

Education in MBS begins with understanding gut hormone physiology and the multimodal treatment of obesity

Roxanna Zakeri MBBS MA PhD FRCS

Consultant Upper GI, Bariatric & General Surgeon, Portsmouth Hospitals University NHS Trust

Honorary Associate Professor, University College London

Young IFSO European Chapter Representative

Associate Surgical Specialty Lead for Bariatric Surgery, Royal College of Surgeons of England



Disclosures



Society affiliations:

IFSO-EC Executive Council

Young IFSO European Chapter Representative

Chair of Young IFSO-EC Taskforce

Royal College of Surgeons of England Associate Surgical Specialty Lead for Bariatric Surgery

Research grants:

National Institute for Health Research (NIHR)

Royal College of Surgeons of England

Rosetrees Trust

Educational grants:

W.L. Gore

Boston Scientific





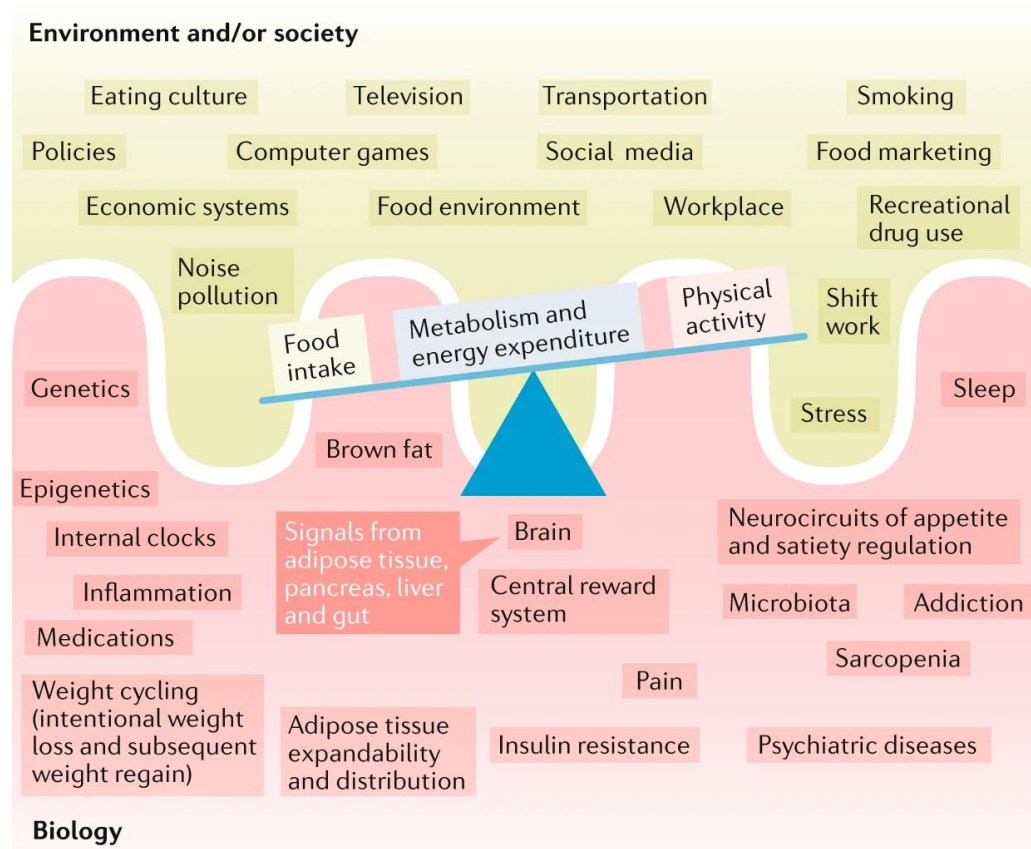
XXIX IFSO World Congress

1-4 September 2026
Toronto, Canada

TORONTO2026 The Future of Obesity Management:
From Weight Loss to Health Gain



Obesity is a complex, multifactorial disease



Adipose tissue



Pancreas



Gut



Genetics



Medications

Homeostatic vs. Hedonic



Energy balance is regulated by the GI tract

Genetics



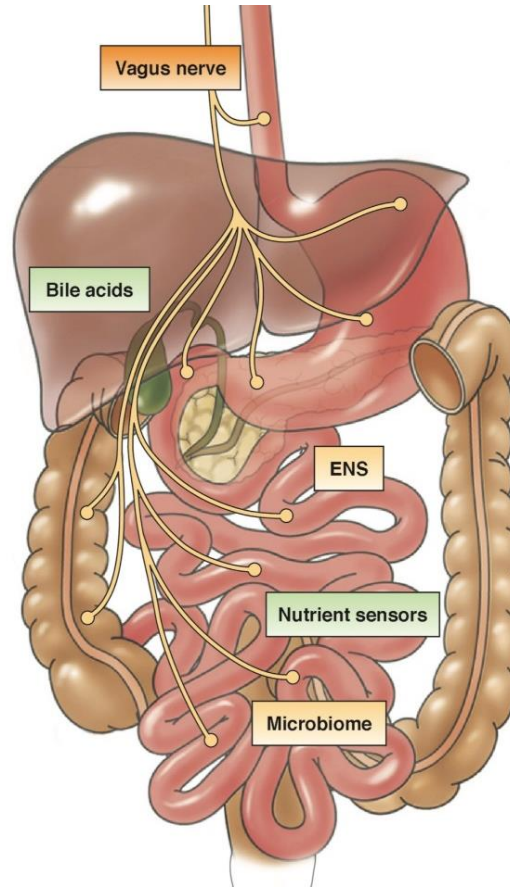
Physiology

Bile acids →
Gut hormone
synthesis and
secretion

Duodenum
• CCK
• GIP
• Ghrelin

Jejunum
• GIP
• GLP1
• Apo A-IV
• Guanylin
• Uroguanylin

Ileum
• GLP1
• Oxyntomodulin
• PYY
• Neurotensin
• Apo A-IV
• Guanylin
• Uroguanylin



