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KNOWLEDGE FOR POLICY

Health Promotion and Disease Prevention Knowledge Gateway

A reference point for public health policy makers with reliable, independent and up-to date information on topics related to promotion of health and well-being.

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Obesity prevention

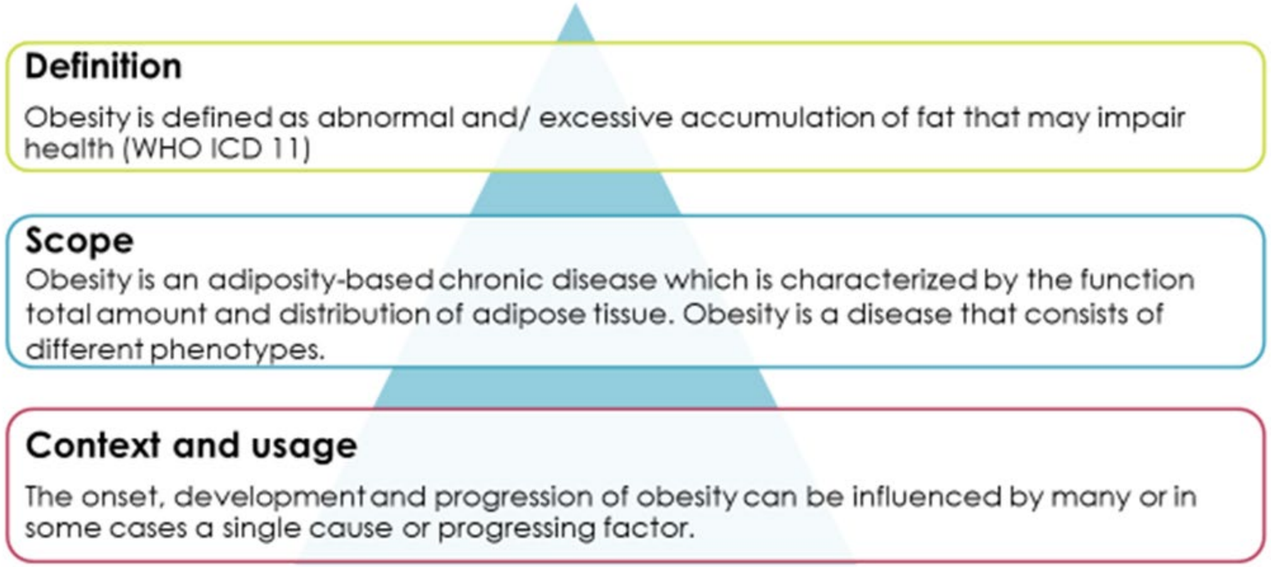
Obesity is a chronic relapsing disease, which in turn acts as a gateway to a range of other non-communicable diseases, such as diabetes, cardiovascular diseases and cancer.

ABOUT EASO

EASO is a federation of 37 National Obesity Associations and **180 specialist multidisciplinary treatment centres**. It is the voice of European obesity professionals, representing a community of over **20,000** scientists, academics, health care practitioners, physicians, public health experts, early career researchers and students.

EASO convenes experts from all areas of obesity to undertake actions in research, education and policy.

ABOUT OBESITY



SOURCE: Bowman-Busato, J., Schreurs, L., Halford, J.C.G. *et al.* Providing a common language for obesity: the European Association for the Study of Obesity obesity taxonomy. *Int J Obes* (2024). https://doi.org/10.1038/s41366-024-01565-9

Obesity in the WHO European Region: 2022 Report

- Overweight and obesity are among the leading causes of disability and death in the WHO European Region
- In Europe, obesity is the highest risk factor for disability
- For some countries, obesity might overtake smoking as the main risk factor for cancer in the coming decades

