Body Fat%²



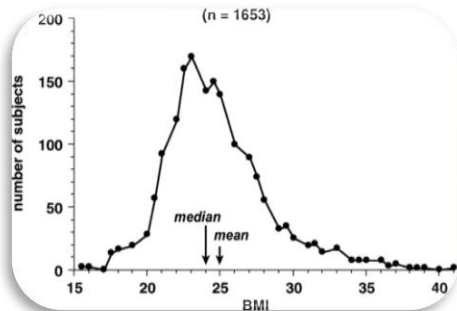
Beyond BMI - A
(Adiposity-Bas



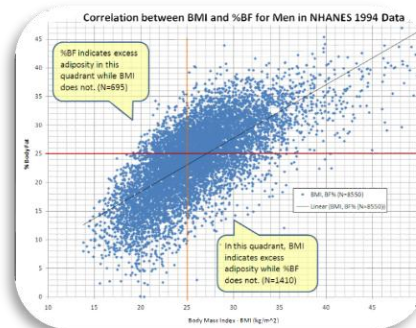
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2. Int J Obes (Lond). 2008 Jun;32(6):959-66. doi: 10.1038/ijo.2008.11.
3. Obes Facts. 2019;12(2):131-136. doi: 10.1159/000497124.

肥胖的定義不應該只有數字，而是風險評估

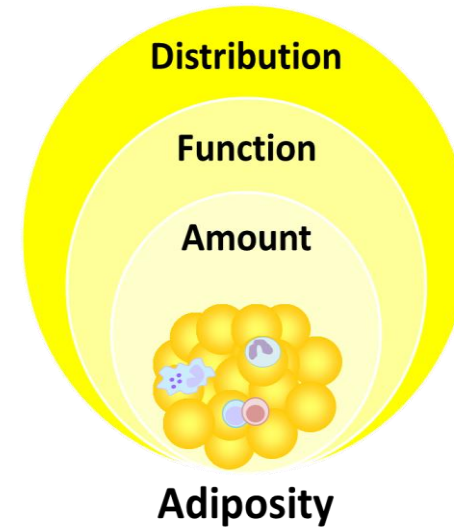
Distribution of BMI in Adult American Men and Women¹



Correlation between BMI and Body Fat%²



Beyond BMI - ABCD of Obesity (Adiposity-Based Chronic Disease)³



Fat mass disease

↓
Altered & pathological
mechanical forces

Sick fat disease

↓
Deranged endocrine &
immune responses

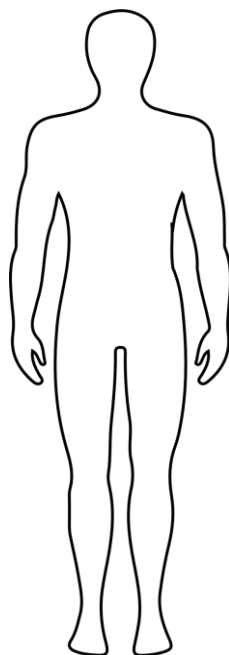
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2. Int J Obes (Lond). 2008 Jun;32(6):959-66. doi: 10.1038/ijo.2008.11.
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那些脂肪分佈要注意？**內臟脂肪**要特別小心

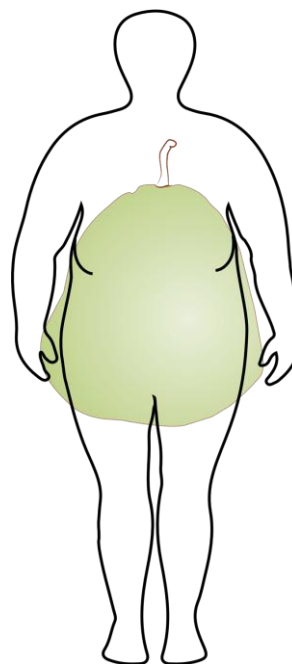
Peripheral obesity

Central obesity

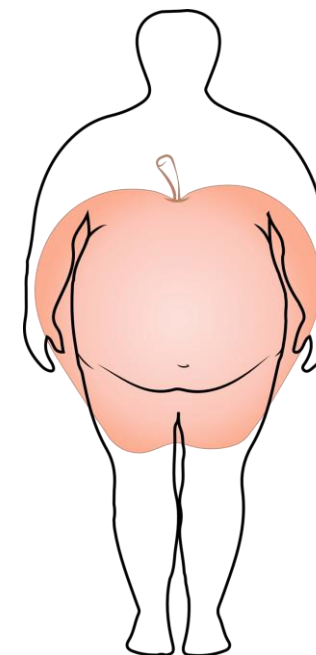
Healthy range BMI¹
Healthy range WHR¹



High BMI¹
Low WHR¹



High BMI¹
High WHR¹



Low risk¹

High risk¹

BMI=Body Mass Index; IAS=International Atherosclerosis Society; ICCR=International Chair on Cardiometabolic Risk; WHR=Waist-to-Hip Ratio.

1. Data from Fu J, Hofker M, Wijmenga C. Cell Metab. 2015;21(4):507-508. 2. Ross R, Neeland IJ, Yamashita S, et al. Nat Rev Endocrinol. 2020;16(3):177-189.

內臟脂肪堆積會導致胰島素阻抗更高的惡性循環

骨骼肌

肝臟

血液

飲食中糖分轉
換肝醣比例¹

80%

400 gram

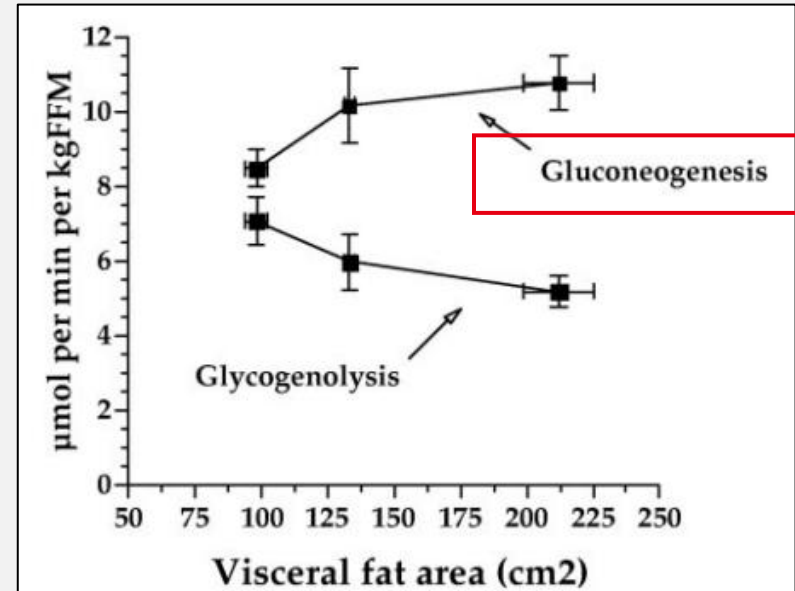
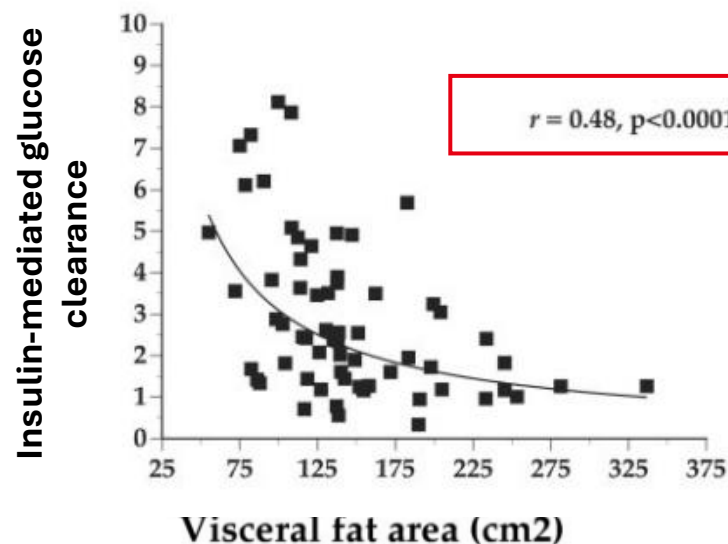
20%

100 gram

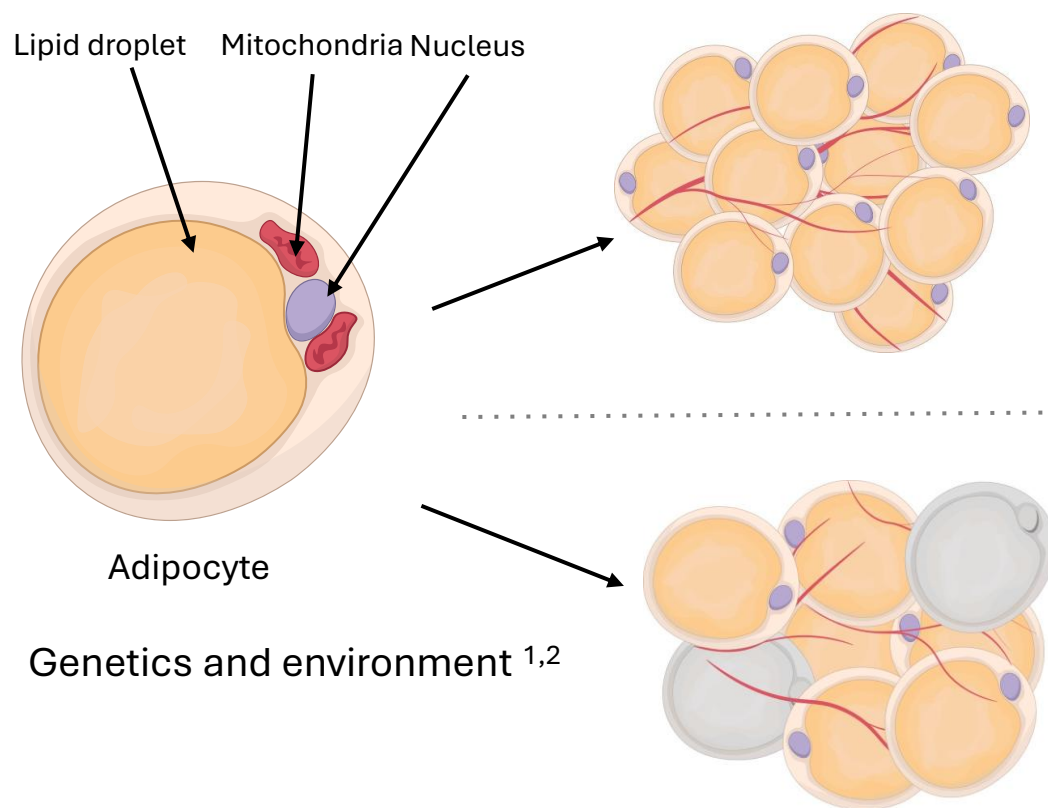
0.1%

3 gram

Insulin sensitivity was reciprocally related to **visceral fat independently of body mass index** (partial $r = 0.33$; $P = 0.01$)²



一旦脂肪細胞「太胖」，風險就變高



Hyperplasia^{1,2}

- ↑ Cell number
- ↓ FFA release
- ↑ Insulin sensitivity
- ↑ Adiponectin
- ↓ Pro-inflammatory cytokines
- ↓ Immune cell recruitment
- ↓ Hypoxia and fibrosis



Healthy adipose tissue expansion^{1,2}

Hypertrophy^{1,2}

- ↑ Cell size
- ↑ FFA release
- ↓ Insulin sensitivity
- ↓ Adiponectin
- ↑ Pro-inflammatory cytokines
- ↑ Immune cell recruitment
- ↑ Hypoxia and fibrosis



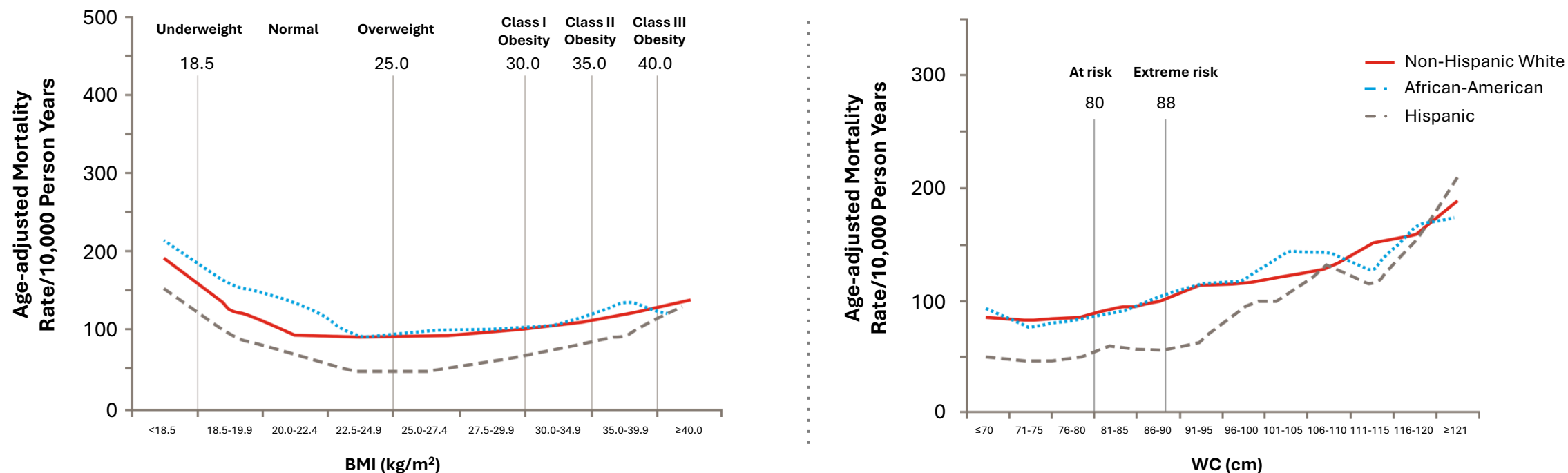
Inability to expand^{1,2}
Systemic FFA release^{1,2}
Ectopic fat deposition^{1,2}

FFA=Free Fatty Acid.