Environment

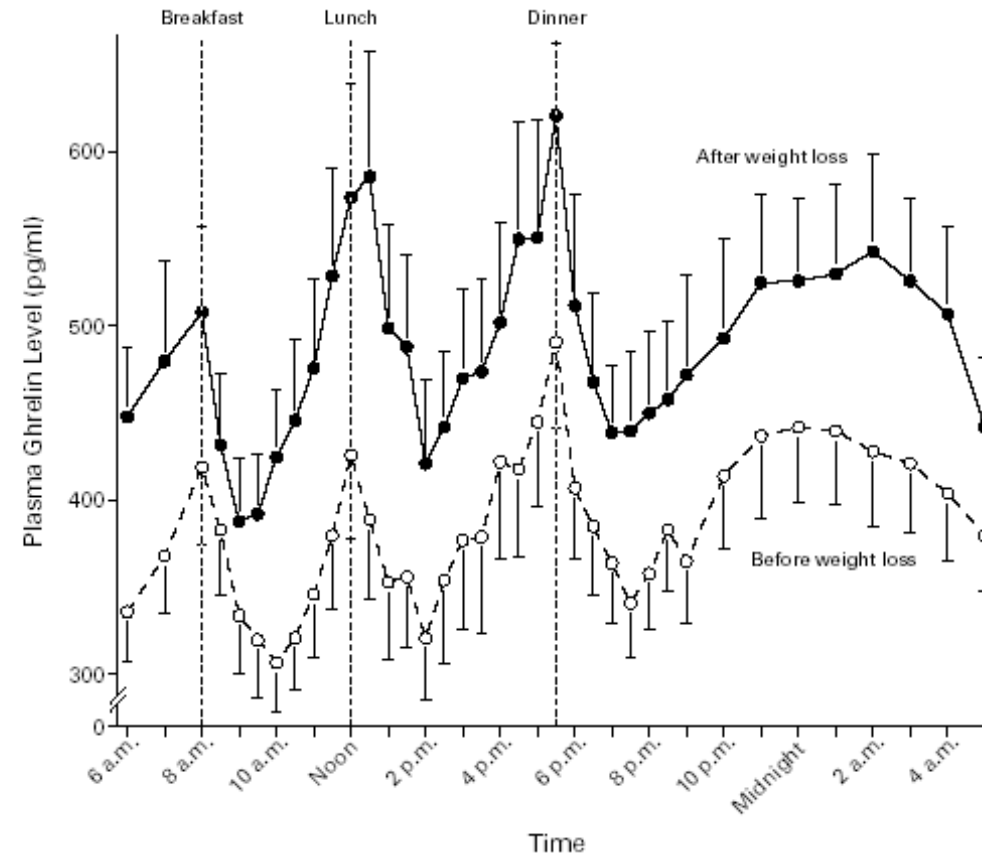


Secretion of digestive
enzymes
GI motility
Appetite
Glucose homeostasis
Energy expenditure



Impact of dietary restriction

- Compensatory responses
- Body aims to replace the lost weight and encourage food intake
- ↑ Ghrelin, ↓ GLP-1 and ↓ PYY



Long-Term Persistence of Hormonal Adaptations to Weight Loss

Priya Sumithran, M.B., B.S., Luke A. Prendergast, Ph.D.,
Elizabeth Delbridge, Ph.D., Katrina Purcell, B.Sc., Arthur Shulkes, Sc.D.,
Adamandia Kriketos, Ph.D., and Joseph Proietto, M.B., B.S., Ph.D.

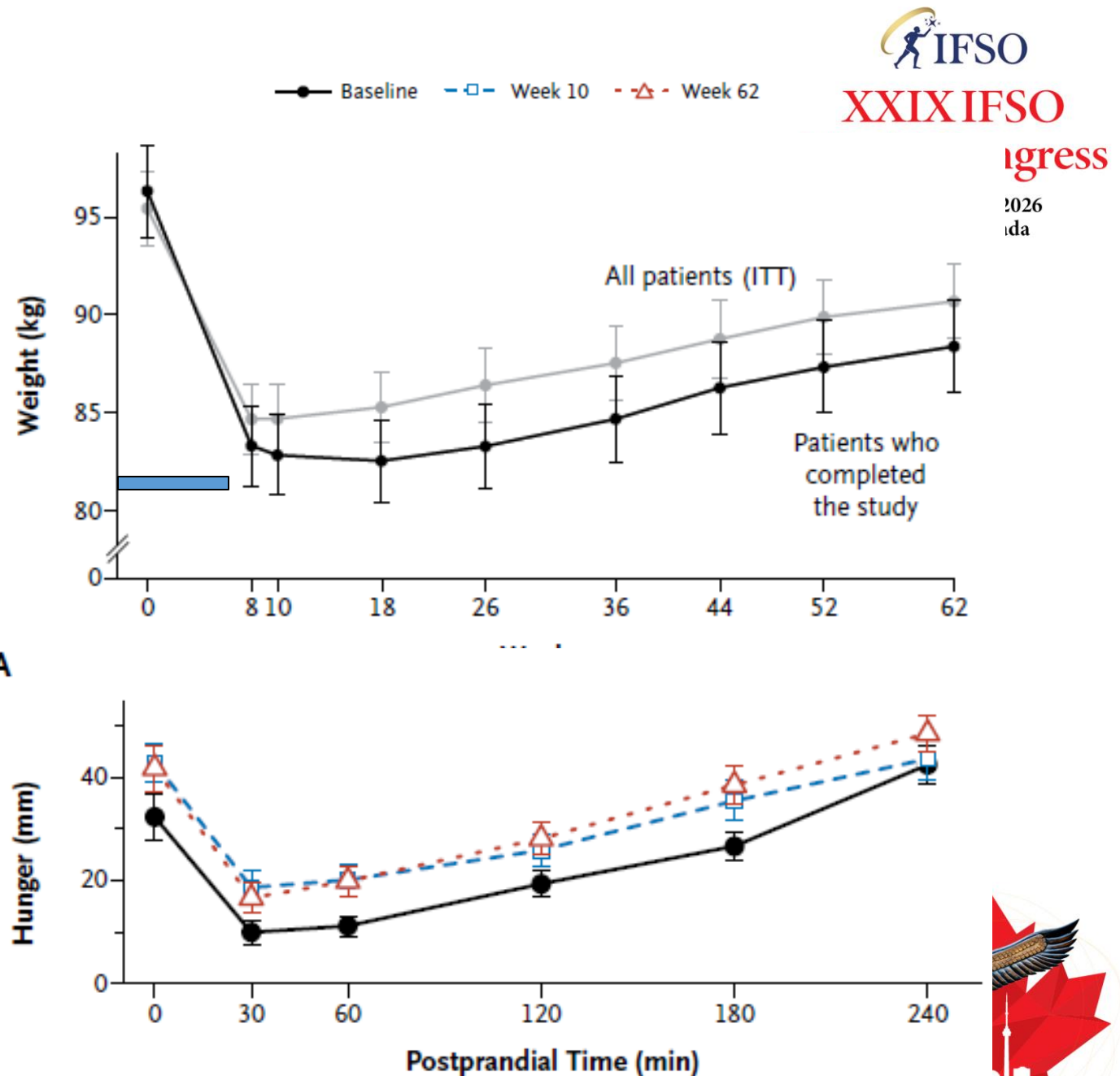
N ENGL J MED 365;17 NEJM.ORG OCTOBER 27, 2011

METHODS

50 patients, 10 wk. weight loss trial.
Appetite and gut hormones measured at
baseline, 10 weeks and at 62 weeks.