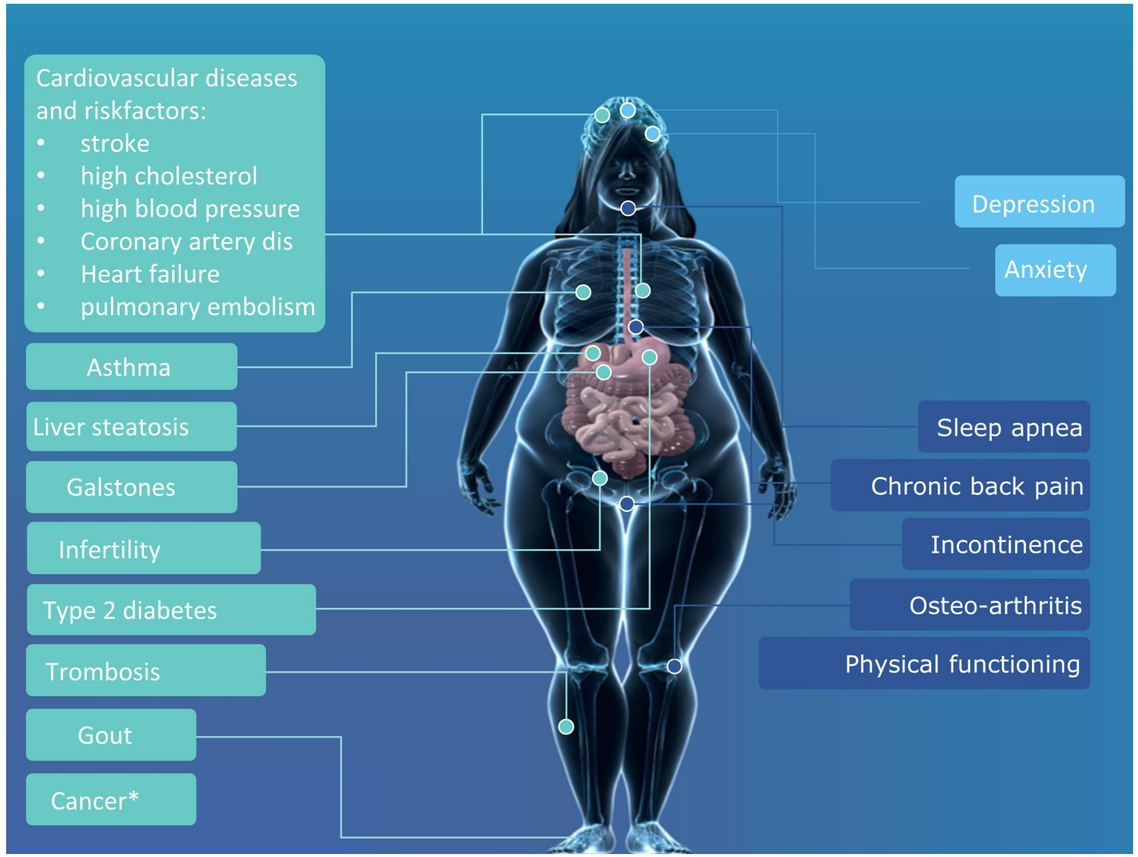
EASO
European Association for the Study of Obesity

www.easo.org

ABOUT OBESITY

Obesity is a Gateway Disease: Leading to >200 other diseases

Metabolic | Mechanical | Mental



*Includes breast, colon, endometrial, esophageal, kidney, ovarian, pancreatic and prostate cancer

>80% of People with Obesity develop T2D.

At the individual level, an investigation of medical signs and symptoms of obesity includes more than just measuring weight or BMI

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ABOUT OBESITY - ETIOLOGY

SIX main categories of biological triggers for the onset or progression of obesity (malfunctioning adipose tissue)

COMMON

- Hormonal
- Medication
- Lifestyle
- Psychosocial

RARE

- Hypothalamic
- Monogenic / syndromic

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ABOUT OBESITY - ETIOLOGY

Hormonal

Common

Hypothyroidism

PCOS

Hypogonadism

Postpartum weigl retention

Menopause

Rare

Hypopituitarism

(Cyclic) Cushing's syndrome

Growth hormone deficiency

Medication

Common

Corticosteroids: topica local, oral, injections

Antihypertensives: β-blockers, α-blockers

Antidepressants: mirtazapin, citalopram paroxetin

Antipsychotics: olanzapin, risperidon, lithium

Pain medication: pregabalin, amitryptilir

Diabetes medication: insulin, glimepiride

Lifestyle

Common

Unhealthy diet or crash (yoyo) diets

Sedentary lifestyle

Chronic lack of sleep

OSA

Shift work

Timing of meals

Alcohol/smoki ng

Psychosocial

Common

Depression

Chronic stress

Child abuse (physical or emotional)