1. Data from Choe SS, et al. Front Endocrinol (Lausanne). 2016;7:30. 2. Data from Hammarstedt A, et al. Physiol Rev. 2018;98(4):1911-1941.

健康的體重可能不能太輕，但腰圍則不要太大

Age-adjusted all-cause mortality with BMI and WC by race/ethnicity ¹



an increase in WC of **1 cm** is associated with a **2% increased risk** of future CVD

BMI=Body Mass Index; CVD=Cardiovascular Disease; WC=Waist Circumference.

1. Data from Chen Z, et al. J Am Geriatr Soc. 2017;65(9):1907-1915. 2. de Koning L, et al. Eur Heart J. 2007;28(7):850-856.

於是，為了活下來 人類開始減肥

Q: what is the main
reason for being
obese?

overeating

吃太多

sedentary
habit

動太少

metabolic
dysfunction

新陳代
謝太慢

於是，為了活下來 人類開始減肥

Q: what is the main
reason for being
obese?

吃太多

少吃一點
(但很難)

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動太少

metabolic
dysfunction

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多動一點
(不可能)

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dysfunction

新陳代
謝太慢

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吃太多

少吃一點
(但很難)

動太少

多動一點
(不可能)

新陳代
謝太慢

就是它了!!

被問到代謝慢怎麼辦，實證告訴你不夠老不算數

REPORT

POPULATION

6,600

FEMALE RATIO

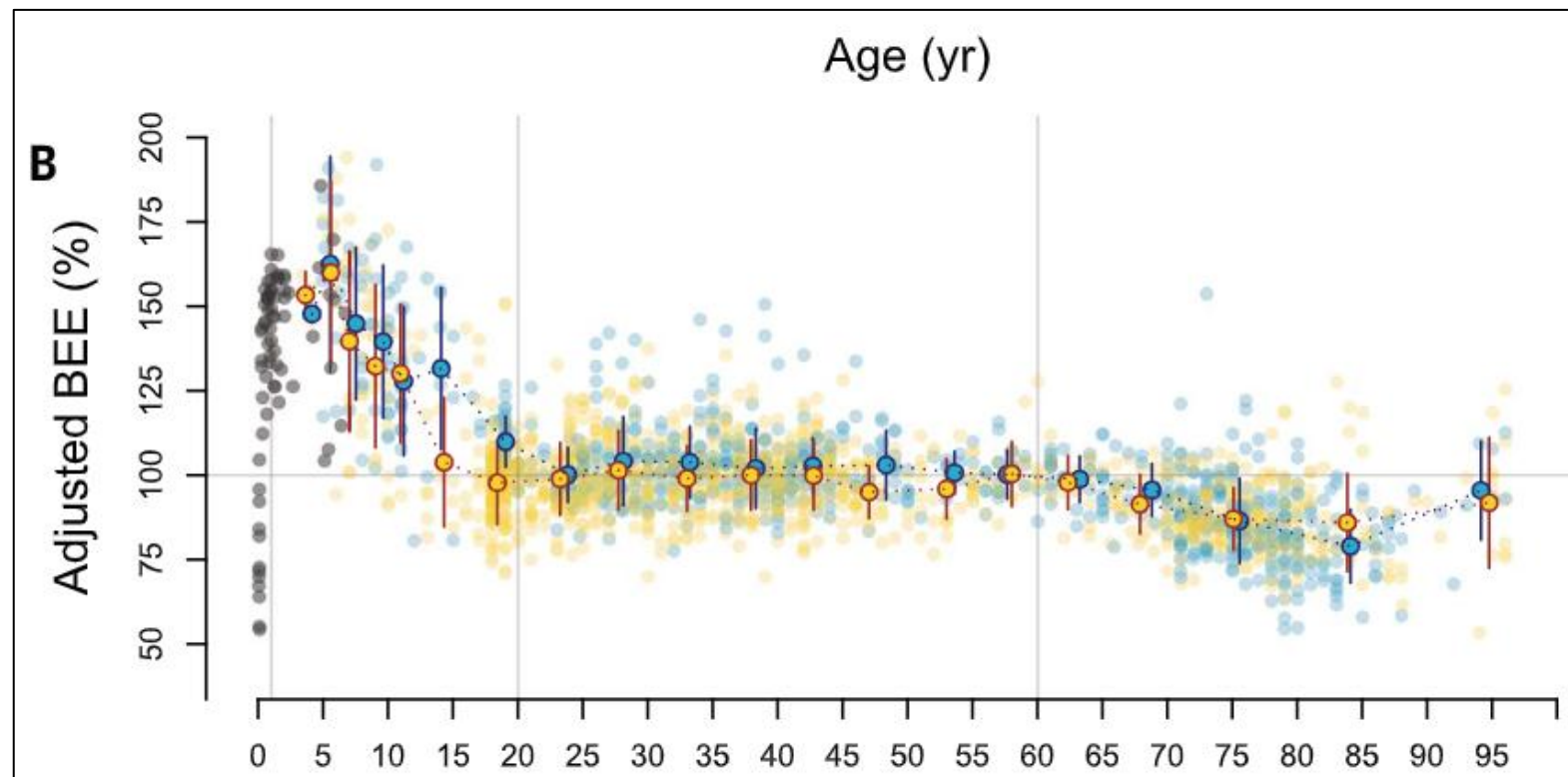
64%

AGE

8 days to 95 y/o

DATABASE

29 countries



BEE: basal energy expenditure
Adjusted by fat-free mass and fat-mass

從歷史的失敗中看出，增加代謝可能不是正解

1900~1940



Event

Babinski Frohlich syndrome (hypothalamus dysfunction)
World war I and World war II

Drug

Thyroxine

Mechanism: Thermogenesis
Discontinuation: hyperthyroidism

1930~1940



Drug

DNP,
amphetamines

Mechanism: Increase metabolism
Discontinuation: cataract, hyperthermia,
death

1950~1980

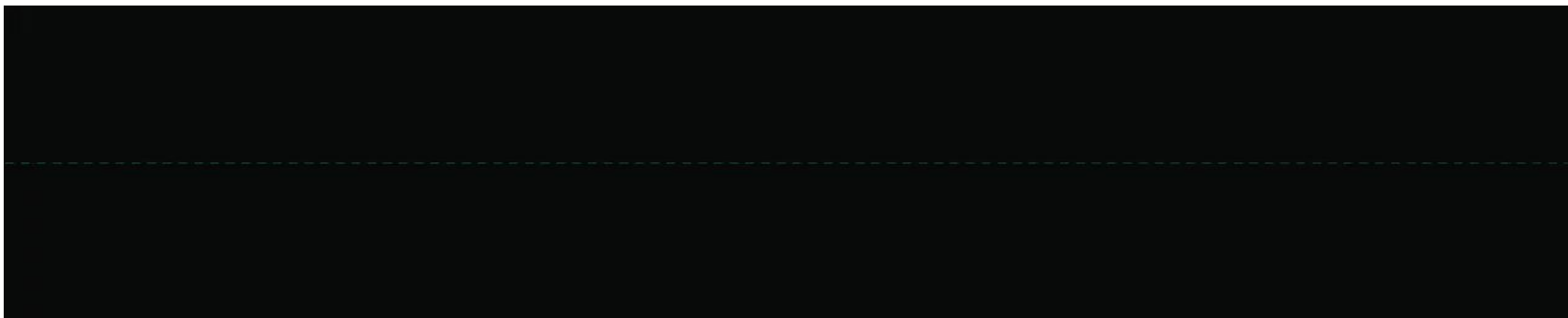


Drug

Cocktail era
(Rainbow drug)

Ingredient: amphetamines, thyroid
hormone, diuretics, and laxatives
Discontinuation: addiction

現在的AI很聰明，但通常也是要查證



Created by my patient with
using ChatGPT 4o and Suno Ai



鏡子說我可以再瘦一點。

我說——好啊，那我就變風。

早餐吃空氣，午餐吃夢想，

晚餐只剩 Wi-Fi 香。

從根本的原因來看，吃還是最重要的

+ Hunger:

Gut – Ghrelin (飢餓素)

- Hunger:

Small intestine:

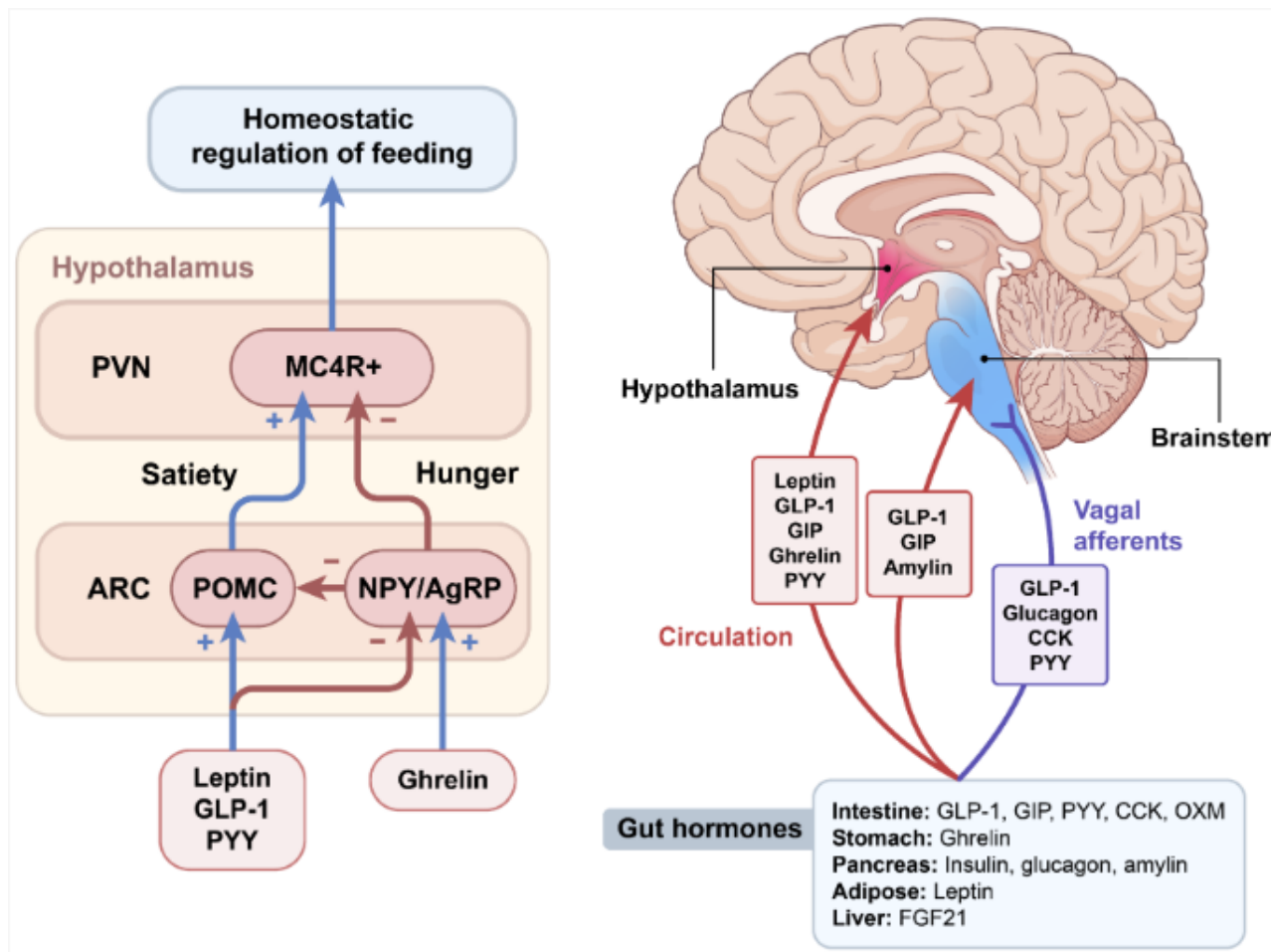
- **GLP-1**, PYY(L-cell)
- GIP (K-cell)
- CCK (I-cell)

Pancreas:

- Glucagon

Adipose tissue

- Leptin (瘦素)



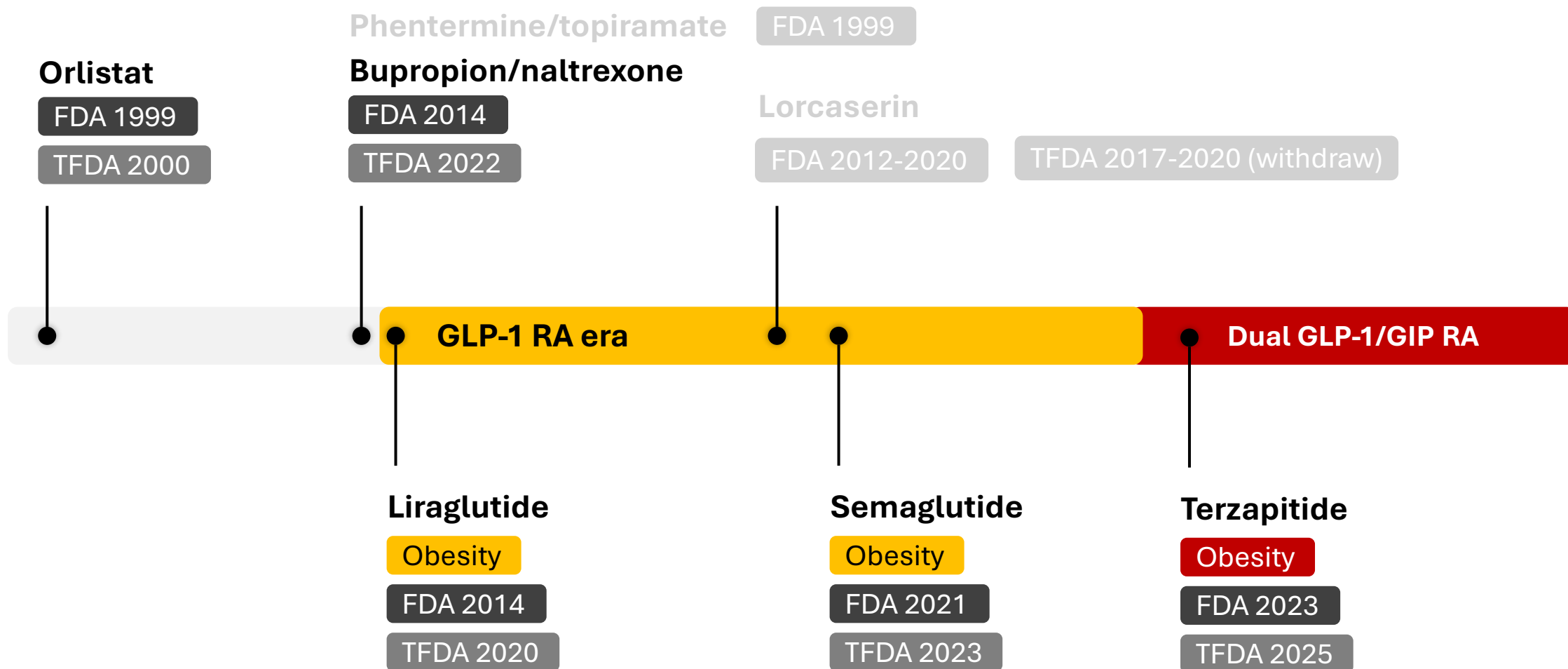
從根本的原因來看，吃還是最重要的



醫師我是不是
內分泌失調...