RESULTS

Weight loss (~13.5 kg, 14% of initial
weight) led to increase in hunger,
increase in ghrelin and reduction in PYY.



ORIGINAL ARTICLE

Long-Term Persistence of Hormonal Adaptations to Weight Loss

Priya Sumithran, M.B., B.S., Luke A. Prendergast, Ph.D.,
Elizabeth Delbridge, Ph.D., Katrina Purcell, B.Sc., Arthur Shulkes, Sc.D.,
Adamandia Kriketos, Ph.D., and Joseph Proietto, M.B., B.S., Ph.D.

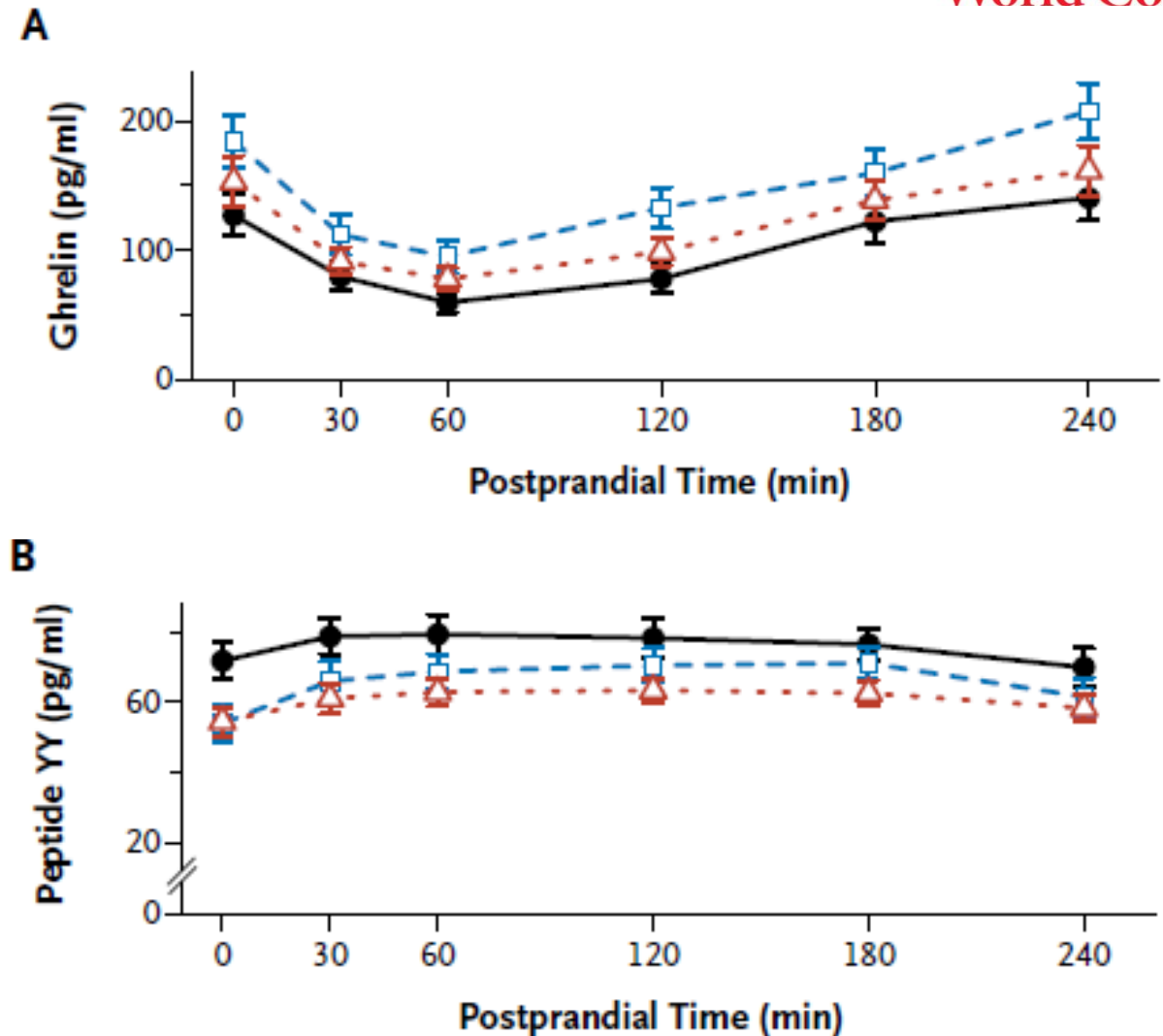
N ENGL J MED 365;17 NEJM.ORG OCTOBER 27, 2011

METHODS

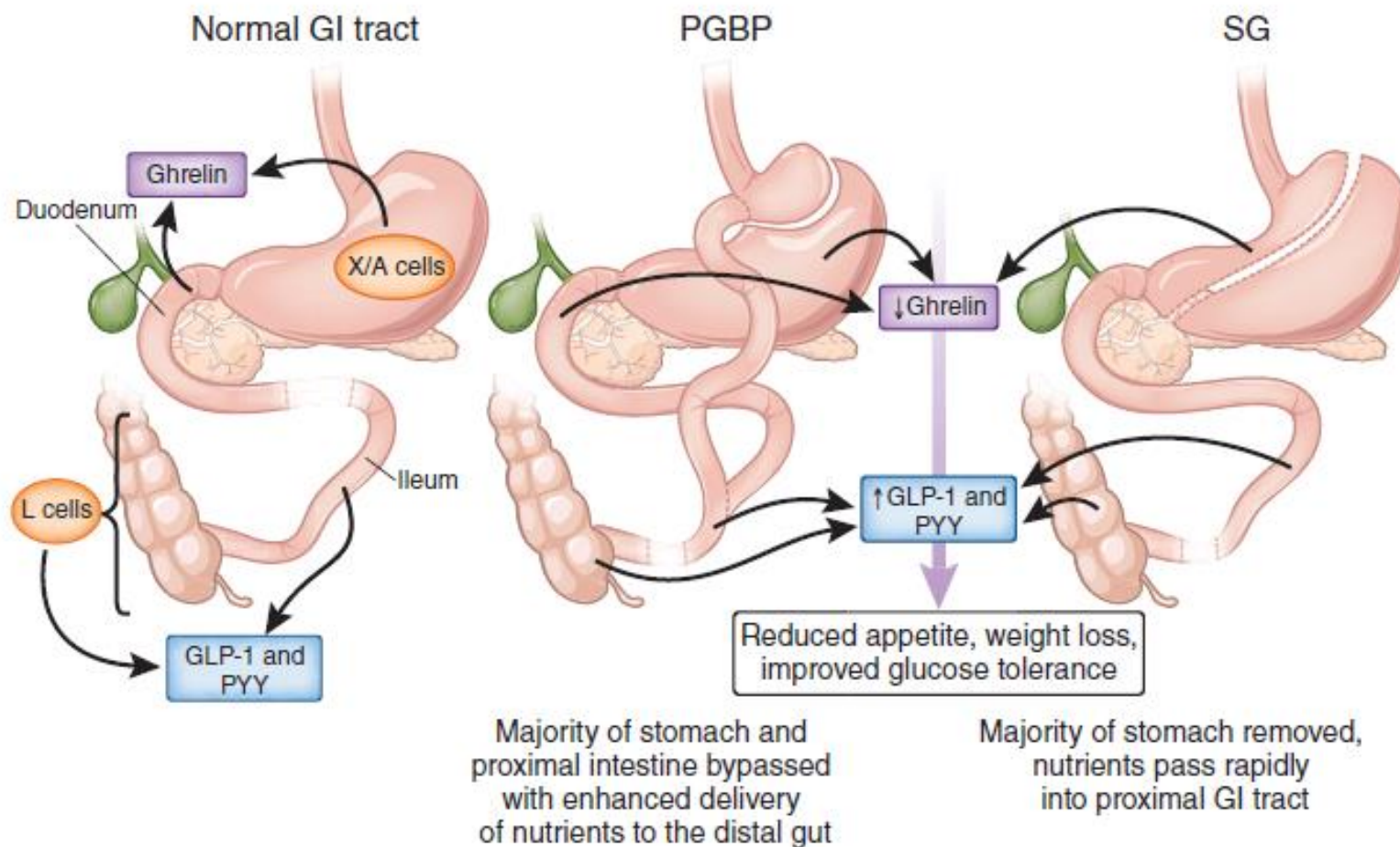
50 patients, 10 wk. weight loss trial.
Appetite and gut hormones measured at
baseline, 10 weeks and at 62 weeks.