History of sexual abuse

Psychotrauma

Eating disorders e.g., binge-eating disorder, bulimia nervosa

Socioeconomic and cultural factors

Hypothalamic

Rare

Hypothalamic lesion after radiotherapy, surgery or trauma

Hypothalamic tumor

Craniopharyngeoma

Malformation

Monogenic / syndromic

Rare

Monogenic obesity characterized by:
Early-onset obesity
Increased appetite
Striking weight difference with family members

Examples:
Deficiencies in MC4R, POMC, leptin (leptin-receptor), PCSK1

Rare

Syndromic obesity characterized by:
Early-onset obesity
Increased appetite
Striking weight difference with family members
Dysmorphic characteristics congenital abnormalities
Development delay

Examples:
Prader-Willi, Bardet-Biedl, 16p11.2 deletion, Alström syndr

Van der Valk, et al. Obes Rev 2019

OSA, obstructive sleep apnea; PCOS, polycystic ovary syndrome

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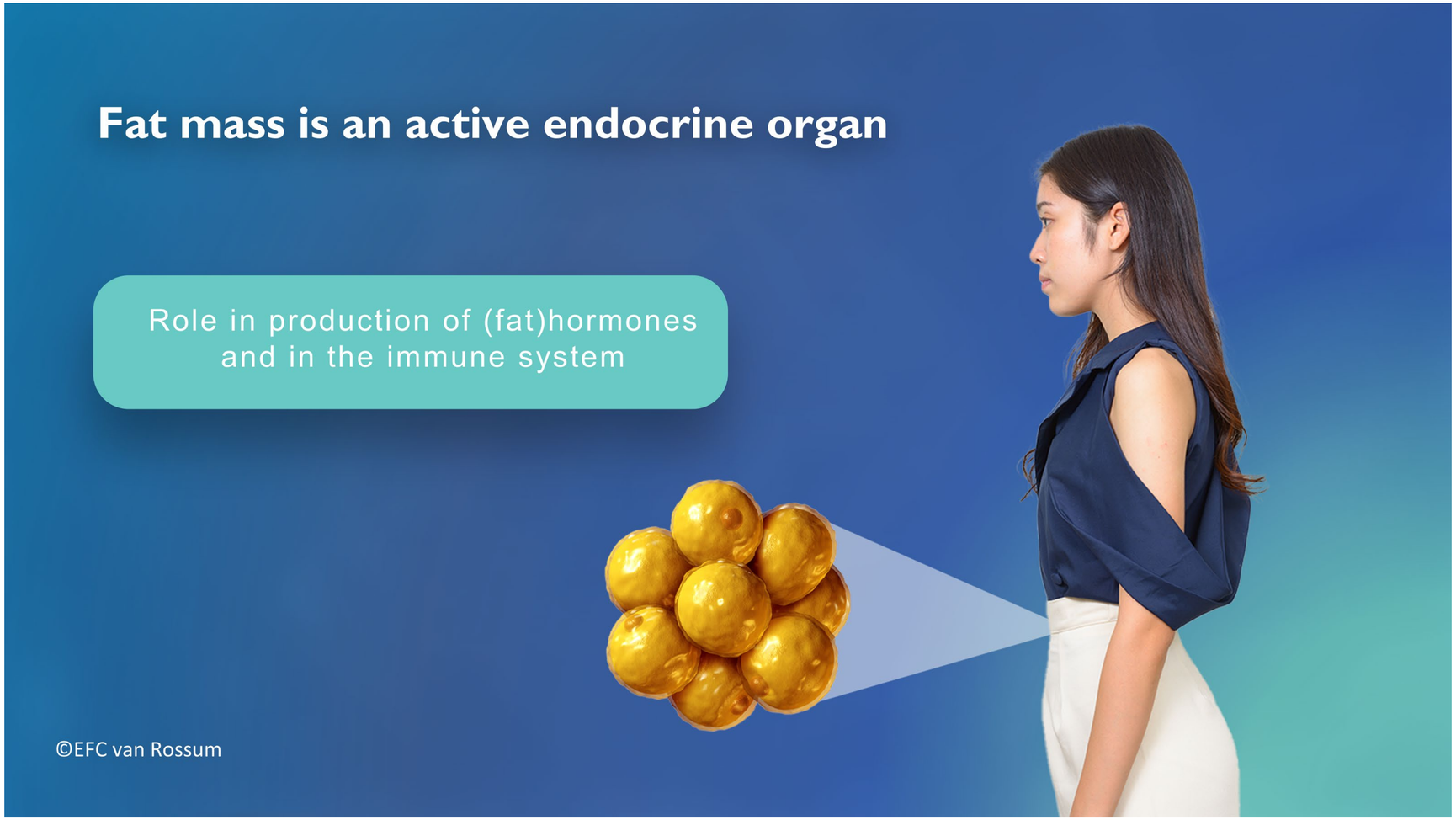
ABOUT OBESITY