嘴巴失調啦!

FDA以及TFDA核准的減重藥^{1,2}

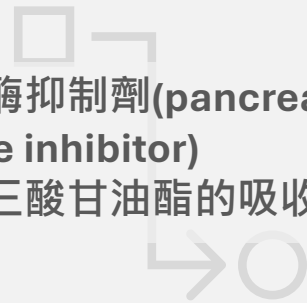


1. Chakhtoura M, et al. EClinicalMedicine. 2023;58:101882.; 2. GrandIG, et al. Lancet Reg Health Eur. 2024;47:101100.

1

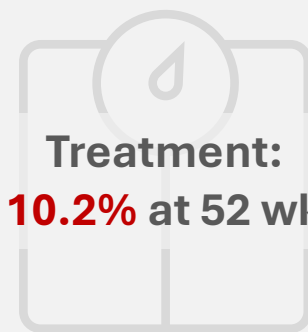
Orlistat (Xenical®)

European Multicenter Orlistat trial ¹



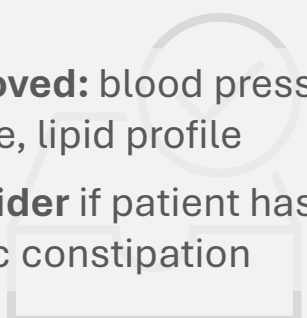
胰脂酶抑制劑(pancreatic
lipase inhibitor)
減少三酸甘油酯的吸收

Mechanism of Action



Treatment:
10.2% at 52 wk

**Mean weight loss from
baseline**



- Improved:** blood pressure, glucose, lipid profile
- Consider** if patient has chronic constipation

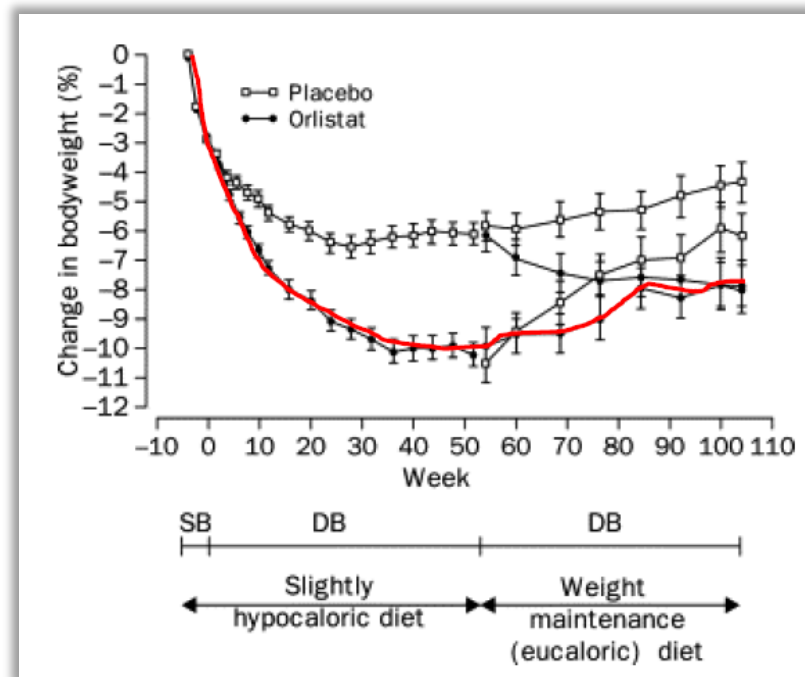
Additional benefits

1. Lancet. 1998 Jul 18;352(9123):167-72. doi: 10.1016/s0140-6736(97)11509-4.

Orlistat taken with an appropriate diet promotes clinically significant weight loss and reduces weight regain in obese patients over a 2-year period¹

BMI 28-47

Hypocaloric (-600 Kcal)



TFDA 適應症

成人: 配合低卡洛里飲食，適合肥胖病患的治療，包括有與肥胖相關危險因子之病患。

青少年: 對於肥胖青少年，只有當六個月以上療程的治療方法 (包括適合病患年齡的均衡飲食及矯正病患行為的運動計畫) 失敗時才可使用orlistat治療

1. Lancet. 1998 Jul 18;352(9123):167-72. doi: 10.1016/s0140-6736(97)11509-4.

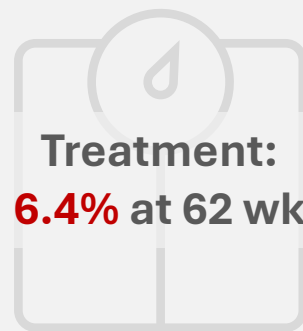
2

Naltrexone bupropion (Contrave®)

CONTRAVE Obesity Research-II (COR-II) ¹

Bupropion activates pro-opiomelanocortin (**POMC**) neurons in the hypothalamus, naltrexone blocks opioid-mediated pro-opiomelanocortin autoinhibition

Mechanism of Action

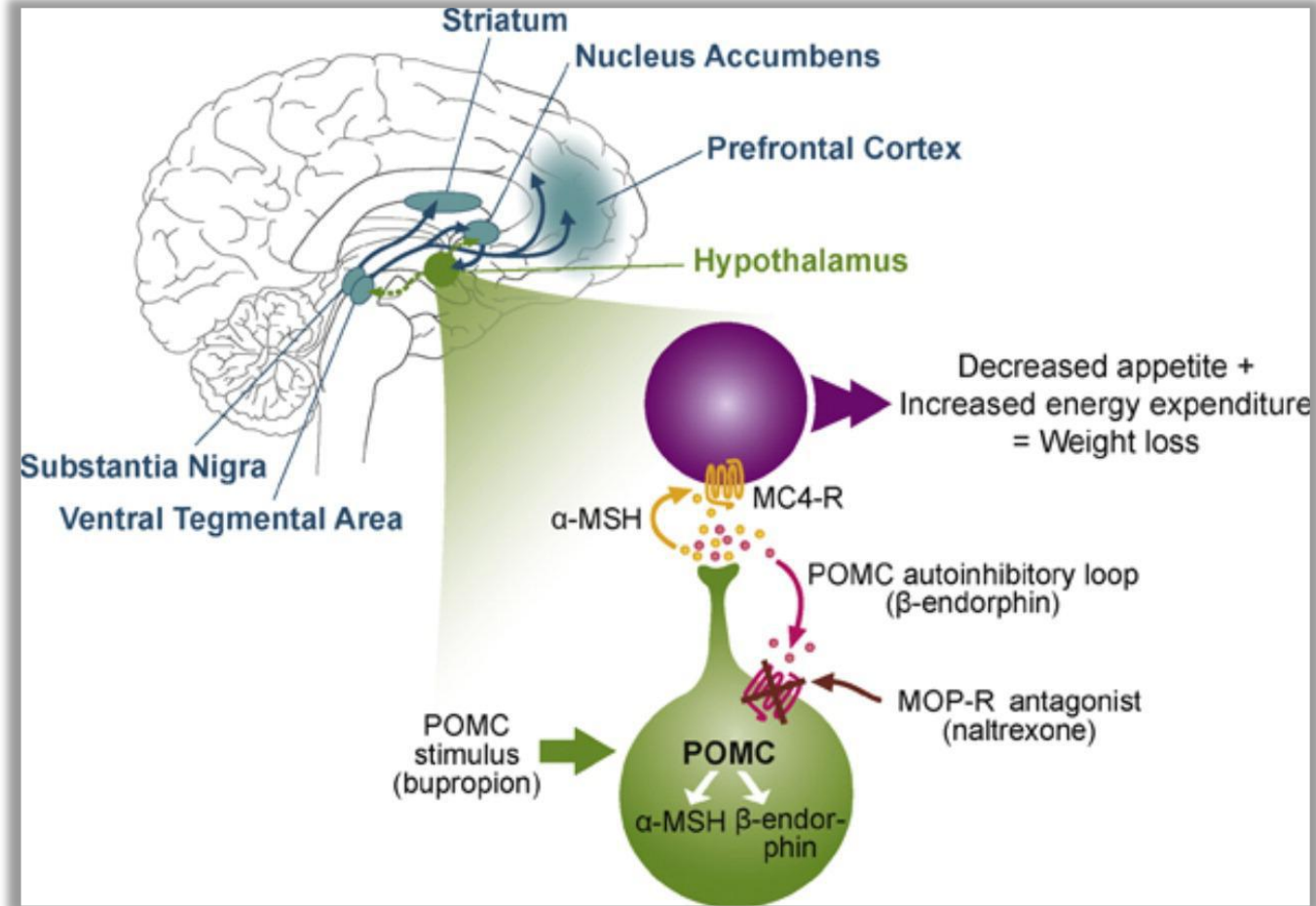


Mean weight loss from baseline

- **Improved:** waist circumference, HbA1c in type 2 diabetes, lipid profile
- **Consider** use in patients interested in reducing tobacco or alcohol use

Additional benefits

1. Obesity (Silver Spring). 2013 May;21(5):935-43. doi: 10.1002/oby.20309.



Bupropion:

$\uparrow \alpha$ -MSH $\rightarrow \uparrow$ POMC
(降低飢餓感)

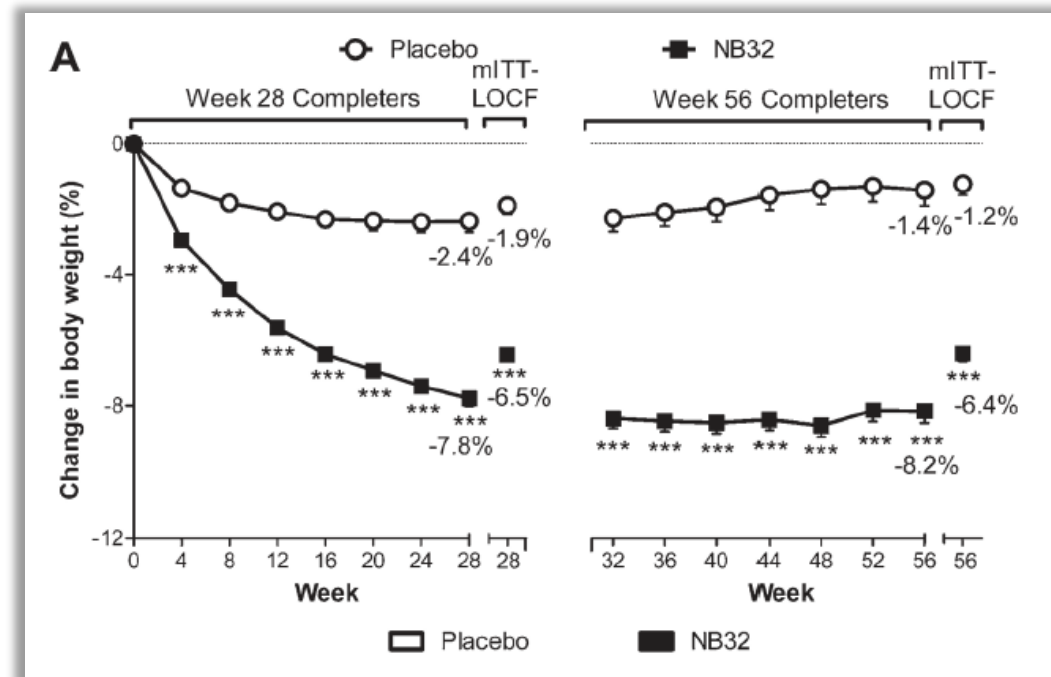
Naltrexone:

$\boxtimes \beta$ -endorphin $\rightarrow \uparrow$ POMC
(減少嘴饞)

Significantly greater weight loss was observed with naltrexone/bupropion versus placebo week 56 (-6.4% vs. -1.2%)¹

BMI 27-45

≥5% BW loss



TFDA 適應症

用於體重控制，做為低熱量飲食及增加體能活動外之輔助療法

適用對象: 成人病人且初始身體質量指數(BMI)為： $\geq 30 \text{ kg/m}^2$ ，或 $\geq 27 \text{ kg/m}^2$ 至 $< 30 \text{ kg/m}^2$ ，且病人至少有一項體重相關共病症，例如第二型糖尿病、血脂異常或已獲控制之高血壓。

Boxed Warning of Contrave®

自殺意念和行為(自殺傾向)

發生頻率未知

癲癇發作

發生頻率約0.1%。對於使用較高劑量康纖芙、本身患有特定疾病或同時服用其他藥物的病人，其發生癲癇機率較高。

增加類鴉片止痛劑過量風險

Naltrexone會阻斷類鴉片止痛劑(例如海洛因、美沙酮或類鴉片止痛劑)效果。請勿試圖服用大量類鴉片止痛劑（包括含有類鴉片藥物的藥物，如海洛因或處方止痛藥）去克服此阻斷作用，這將會導致嚴重傷害、昏迷或死亡