RESULTS

Weight loss (~13.5 kg, 14% of initial
weight) led to increase in hunger,
increase in ghrelin and reduction in PYY.



Changing anatomy changes physiology

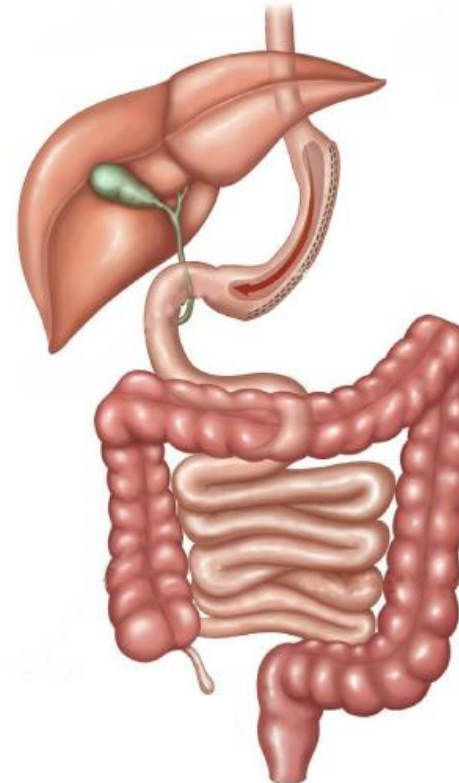


Roux-en-Y Gastric Bypass (RYGB)

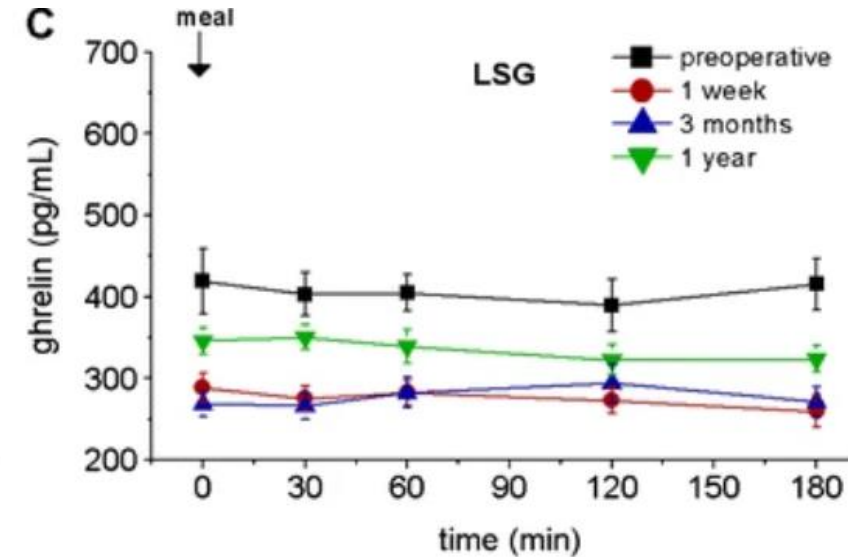
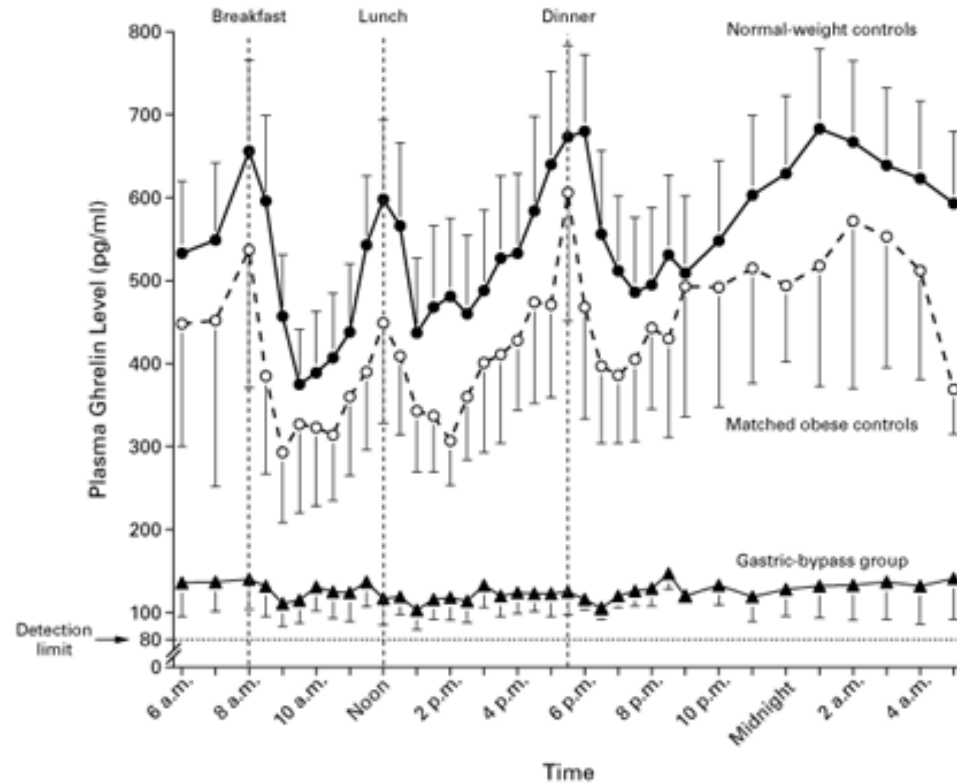