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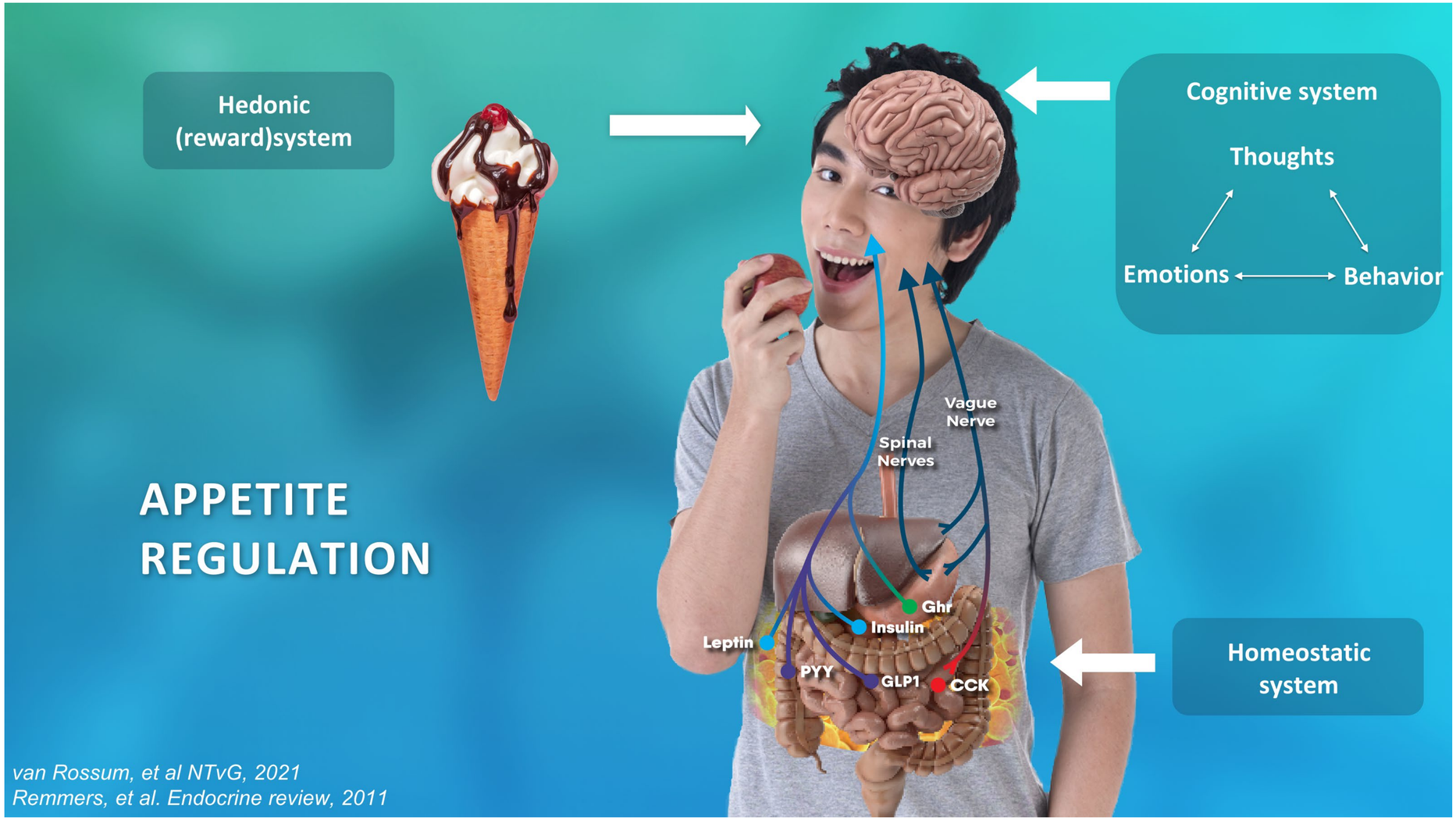
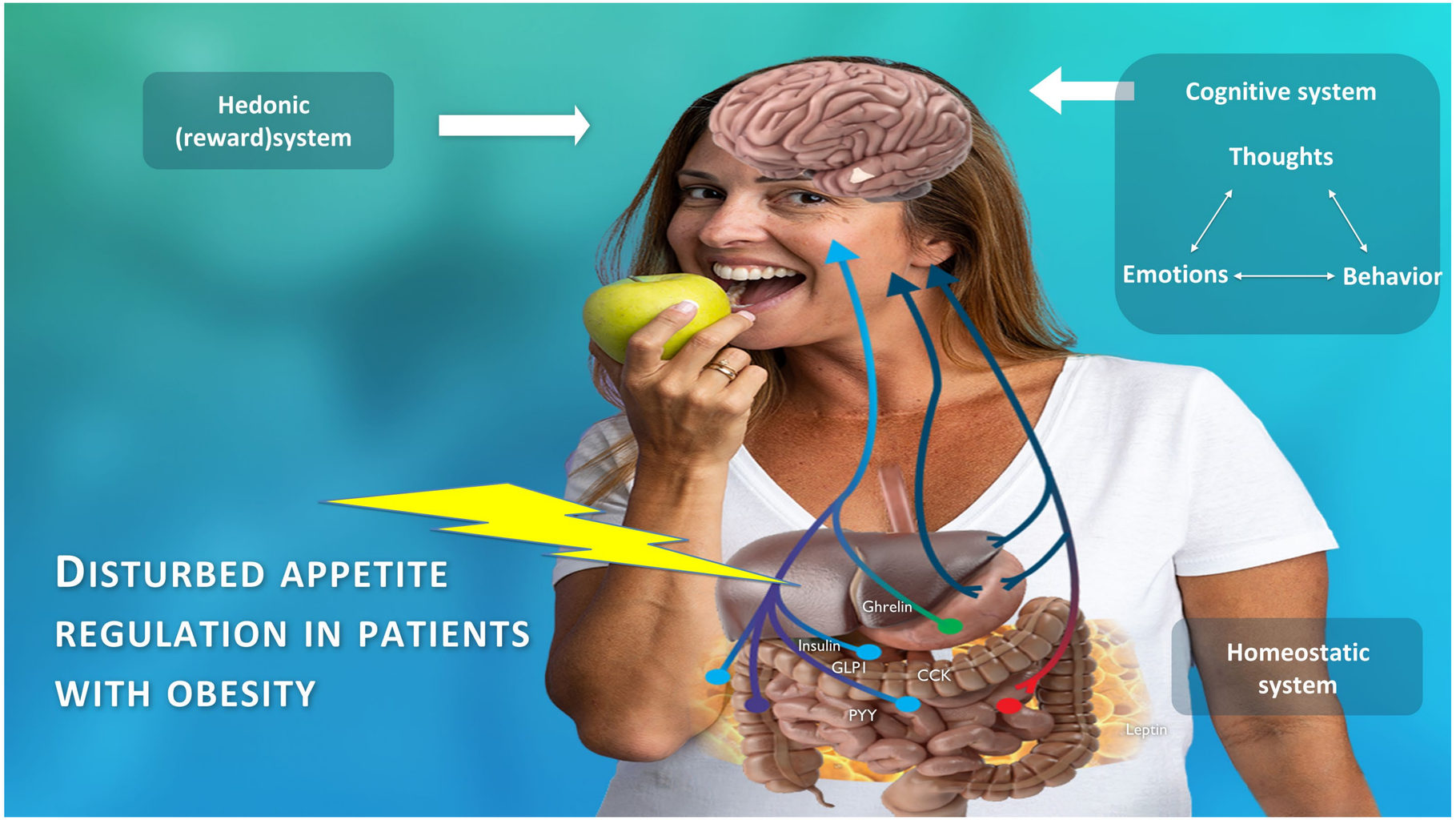