突然戒斷類鴉片止痛劑

3

Liraglutide 3mg/day (Saxenda®)

Satiety and Clinical Adiposity - Liraglutide Evidence (SCALE)¹



Mechanism of Action



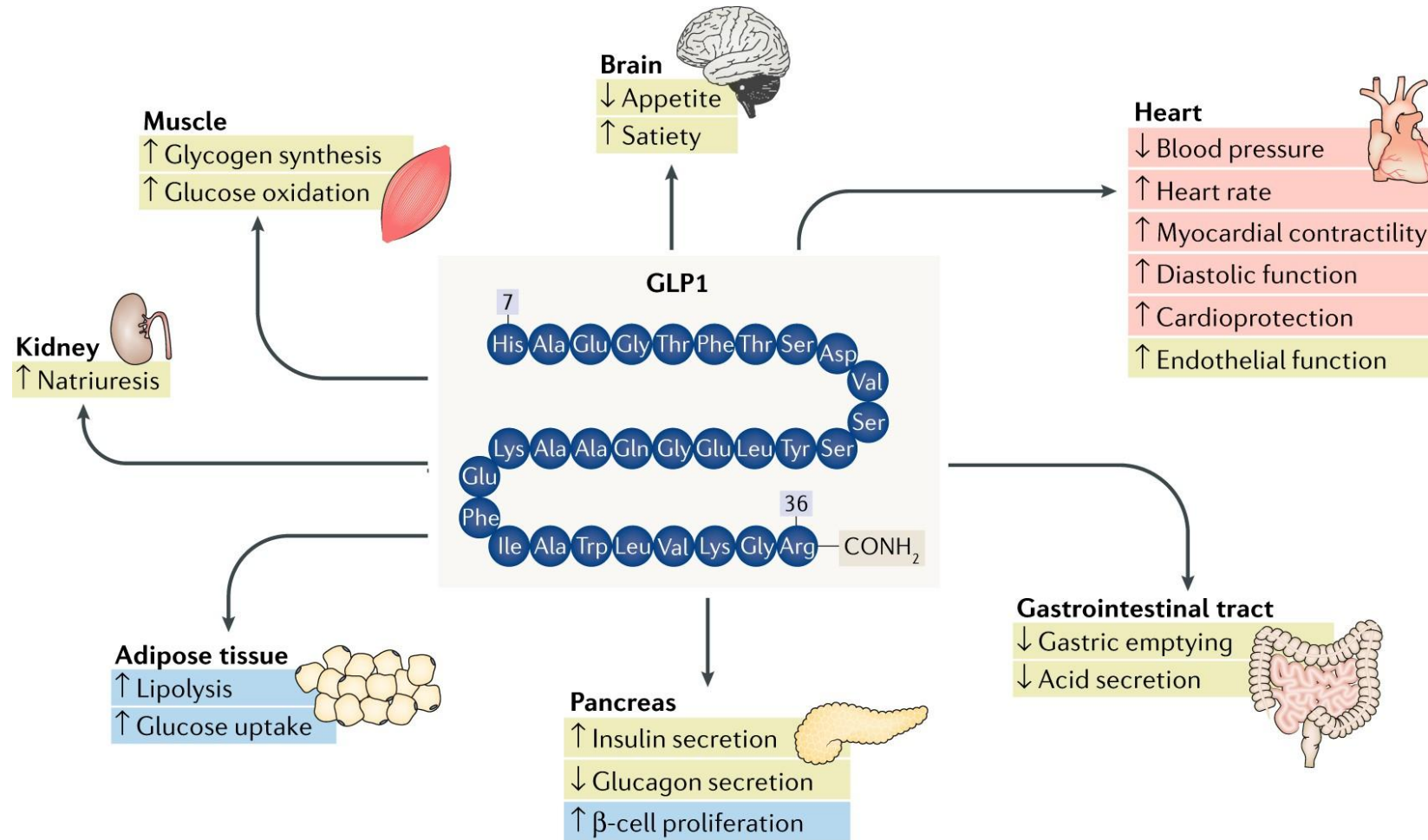
**Mean weight loss from
baseline**

•**Improved:** waist
circumference, blood
pressure, HbA1c, CVD events,
lipid profile

Additional benefits

1. N Engl J Med. 2015 Jul 2;373(1):11-22. doi: 10.1056/NEJMoa1411892.

Physiological effect of GLP-1



A total of **63.2%** of the patients in the liraglutide group as compared with 27.1% in the placebo group lost at least 5% of their body weight ($P < 0.001$)¹

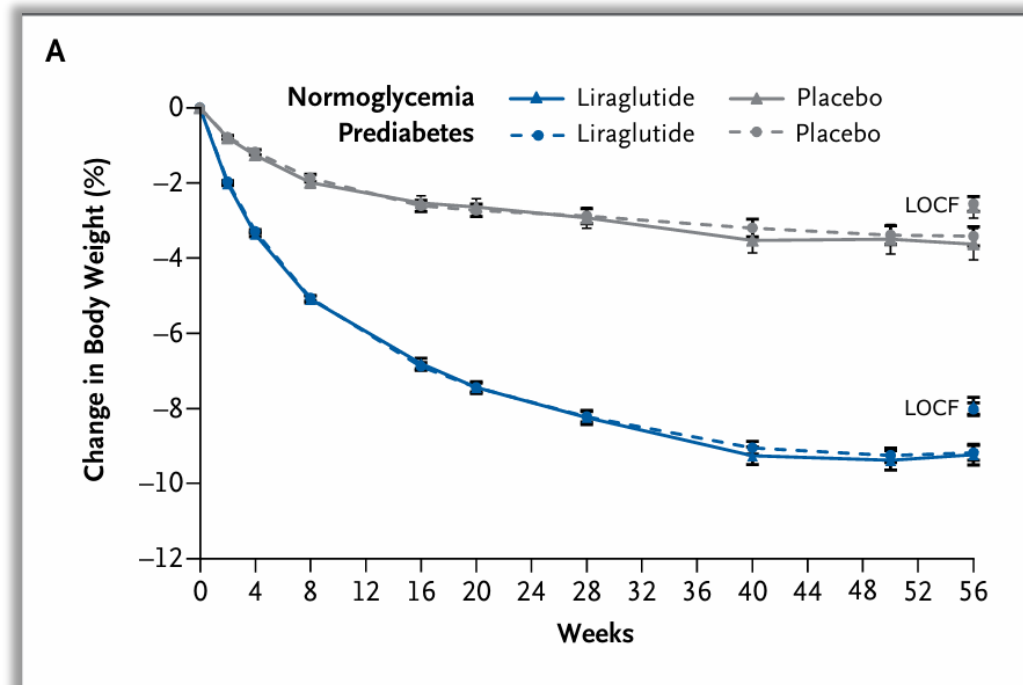
BMI ≥ 30 BMI ≥ 27 + 1 comorbidity

DM +

TFDA 適應症

用於體重控制，做為低熱量飲食及增加體能活動外之輔助療法

適用對象: 成人病人且初始身體質量指數(BMI)為： $\geq 30 \text{ kg/m}^2$ ，或 $\geq 27 \text{ kg/m}^2$ 至 $< 30 \text{ kg/m}^2$ ，且病人至少有一項體重相關共病症，例如第二型糖尿病、血脂異常或已獲控制之高血壓。



4

Semaglutide 2.4mg/wk (Wegovy®)

Semaglutide Treatment Effect in People with Obesity (STEP)¹



Mechanism of Action



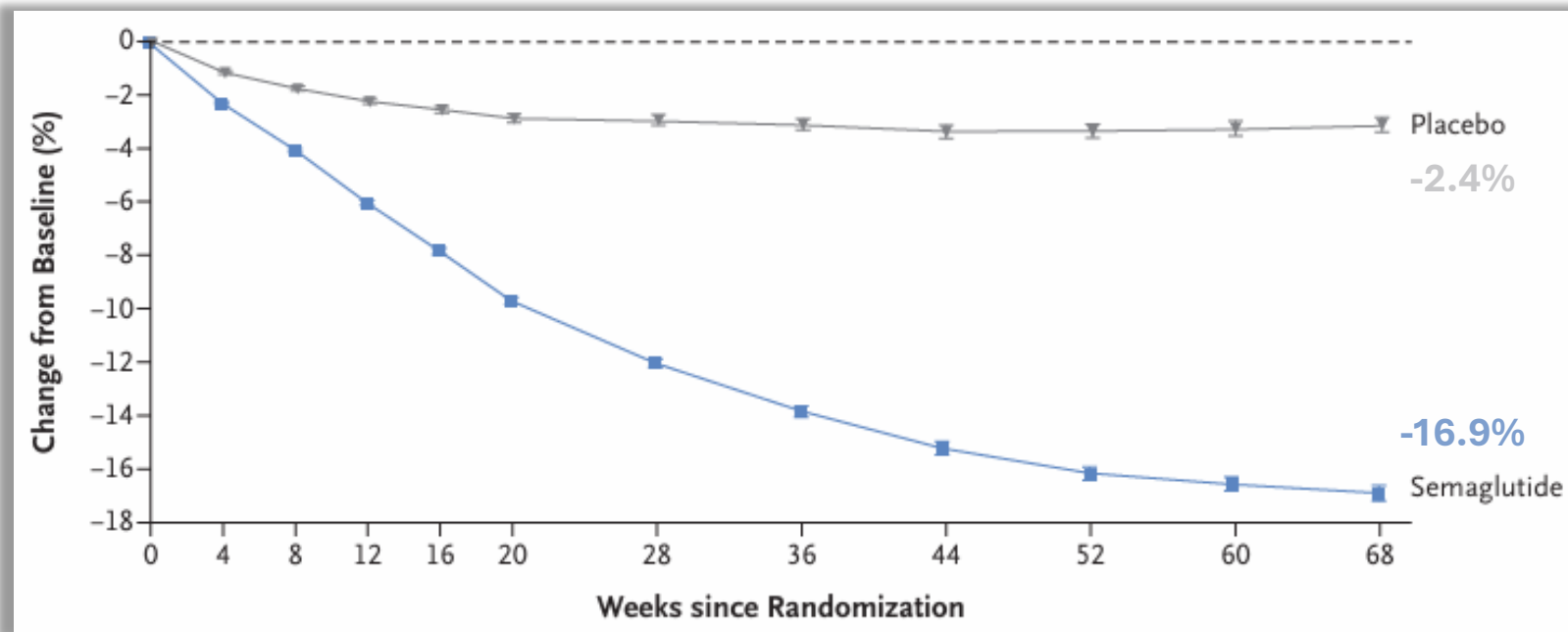
**Mean weight loss from
baseline**

•**Improved:** waist
circumference, blood
pressure, HbA1c, CVD events,
lipid profile

Additional benefits

1. N Engl J Med. 2021 Mar 18;384(11):989-1002. doi: 10.1056/NEJMoa2032183.

Semaglutide Treatment Effect in People with Obesity (STEP)¹



The change in body weight from baseline to week 68 was -15.3 kg **(-14.9%)** in semaglutide group as compared with -2.6 kg **(-2.4%)** in the placebo group

STEP 1 co-primary endpoint: Mean change in body weight (%) from week 0 to week 68

1. N Engl J Med. 2021 Mar 18;384(11):989-1002. doi: 10.1056/NEJMoa2032183.

TFDA 適應症

肥胖與過重之體重控制

- 1) 做為低熱量飲食及增加體能活動外之輔助療法，適用對象為成人病人且初始身體質量指數(BMI)為：
 - $\geq 30 \text{ kg/m}^2$ ，或
 - $\geq 27 \text{ kg/m}^2$ 至 $< 30 \text{ kg/m}^2$ ，且病人至少有一項體重相關共病症，例如血糖異常 (糖尿病前期或第二型糖尿病)、高血壓、血脂異常、阻塞性睡眠呼吸中止或心血管疾病。
- 2) 做為低熱量飲食及增加體能活動之輔助療法，適用對象為**12 歲以上的青少年**，合併
 - 肥胖* 以及
 - 體重超過 60 kg。
- 3) 用於**具有心血管疾病且身體質量指數(BMI) $\geq 27 \text{ kg/m}^2$** 的成人病人，降低發生重大心血管不良事件 (心血管疾病死亡、非致命心肌梗塞、非致命中風) 的風險。
- 4) 用於**正常收縮分率之心臟衰竭(HFpEF) 且 BMI $\geq 30 \text{ kg/m}^2$** 的成人病人，改善心臟衰竭症狀與其有關的身體日常活動限制，並降低心臟衰竭住院的風險。

5

Tirzepatide 15mg/wk (Mounjaro®)