+	Calorie restriction	+
↑	Vagal nerve signaling	↑
+	Taste and smell changes	+
+	Food aversions	+
↓	Ghrelin	↓↓↓
↑	Bile acid secretion	↑
↑	Intestinal glucose uptake	
+	Fat malabsorption	
↑↑	GLP-1	↑
↑↑	PYY3-36	↑
↓	GIP	
↑	Oxyntomodulin	
↑↑	FGF-19	↑
↑	CCK	↑
↓	Gastrin	↑
↑	Neurotensin	

Sleeve Gastrectomy (SG)



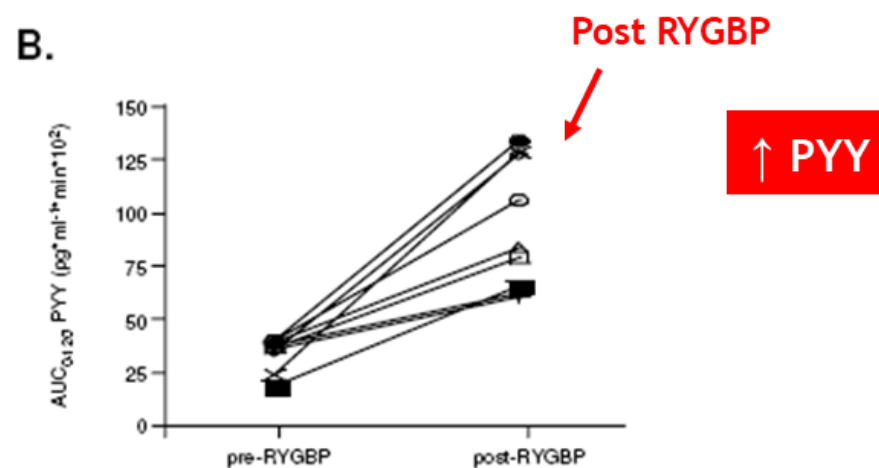
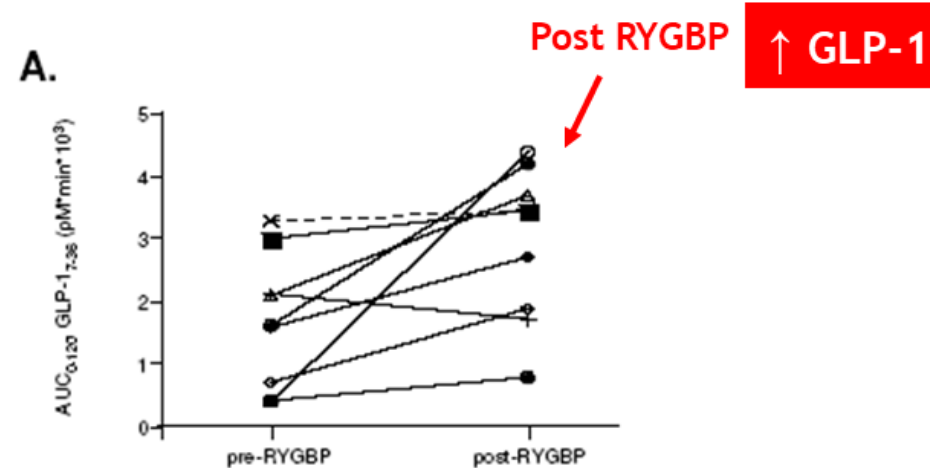
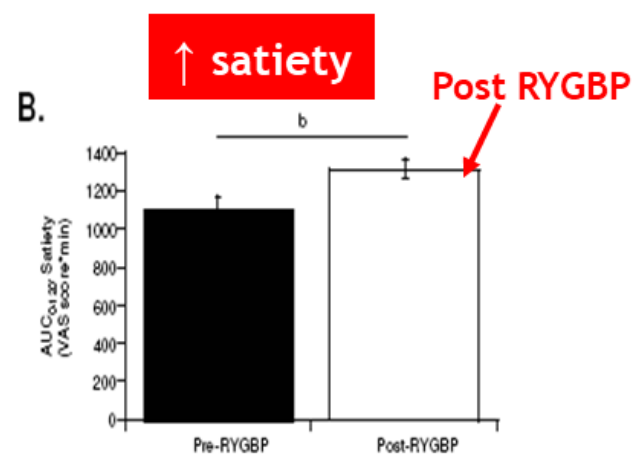
RYGB and SG ↓ Ghrelin