van Rossum, et al NTvG, 2021
Remmers, et al. Endocrine review, 2011

ABOUT OBESITY



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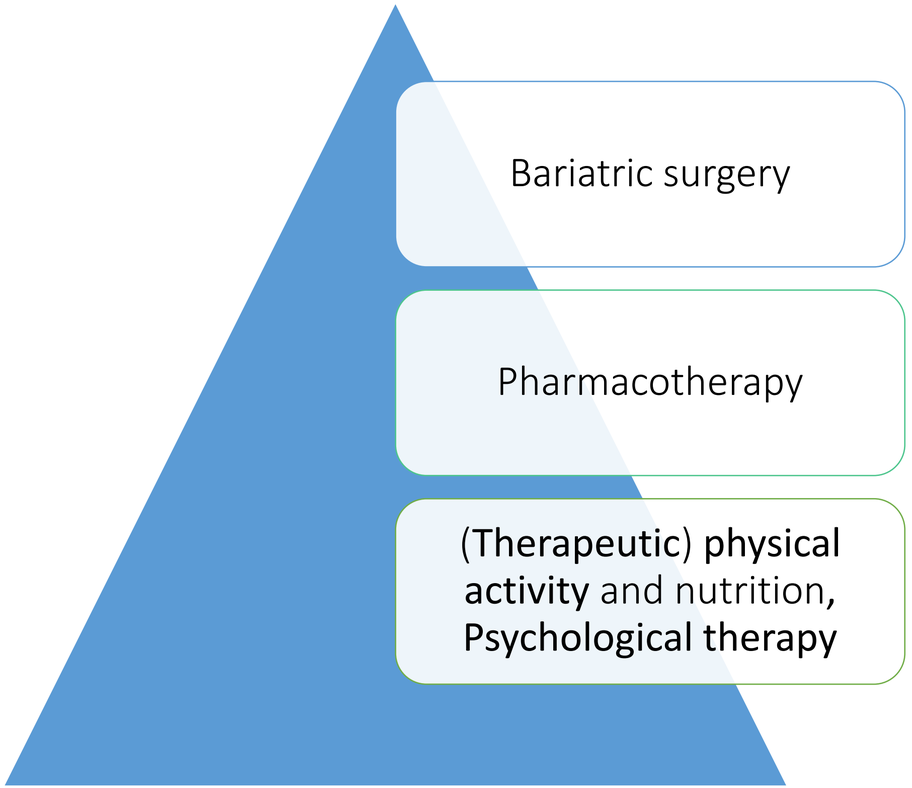
OBESITY TREATMENT & LONG-TERM MANAGEMENT



By approaching obesity in the same way as other non-communicable diseases, we could prevent over 230 complications of obesity and specifically other major NCDs[2], including up to:

80% of type 2 diabetes

35% of ischaemic heart disease

55% of hypertensive disease among adults

20% of adult cancers - including cancers of the colon, rectum, breast, endometrium, liver, kidney

In order to achieve the best possible outcomes for people living with pre-obesity and obesity we must work together to look past primary prevention, and instead consider the knock-on effects that good management and treatment could have for those currently living with obesity and prevention of complications.