SURMOUNT-1¹



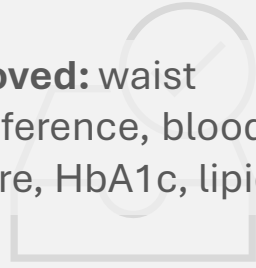
GIP and GLP-1 dual-hormone agonist

Mechanism of Action



Treatment:
22.9% at 72 wk

Mean weight loss from baseline



•Improved: waist circumference, blood pressure, HbA1c, lipid profile

Additional benefits

1. N Engl J Med. 2022 Jul 21;387(3):205-216. doi: 10.1056/NEJMoa2206038.

GLP-1 and GIP therapeutic efficacy¹



GIP activity*

↓ Reduced food intake

GLP-1 activity

↓ Reduced food intake

↑ Increased satiety



GIP activity*

↑ Increased insulin sensitivity

↑ Increased lipid-buffering capacity

↑ Increased storage capacity



GIP activity

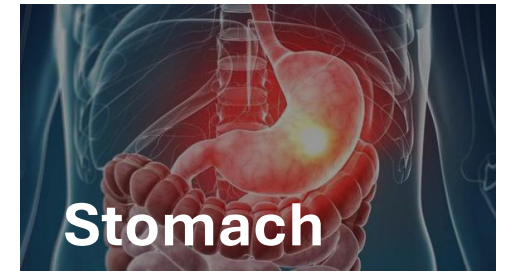
↑ Increased insulin

↑ Increased glucagon

GLP-1 activity

↑ Increased insulin

↓ Reduced glucagon



GLP-1 activity

↓ Reduced gastric emptying

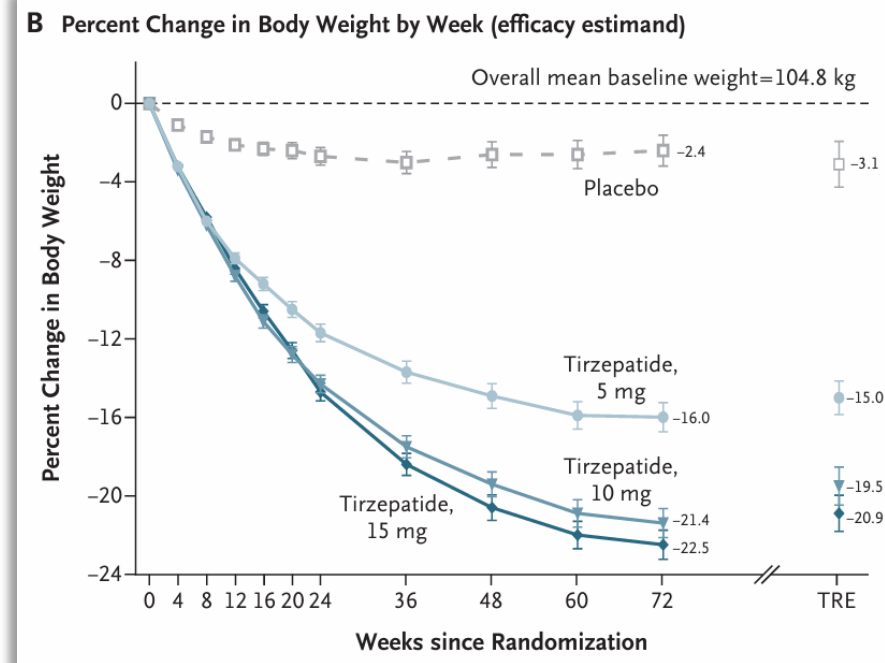
1. SammsRJ, et al. Trends Endocrinol Metab. 2020;31(6):410-421.

*Demonstrated in preclinical research.

The mean change in weight at week 72 with tirzepatide was **-16.0%** (-16.1kg), with the **5 mg** dose, and **-22.5%** (-23.6 kg) with the **15 mg** dose

BMI ≥ 30 BMI ≥ 27 + 1 comorbidity

DM -



TFDA 適應症

血糖控制

作為飲食及運動療法之外的輔助治療，用於改善第二型糖尿病成人病人之血糖控制。

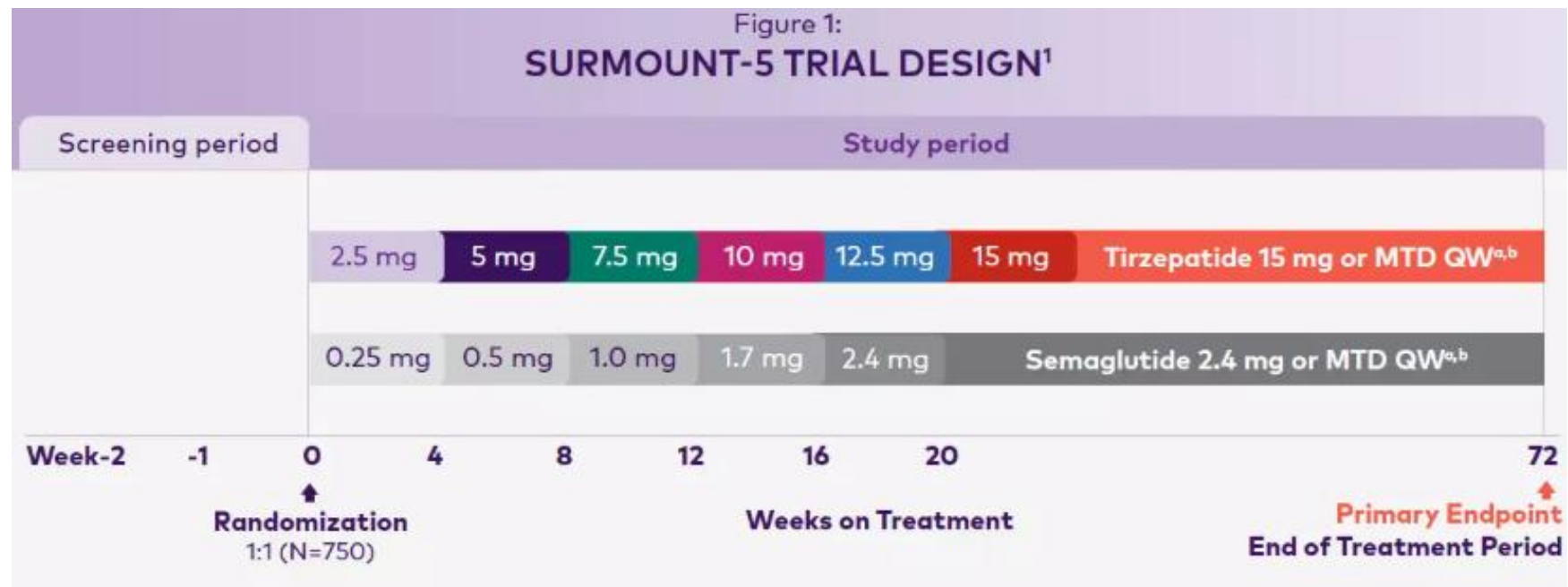
肥胖與過重之體重控制:

做為低熱量飲食及增加體能活動之輔助療法，適用對象為成人且初始身體質量指數(BMI)為

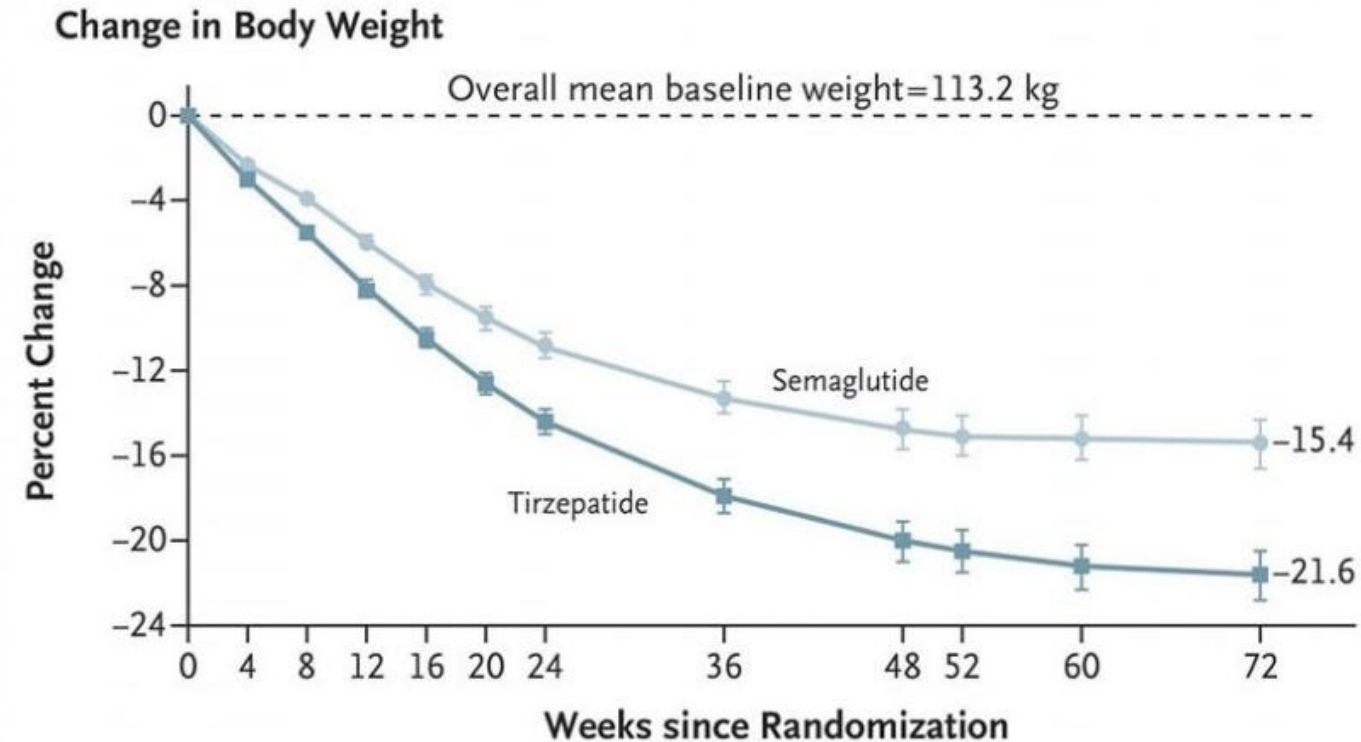
- 1) $\geq 30 \text{ kg/m}^2$ (肥胖)，或
- 2) $\geq 27 \text{ kg/m}^2$ 至 $< 30 \text{ kg/m}^2$ (過重)且至少患有一項體重相關共病，例如高血壓、血脂異常、糖尿病前期或第二型糖尿病、阻塞性睡眠呼吸中止或心血管疾病。

Mounjaro® vs. Wegovy® in obesity (non-DM) population (H2H)

SURMOUNT-5¹



1. N Engl J Med. 2025 Jul 3;393(1):26-36. doi: 10.1056/NEJMoa2416394.



Body weight change*

-15.4 %

(Semaglutide 1.7/2.4mg)

Body weight change*

-21.6 %

(Tirzepatide 5/10mg)

■ Tirzepatide (10 or 15mg) (n=374) ■ Semaglutide (1.7 or 2.4mg) (n=376)

* least-squares mean percent change in body weight from baseline to week 72

Future treatments of obesity

Est. release 2026 - 2027

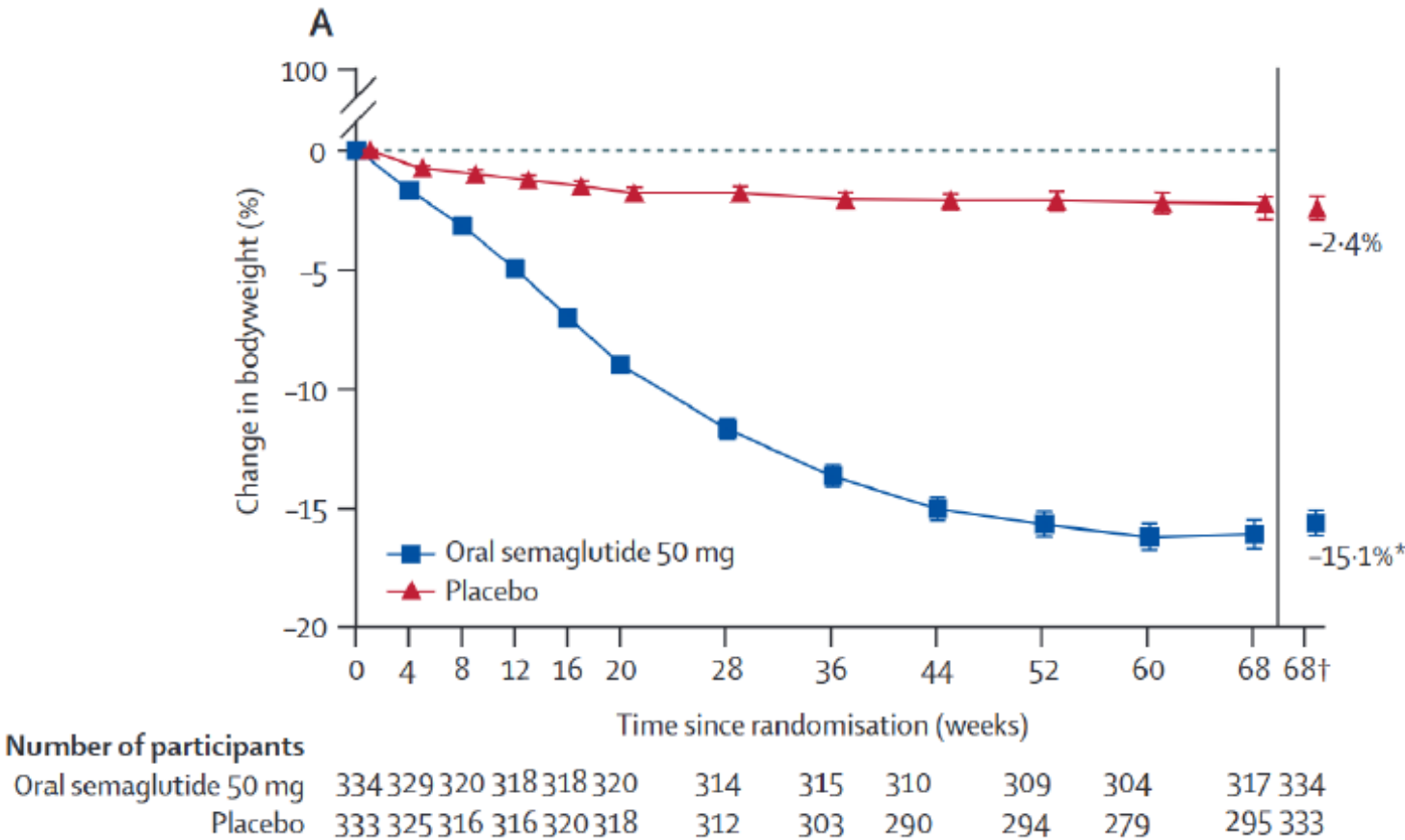


Oral GLP-1 agonist

15.1% in 68 weeks

Oral semaglutide 50 mg taken once per day in adults with overweight or obesity (OASIS 1)

a randomised, double-blind, placebo-controlled, phase 3 trial



Lancet. 2023 Aug 26;402(10403):705-719. doi: 10.1016/S0140-6736(23)01185-6.