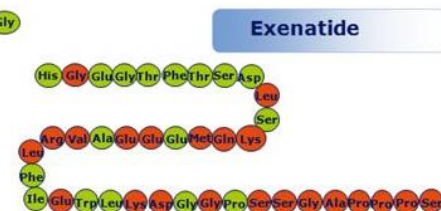


Cummings et al. N Engl. J. Med. May 2002



RYGB reduces hunger and increases satiety





97% homology
to native GLP-1

53% homology
to native GLP-1



XXIX IFSO World Congress

1-4 September 2026
Toronto, Canada

RETA+CAG

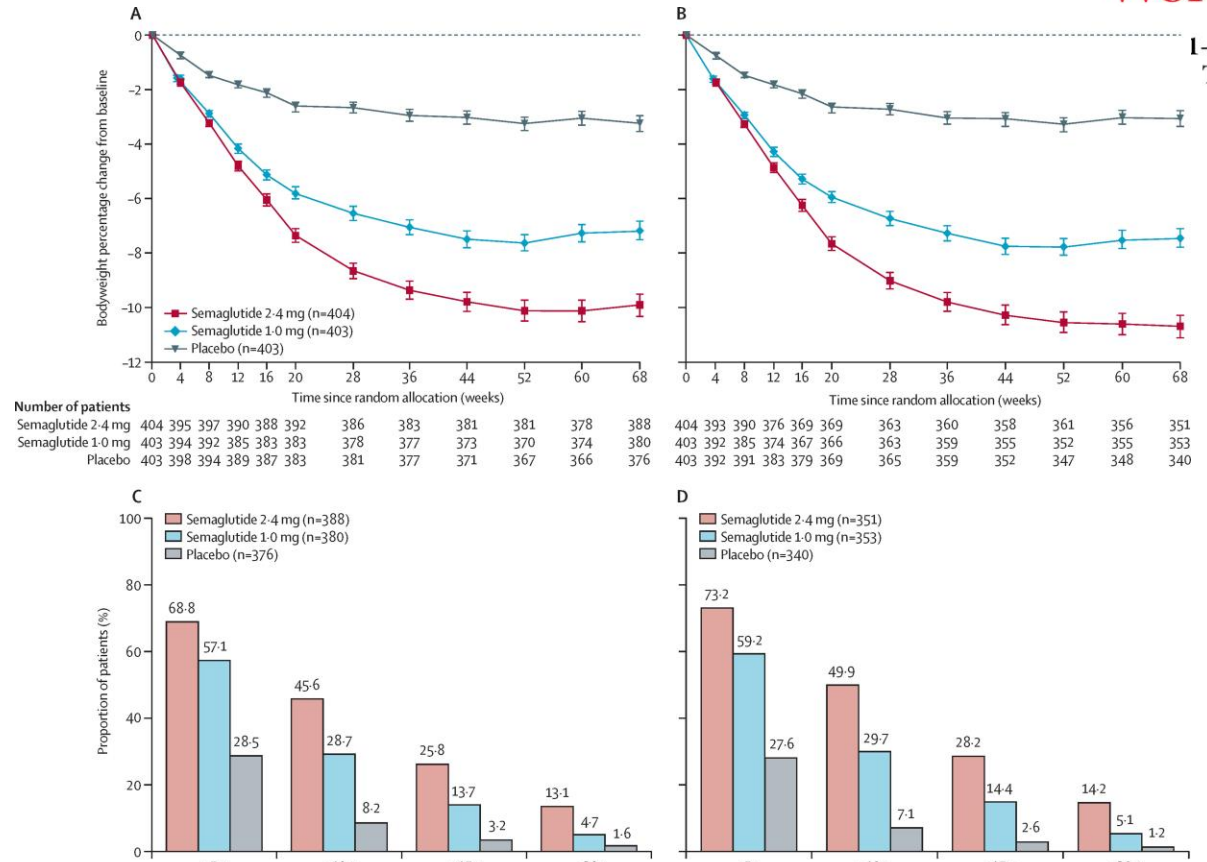
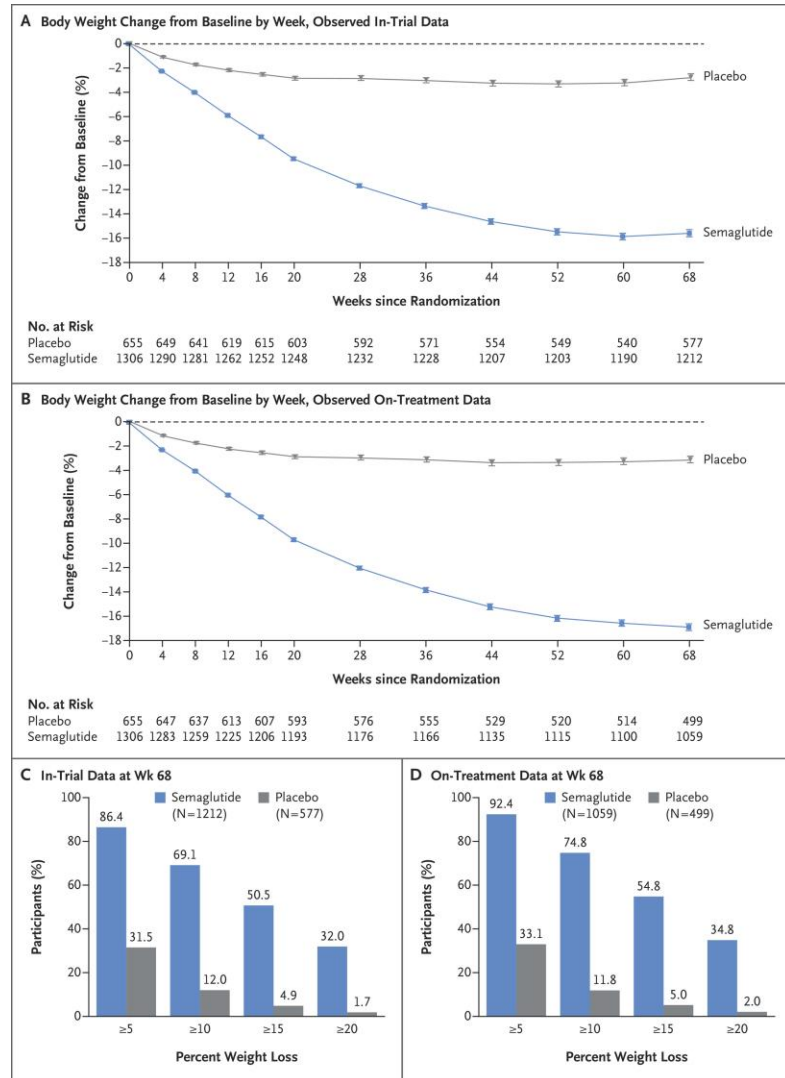


SURGERY	PHARMACOTHERAPY
Anatomical intervention creating multiple physiological effects	Targeted amplification of selected physiological pathways
Durable, powerful population-level effect	Titration, reversible and adaptable
Variable individual response	Variable individual response
May require pharmacological support	May precede, complement or follow surgery