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OBESITY and T2D MEDICATIONS with weight reducing effects

Indicated for Obesity

Medication	Brand name	EMA approval	Type of medication	Availability June 2024
Naltrexon/Bupropion	Mysimba	yes	Tablet	Good
Liraglutide 3 mg	Saxenda	Yes	Injection	Good /limited
Semaglutide 2.4 mg	Wegovy	Yes	Injection	Limited
Tirzepatide	Mounjaro	Yes	Injection	Limited
Orlistat	Alli/Xenical	Yes	Tablet	Good

Indicated for Type 2 Diabetes

Liraglutide 1.8 mg	Victoza	Yes	Injection	Good
Semaglutide 1 mg	Ozempic	Yes	Injection	Limited
Semaglutide 14 mg	Rybelsus	Yes	Tablet	Good
Tirzepatide	Mounjaro	Yes	Injection	Limited
Metformin	Metformin	Yes	Tablet	Good
Other GLP-1 analogues		Yes		
SGLT2 inhibitors		Yes		
DPP4 inhibitors		Yes		

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SGLT2 inhibitors		Yes		
DPP4 inhibitors		Yes		

OBESITY MEDICATIONS

Anti-obesity medication in obesity-related complications and comorbidities Clinical trials of registered drugs

Published, positive results
Not yet published but positive results
Ongoing, completion date
Completed, first presentation
Published, neutral results
Solid border: phase 3 double-blind RCT
Dashed border 1: phase 2 and/or small RCT
Dashed border 2: small open-label (pilot) study

Obesity Overview

Obesity
- Liraglutide 3.0mg[1]
- Naltrexone/Bupropion[2]
- Semaglutide 2.4mg[3]
- Tirzepatide[4]

Food cravings in Obesity
- Liraglutide 3.0mg[5,6]
- Naltrexone/Bupropion[7]
- Semaglutide 2.4mg[8]

T2D + Obesity
- Liraglutide 3.0mg[9]
- Naltrexone/Bupropion[10]
- Semaglutide 2.4mg[11]
- Tirzepatide[12]

Prediabetes + Obesity
- Liraglutide 3.0mg[27]
- Semaglutide 2.4mg[28], ECO 2024 May 14

CVD + Obesity (CVOT)
- Liraglutide 1.8mg in T2D[13]
- Semaglutide 1.0mg in T2D[14]
- Semaglutide oral 14 in T2D[15]
- Semaglutide oral 14 in T2D, July 2024[16]
- Semaglutide 2.4mg[17]
- Tirzepatide, Oct 2027[18]
- Tirzepatide T2D, Oct 2024[19]

HFpEF + Obesity
- Semaglutide 2.4mg[20]
- Semaglutide 2.4mg in T2D, [21,49]
- Tirzepatide, July 2024[22]

CKD + Obesity
- Semaglutide 1.0mg in T2D24,[25], NEJM May 2024
- Semaglutide 2.4, Oct 2024[26]
- Tirzepatide phase 2, Feb 26[43]

MASH + Obesity
- Semaglutide 2.4, Oct 24[23]
- Liraglutide 1.8, small RCT[39]
- Semagluti 0.4 daily, phase 2[40]
- Tirzepatide phase 2[41,42], EASL 2024 June 5-8

PCOS + Obesity
- Liraglutide 3., small RCT[45,46]

Quality of Life in Obesity
- Liraglutide 3.0mg[37]
- Naltrexone/Bupropion[2]
- Semaglutide 2.4mg[3]
- Tirzepatide[38]

Knee OA + Obesity
- Liraglutide 3.0mg[29]
- Semaglutide 2.4mg30, OARSI 2024 April [14]

OSAS + Obesity
- Liraglutide 3.0mg[31]
- Tirzepatide, ADA June 24[32]

Alzheimer's Disease
- Semaglutide oral 14mg, Oct 2026[33,34]
- Liraglutide 1.8, small RCT[44]

Depression + Obesity
- Liraglutide 1.8mg, small open-label[47]
- Naltrexone/Bupropion, small open-label[48]

Dosages: liraglutide dose displayed in text box; naltrexone/bupropion 32/360 mg; semaglutide dose displayed in text box; tirzepatide 5mg, 10mg, 15mg.