Oral GLP-1 agonist

1. Proc Natl Acad Sci U S A. 2020 Nov 24;117(47):29959-29967. doi: 10.1073/pnas.2014879117.
2. Diabetes Ther. 2024 Apr;15(4):819-832. doi: 10.1007/s13300-024-01554-1.
3. Clin Pharmacol Drug Dev. 2025 Sep 1. doi: 10.1002/cpdd.1594.

Orforglipron - A Novel, Biased, Non-peptide, Oral GLP-1 RA

Novel

- Small molecule¹
- Non-peptide GLP-1 RA¹

Biased

- Partial GLP-1 RA biased towards cAMP pathway vs. β -arrestin recruitment at the GLP-1 receptor¹

Oral

- Daily oral administration^{1,2}
- 1mg oral capsule showed a genomic absolute bioavailability of 77%³
- Terminal half-life is 47.7 hours³

Oral GLP-1 agonist

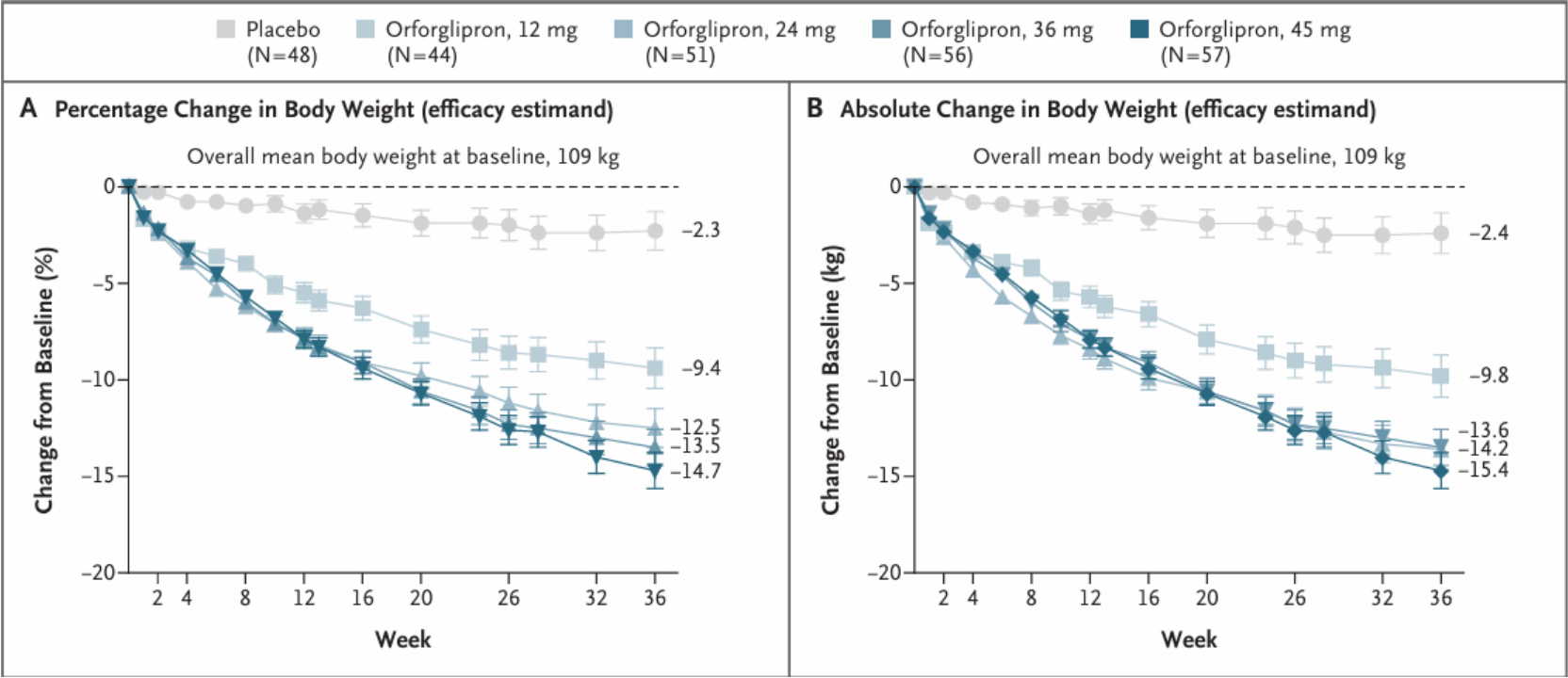
-9.4 ~ 14.7% in
36 weeks

1. N Engl J Med. 2023 Sep 7;389(10):877-888. doi: 10.1056/NEJMoa2302392.

Change in body weight from baseline to week 36 (Efficacy estimated)

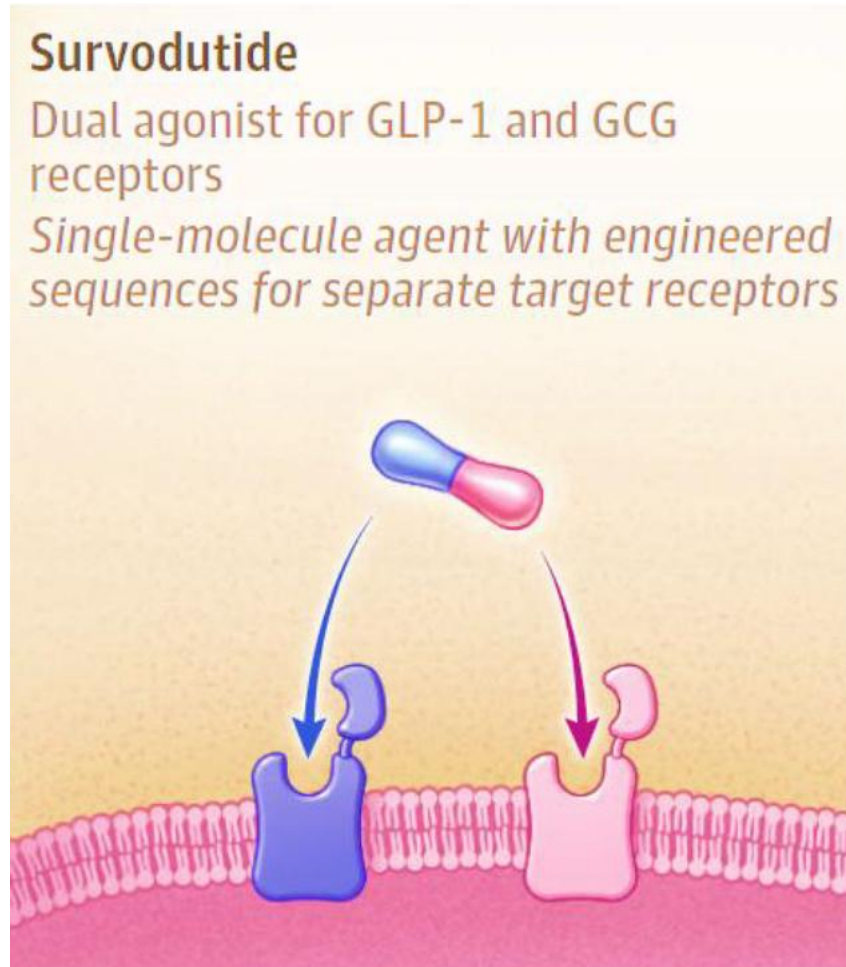
Phase 2 study of Orforglipron in Adults with obesity

Overall mean body weight at baseline = 109kg



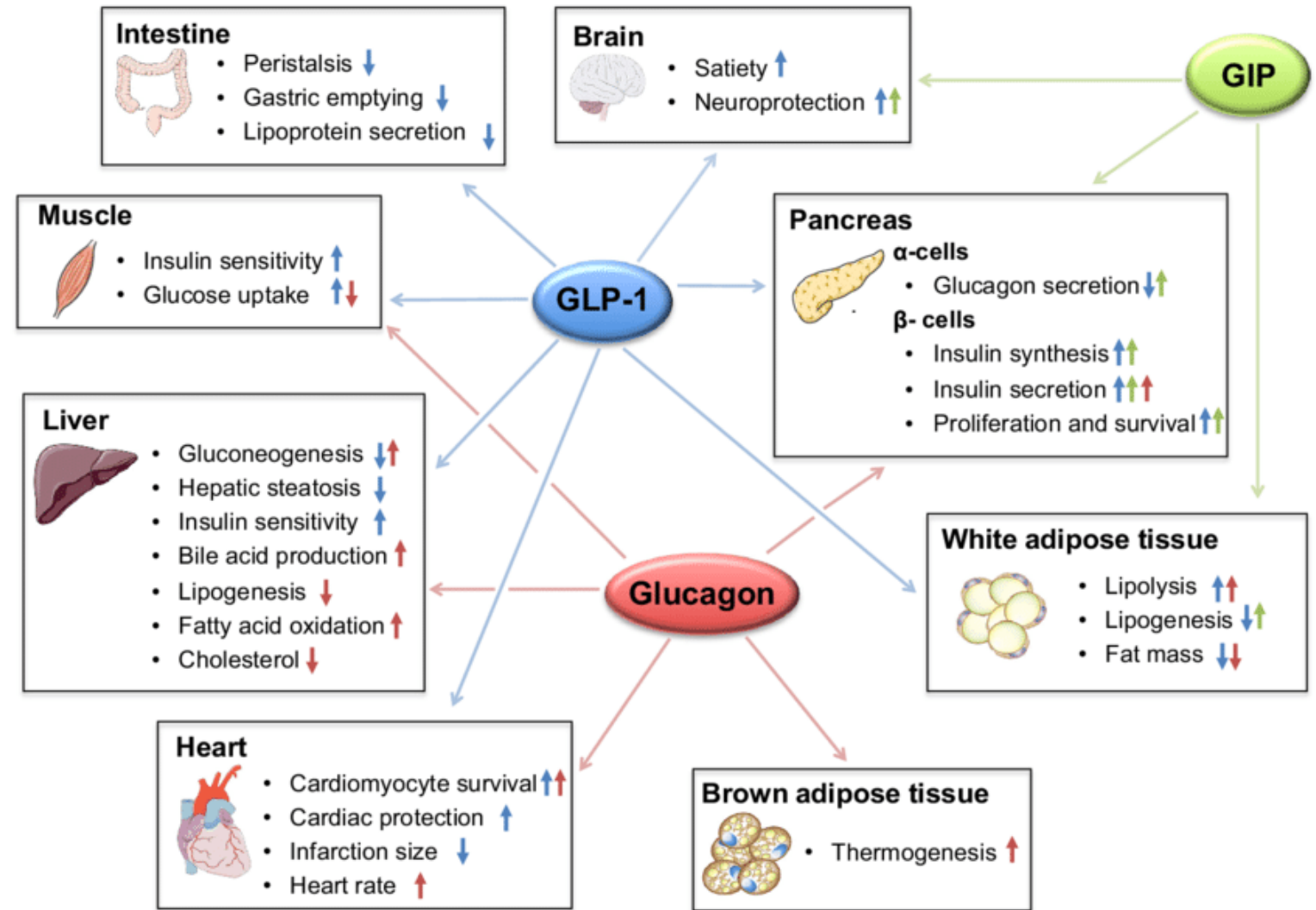
Glucagon/ GLP-1 agonist

1. JAMA. 2025 Oct 14;334(14):1231-1234.
doi: 10.1001/jama.2025.14392.



Glucagon affects more in liver and fat burning

1. J Intern Med. 2018 Dec;284(6):581-602.
doi: 10.1111/joim.12837.

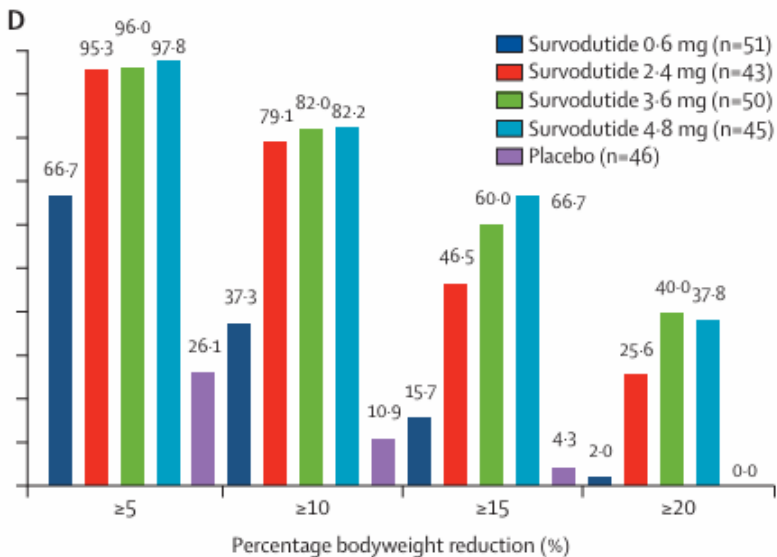
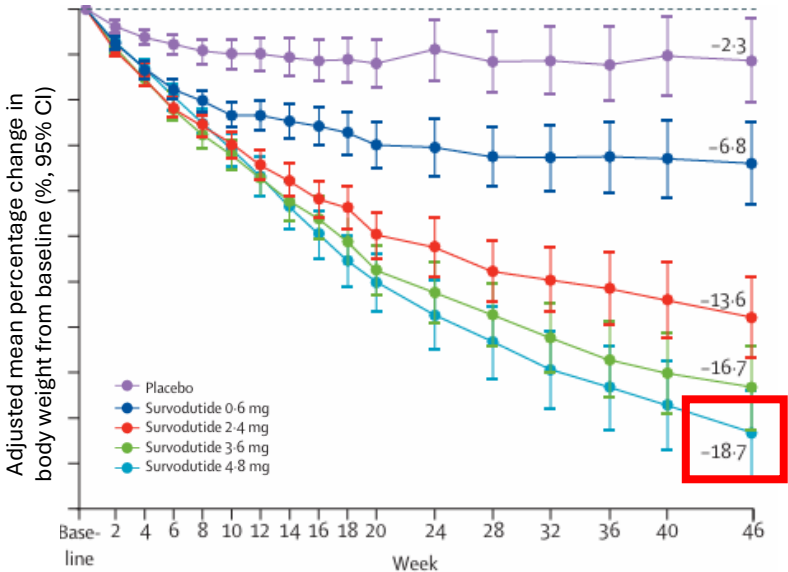