STEP 1

STEP 2



SURMOUNT



The NEW ENGLAND
JOURNAL of MEDICINE

CURRENT ISSUE ▾ SPECIALTIES ▾ TOPICS ▾

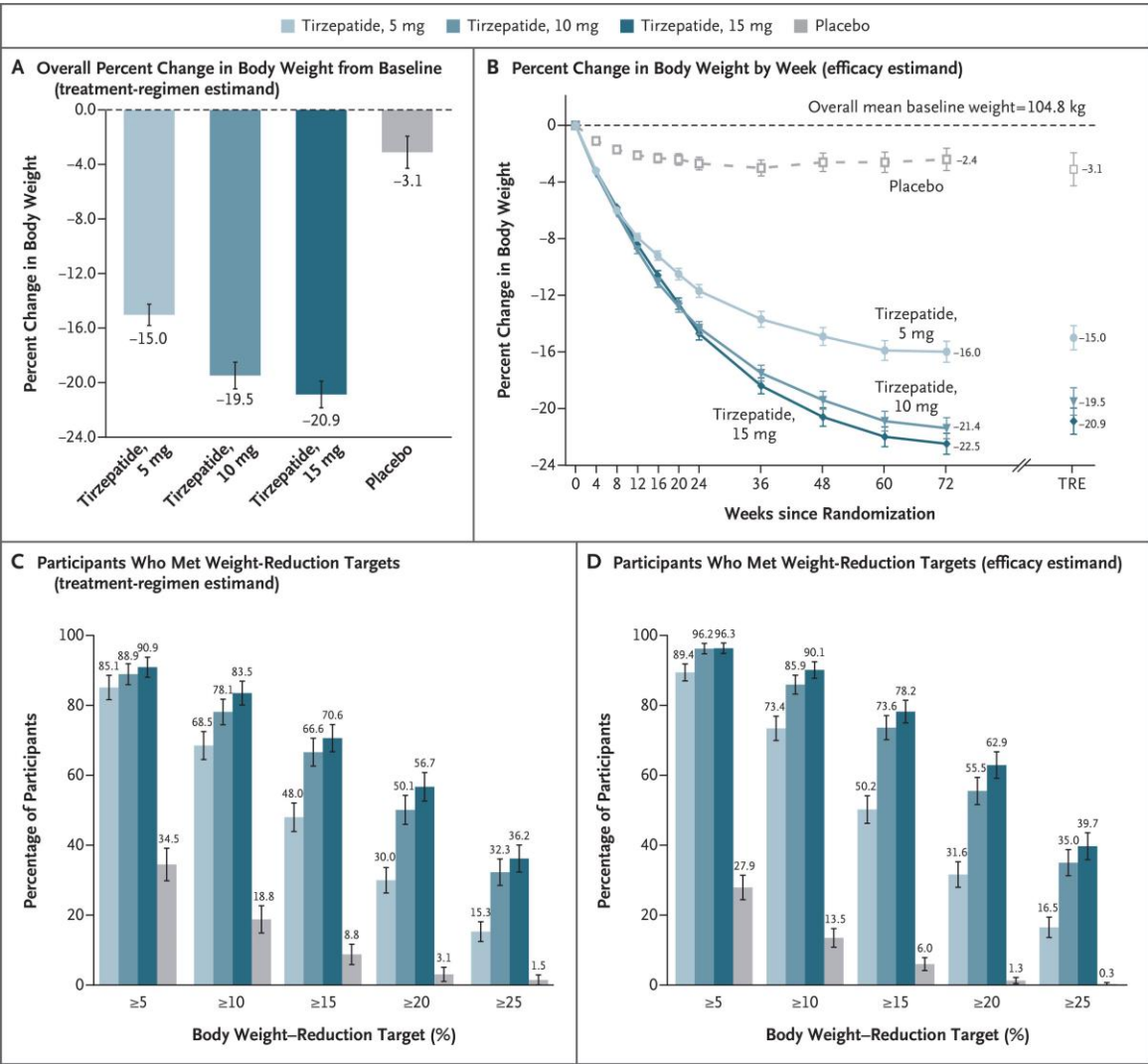
ORIGINAL ARTICLE

f X in e

Tirzepatide Once Weekly for the Treatment of Obesity

Authors: Ania M. Jastreboff, M.D., Ph.D., Louis J. Aronne, M.D., Nadia N. Ahmad, M.D., M.P.H., Sean Wharton, M.D., Pharm.D., Lisa Connery, M.D., Breno Alves, M.D., Arihiro Kiyosue, M.D., Ph.D., Shuyu Zhang, M.S., Bing Liu, Ph.D., Mathijs C. Bunck, M.D., Ph.D., and Adam Stefanski, M.D., Ph.D., for the SURMOUNT-1 Investigators* [Author Info & Affiliations](#)

Published June 4, 2022 | N Engl J Med 2022;387:205-216 | DOI: 10.1056/NEJMoa2206038 | [VOL. 387 NO. 3](#)