1. Pi-Sunyer X et al. N Engl J Med. 2015;373(1):11-22; **2.** Greenway FL et al Lancet 2010; 376: 595-605; **3.** Wilding JPH et L. N Engl J Med. 2021;384(11):989; **4.** Jastreboff AM et al. N Engl J Med 2022;387:205–16; **5.** Wadden TA et al. Obesity (Silver Spring). 2020;28:529–36; **6.** Tronieri JS et al. Int J Obes. 2020;44:353–61; **7.** Grilo CM et al. Am J Psychiatry. 2022;179:927–37; **8.** Wharton S et al. Obesity (Silver Spring). 2023;31(3):703-715; **9.** Davies MJ et al. JAMA. 2015;314(7):687-99; **10.** Hollander P et al. Diabetes Care 2013; 36: 4022-9; **11.** Davies M et al. Lancet. 2021;397(10278):971-84; **12.** Garvey WT et al. Lancet 2023; 402(10402):613-626; **13.** Marso SP et al. N Engl J Med. 2016;28;375(4):311-22; **14.** Marso SP et al. N Engl J Med. 2016;375:1834–44; **15.** Husain M et al. N Engl J Med. 2019;381:841–51; **16.** NCT03914326; **17.** Lincoff AM et al. N Engl J Med. 2023;89(24):2221-2232; **18.** NCT05555512; **19.** NCT04255433; **20.** Kosiborod MN et al. N Engl J Med. 2023;389(12):1069-1084; **21.** NCT04916470; **22.** NCT04847557; **23.** NCT04822181; **24.** NCT03819153; **25.** News Details (novonordisk.com; **26.** NCT04889183; **27.** Le Roux CW et al. Lancet. 2017;389(10077):1399-1409; **28.** NCT05040971; **29.** Gudbergsen H et al. Am J Clin Nutr. 2021;113:314–23; **30.** NCT05064735; **31.** Blackman A et al. Int J Obes (Lond). 2016;40(8):1310-9; **32.** NCT05412004; **33.** NCT04777396; **34.** NCT04777409; **35.** Weghuber D et al. N Engl J Med. 2022;387(24):2245-2257; **36.** NCT06075667; **37.** Kolotkin RL et al. Clin Obes. 2016;6(4):233-42; **38.** Wadden TA et al. Nature Medicine 2023;29:2909–2918; **39.** Armstrong MJ et al. Lancet. 2016;387:679–90; **40.** Newsome PN et al. N Engl J Med. 2021;384:1113–24; **41.** NCT04166773; **42.** Lilly Reports Strong Fourth-Quarter 2023 Financial Results and Provides 2024 Guidance | Eli Lilly and Company; **43.** NCT05536804; **44.** Gejl M et al. Front Aging Neurosci. 2016;8:108; **45.** Elkind-Hirsch KE et al. Fertil Steril. 2022;118(2):371-381; **46.** Papaetis GS et al. Clin Drug Investig. 2020;40(8):695-713; **47.** Mansur RB et al. Eur Neuropsychopharmacol. 2017;27:1153–62; **48.** McElroy SL et al. Prim Care Companion CNS Disord. 201 3;15(3):PCC.12m01494.

CONCLUSIONS

Obesity has been defined by WHO as a disease since 1948. It is at the heart of NCDs, a Gateway Disease, leading to >200 other disease. Diabetes is one of them, there is also cancer, CVD, depression, etc.

It is an adiposity-based chronic disease which is characterised by the function, total amount and distribution of adipose tissue.

People with obesity have Malfunctioning adiposity. Many fat hormones are being disturbed, one of which is GLP1. Therefore GLP1 medications are so effective, partially restoring the body's natural situation.

In patients with obesity, GLP1s also have positive impact on a range of complications. Treating the source therefore makes good disease management and at the same time prevention sense.