Survodutide - GLP-1 + glucagon (8:1)

phase 2 - obesity

-15-19% in 46 weeks

1. Lancet Diabetes Endocrinol. 2024
Mar;12(3):162-173. doi: 10.1016/S2213-
8587(23)00356-X.

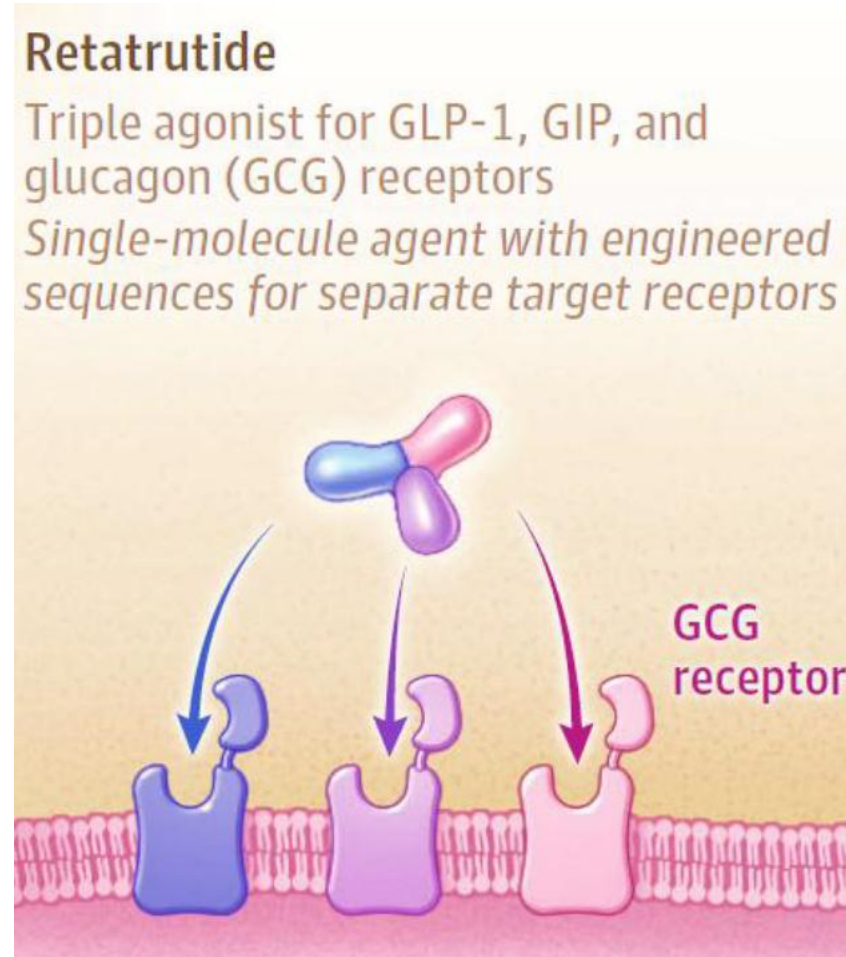


CVD risk factors	Change from baseline	
	Survodutide	Placebo
SBP (mmHg)	-6.2 ~ -8.7	-2.5
DBP (mmHg)	-3.3 ~ -4.8	-1.9
Total cholesterol	+0.8% ~ -9.0%	+1.2%
Triglycerides	-16.7% ~ 27.7%	+5.7%
LDL-cholesterol	+6.8% ~ -8.9%	+1.7%

Safety parameters	Change from baseline	
	Survodutide	Placebo
SAEs (%)	1~8%	7%
Discontinuation due to AEs	20~29%	4%
Nausea (%)	34~65%	20%
Vomiting (%)	9~35%	5%
Diarrhea (%)	18~28%	10%

Glucagon/ GIP/GLP-1 agonist

1. JAMA. 2025 Oct 14;334(14):1231-1234.
doi: 10.1001/jama.2025.14392.



Retatrutide

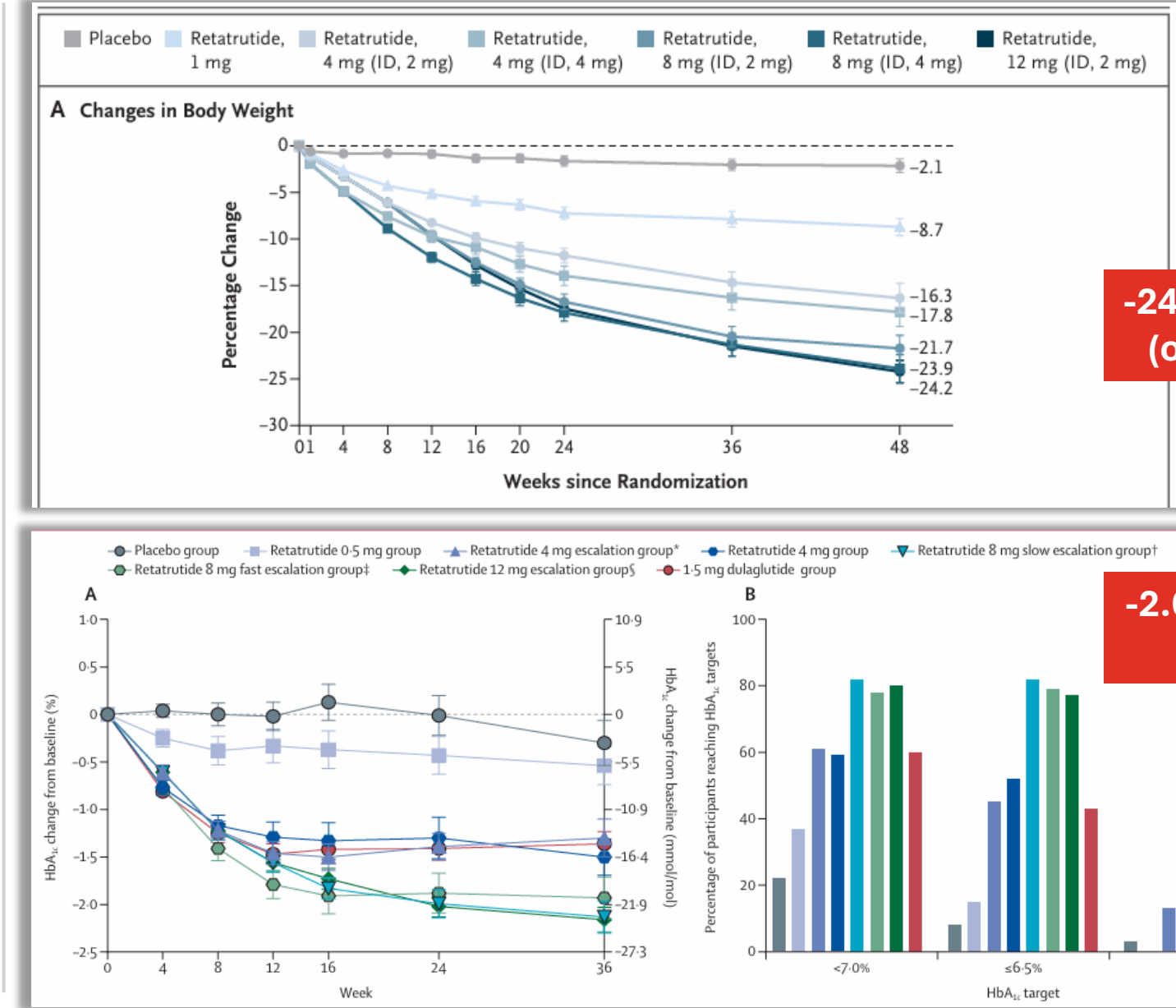
- GLP-1/GIP/Glucagon

phase 2 study for
obesity/diabetes

-24.4% in 48 weeks

1. N Engl J Med. 2023 Aug 10;389(6):514-526.
doi: 10.1056/NEJMoa2301972.

2. Lancet. 2023 Aug 12;402(10401):529-544.
doi: 10.1016/S0140-6736(23)01053-X.



-24.4% BW¹
(obesity)

-2.0% HbA_{1c}²
(DM)

Amylin agonists

1. Pharmacol Rev. 2015 Jul;67(3):564-600.
doi: 10.1124/pr.115.010629.

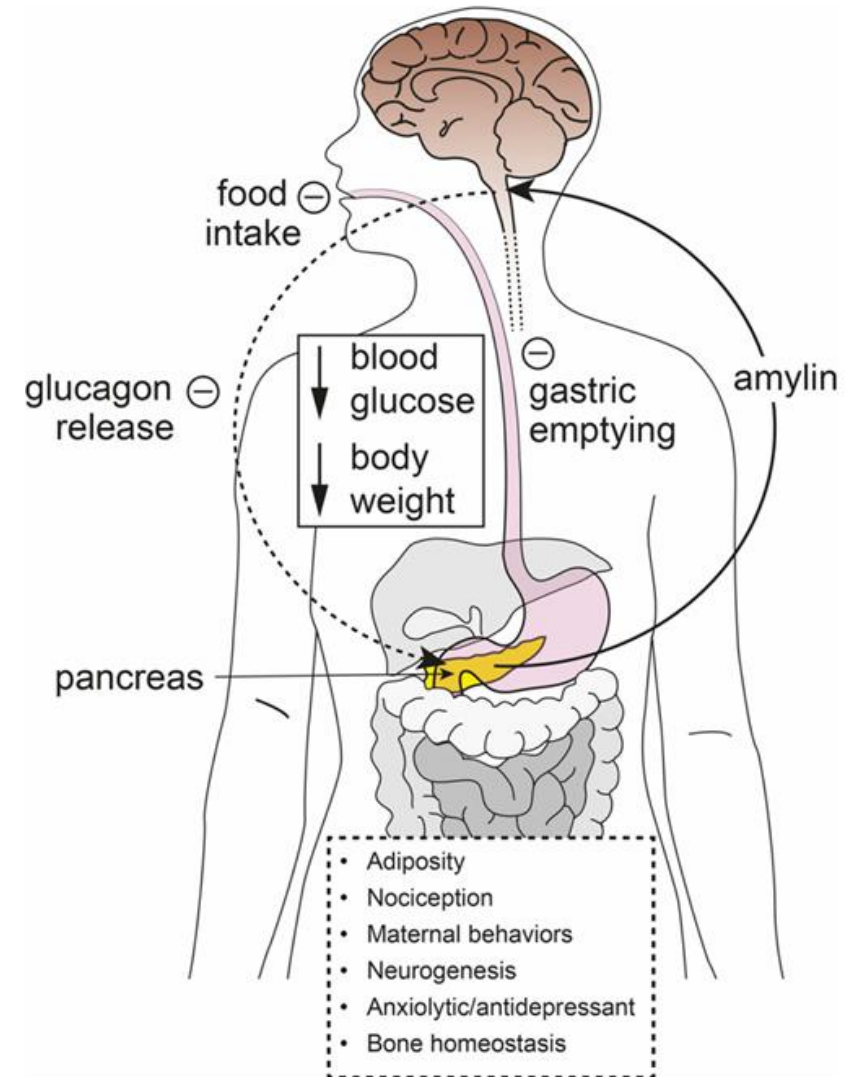
AMYLIN EFFECTS¹

Peptide hormone

- Co-secretion with insulin

Midbrain action

- Reduce eating
- Slow gastric emptying
- Inhibit glucagon secretion (**rat**)



Cagrisema

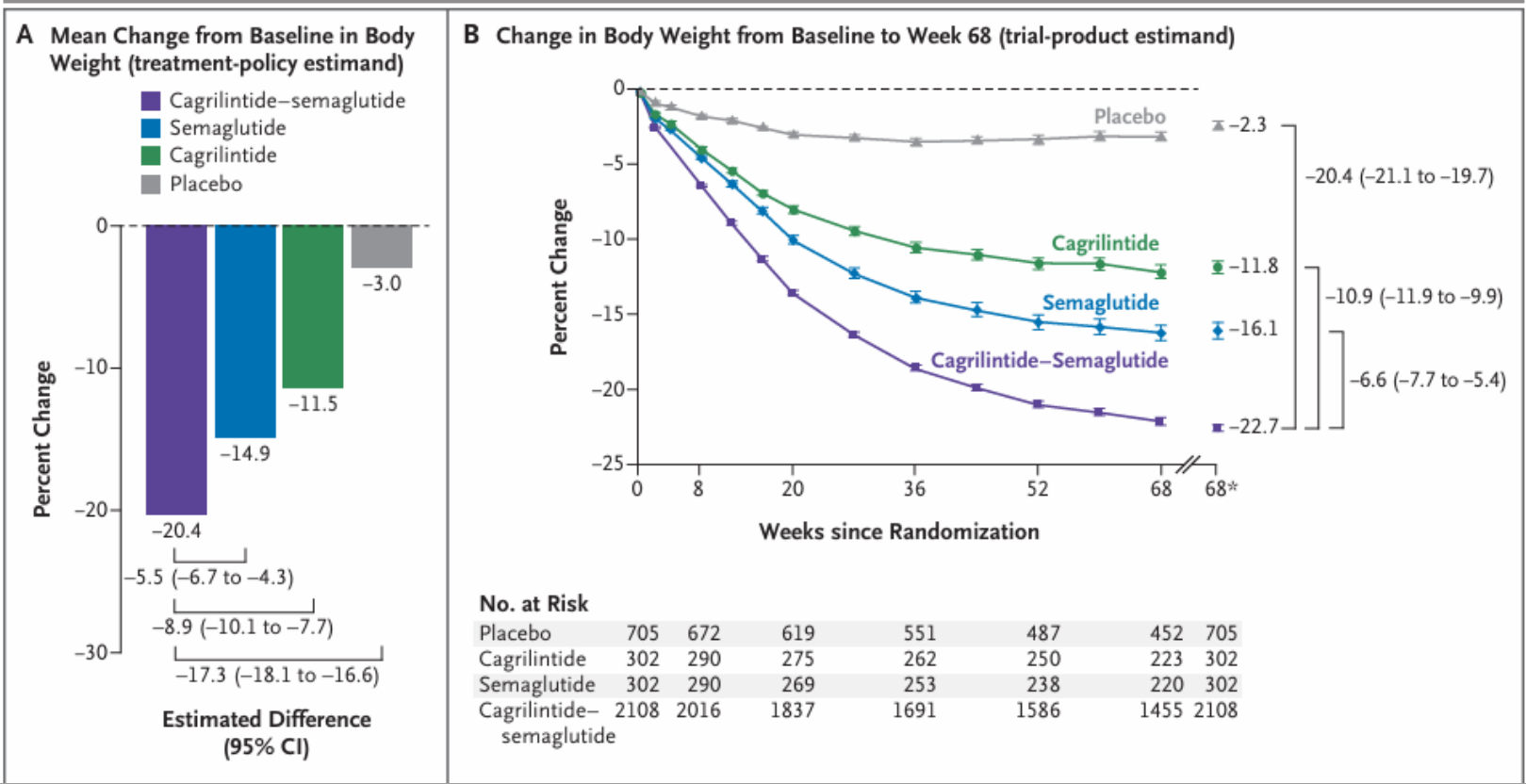
- Cagrilintide +
Semaglutide

-22.7% in 68 weeks

1. N Engl J Med. 2025 Aug 14;393(7):635-647. doi: 10.1056/NEJMoa2502081.

Participants treated with Cagrisema 2.4mg/2.4mg achieved weight reduction up to 22.7%

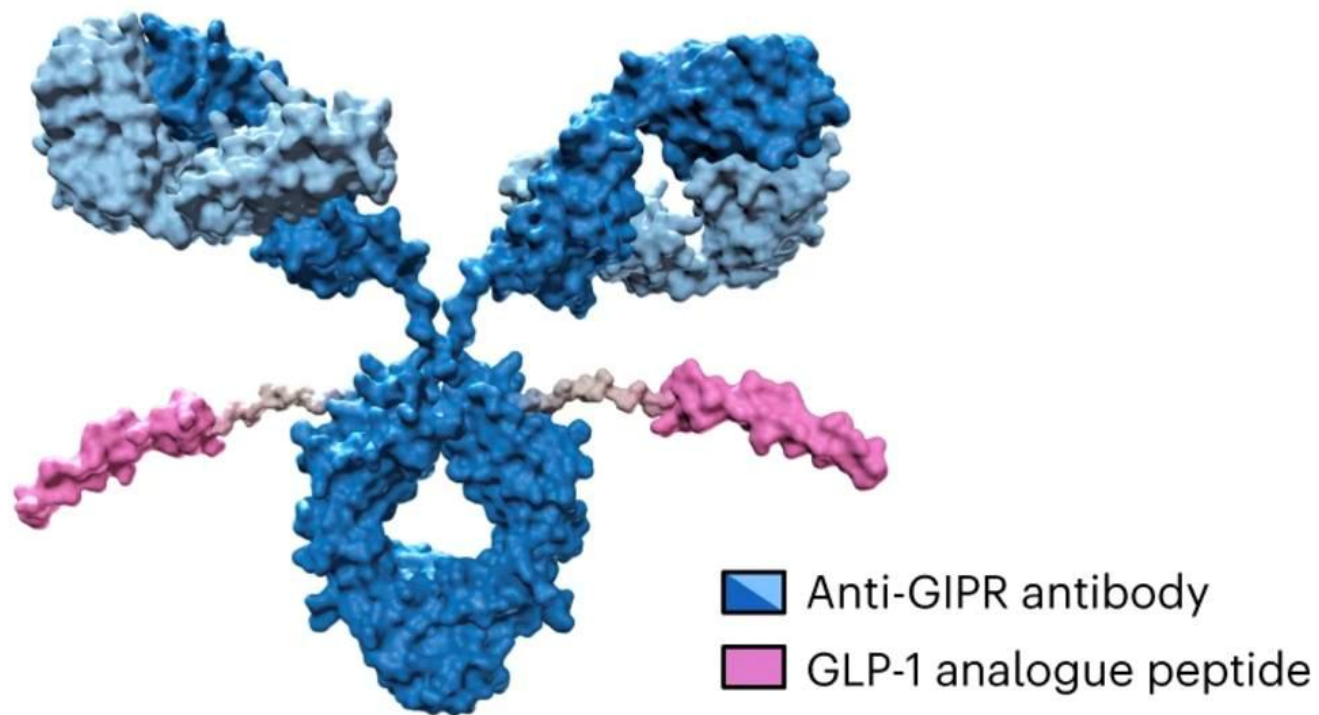
REDEFINE 1 study



GIP **ant**agonist /GLP-1 agonist

Maridebart cafraglutide (Maritide): An anti-GIPR antibody conjugated to two GLP-1 analog peptides¹

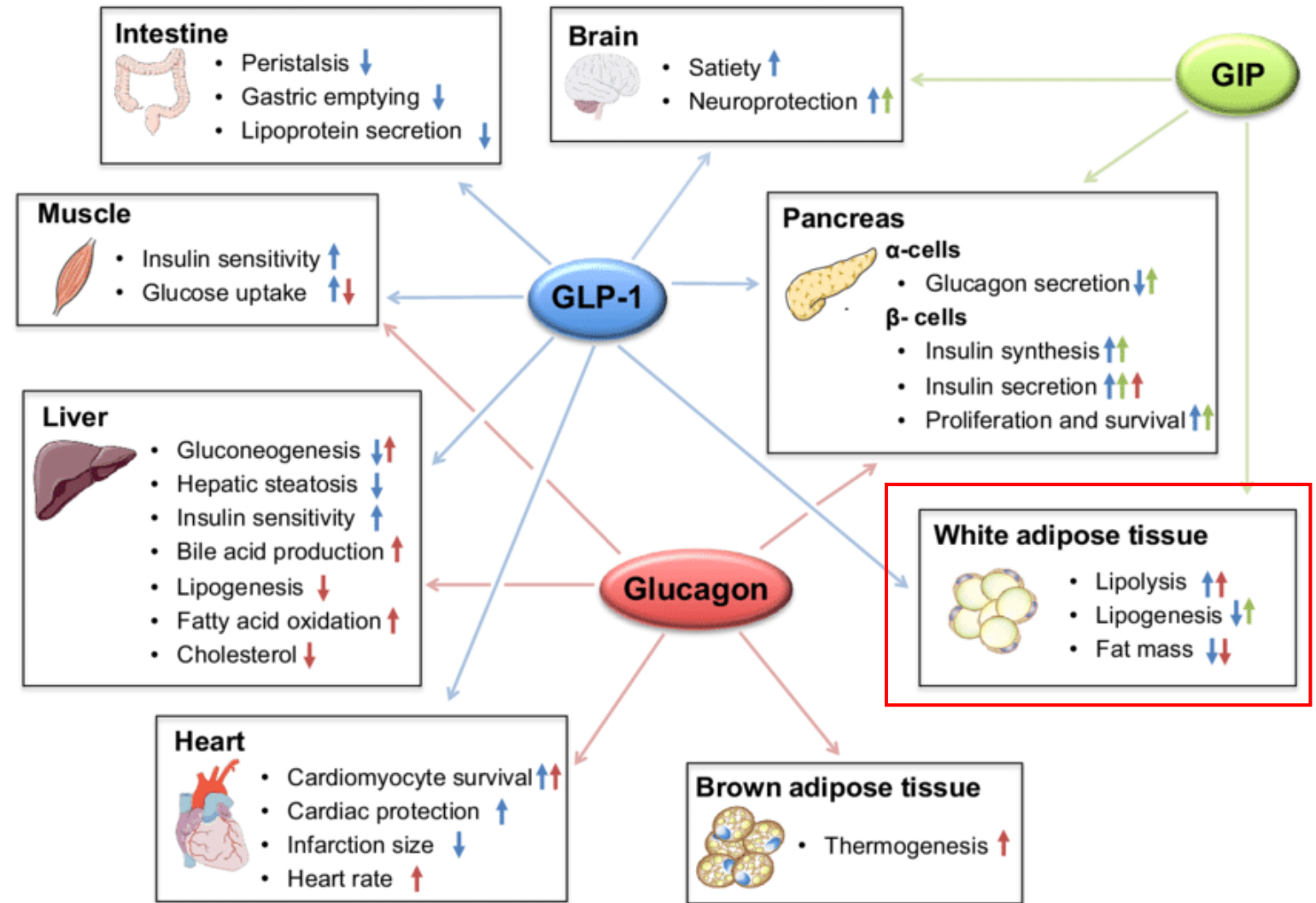
a



1. Nat Metab. 2024 Feb;6(2):290-303. doi: 10.1038/s42255-023-00966-w.

GLP agonist protect brain, but **antagonist** reduce fat

1. J Intern Med. 2018 Dec;284(6):581-602.
doi: 10.1111/joim.12837.



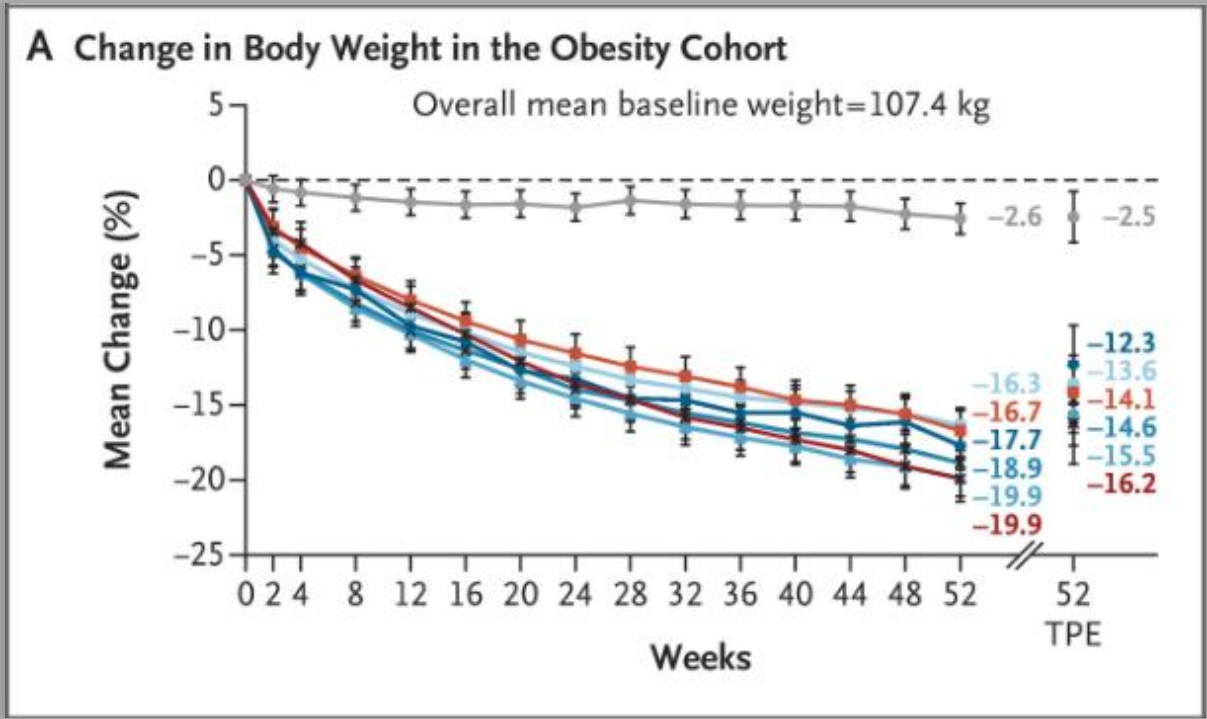
GIP antagonist /GLP-1 agonist

-20% in 52 weeks

DE = dose escalation

- 1. Nat Metab. 2024 Feb;6(2):290-303. doi: 10.1038/s42255-023-00966-w.

Average weight reduction was up to nearly 20%
with 52 weeks of **monthly** MariTide



140 mg every 4 wk (no DE) 280 mg every 4 wk (no DE) 420 mg every 4 wk (no DE) 420 mg every 8 wk (no DE)
420 mg every 4 wk, with 4-wk DE 420 mg every 4 wk, with 12-wk DE Placebo

Other new-comers

Expected in 2027~

1. JAMA Netw Open. 2021 Jan 4;4(1):e2033457. doi: 10.1001/jamanetworkopen.2020.33457.

2. Lancet Diabetes Endocrinol. 2025 Nov;13(11):911-923. doi: 10.1016/S2213-8587(25)00216-5.

3. Aging Clin Exp Res. 2024;36(1):185. Published 2024 Sep 9. doi:10.1007/s40520-024-02825-4



Bimagrumab¹



Monlunabant²

Drug type	activin receptor type-2B (monoclonal Ab)	cannabinoid receptor 1 (CB1R) inverse agonist
Key feature	Promote muscle hypertrophy ³ (inhibit muscle atrophy ligand)	minimising neuropsychiatric risks (no CNS penetration)
Inclusion character	BMI > 30 BMI > 27 + DM	BMI > 30 Metabolic syndrome



1. Int J Obes (Lond). 2025 Mar;49(3):433-451. doi: 10.1038/s41366-024-01473-y.



1. Int J Obes (Lond). 2025 Mar;49(3):433-451. doi: 10.1038/s41366-024-01473-y.

* 特別感謝糖尿病學會秘書長嚴愛文醫師 *

肥胖與醣類以及脂肪堆積相關；比起體重，異位脂肪導致後果更嚴重

GLP-1, GIP/GLP-1 agonist可帶來顯著且持久的體重減輕

藥物與生活型態、運動以及行為治療應該並行

未來口服GLP-1以及每月施打等新世代藥物有望改變臨床治療型態

TAKE HOME MESSAGE