XXIX IFSO
World Congress

1-4 September 2026
Toronto, Canada

TORONTO2026 The Future of Obesity Management:
From Weight Loss to Health Gain



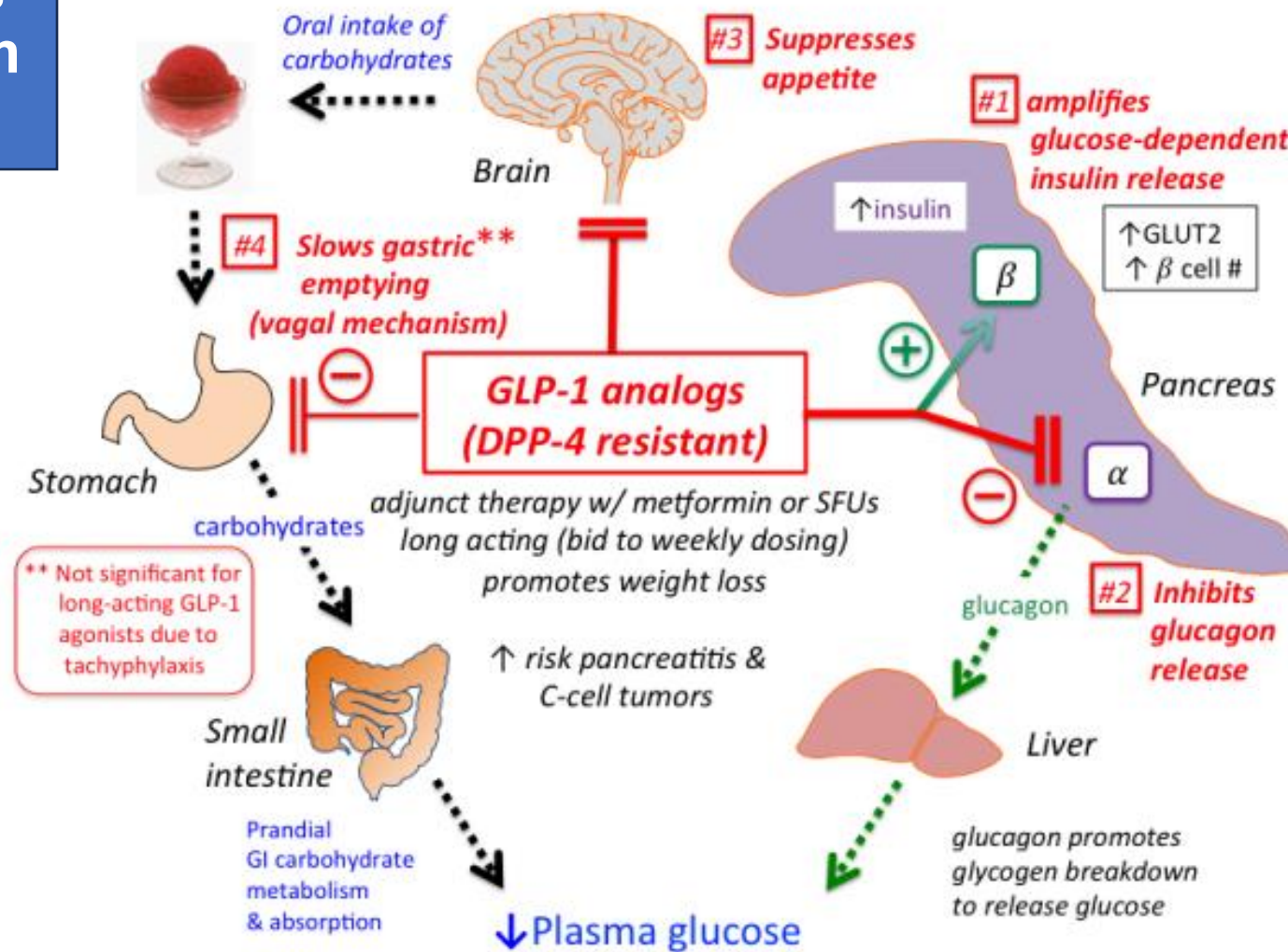
**Neoadjuvant
therapy**

**Procedural
intervention**

**Adjuvant
therapy**



Multi-organ, multi-system targets



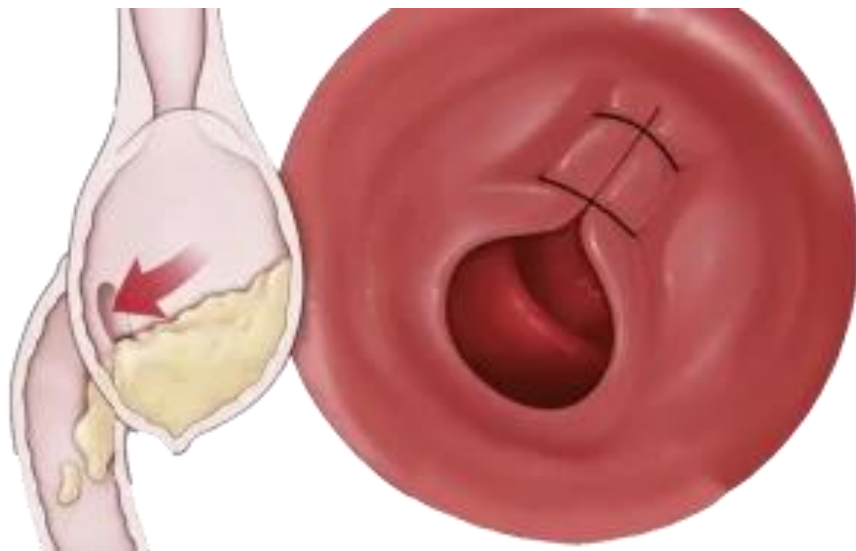
Still much to learn...

- Non-responders or suboptimal responders
- Endogenous vs. exogenous GLP1 / incretin augmentation
- Therapeutic effects of other neuroendocrine mediator and peptide analogues
- MOA of weight-independent cardiometabolic and multi-organ health benefits
- Strategic implementation to the obesity care pathway





 **IFSO**
XXIX IFSO
World Congress
1-4 September 2026
Toronto, Canada

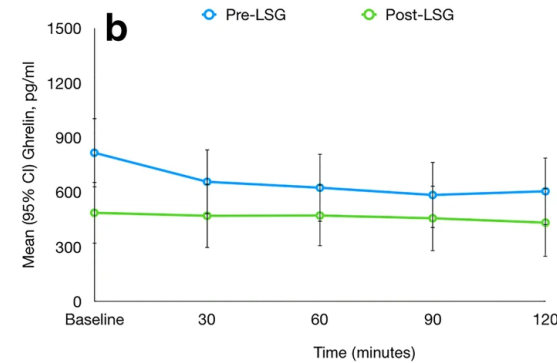
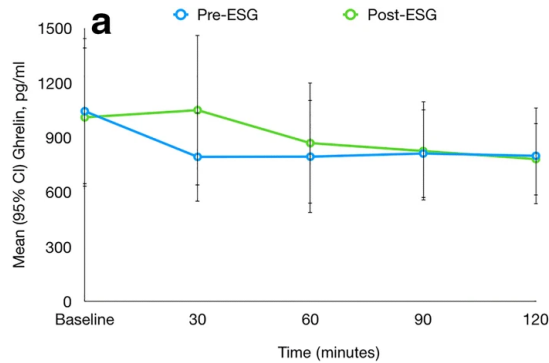


TORONTO2026 The Future of Obesity Management:
From Weight Loss to Health Gain

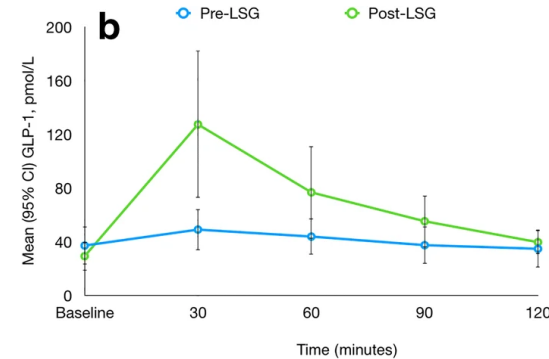
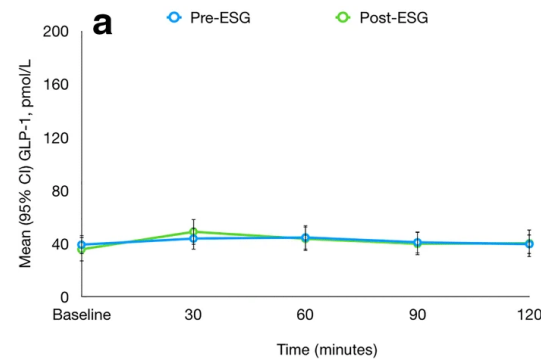


Gut hormone response to ESG

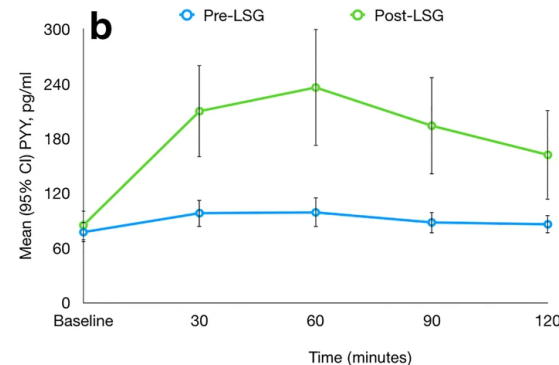
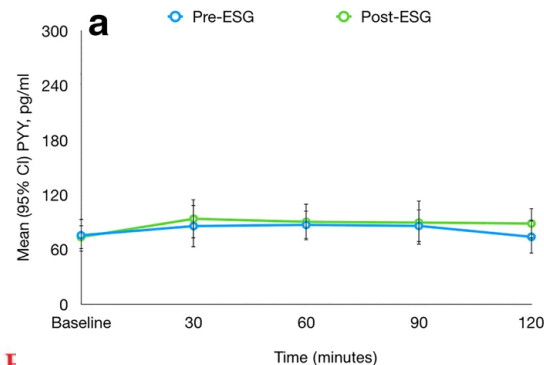
Ghrelin



GLP-1



PYY



Similar sleeve geometry does not mean identical physiology



Gut hormone response to ESG



Mechanistic sub-study MERIT trial

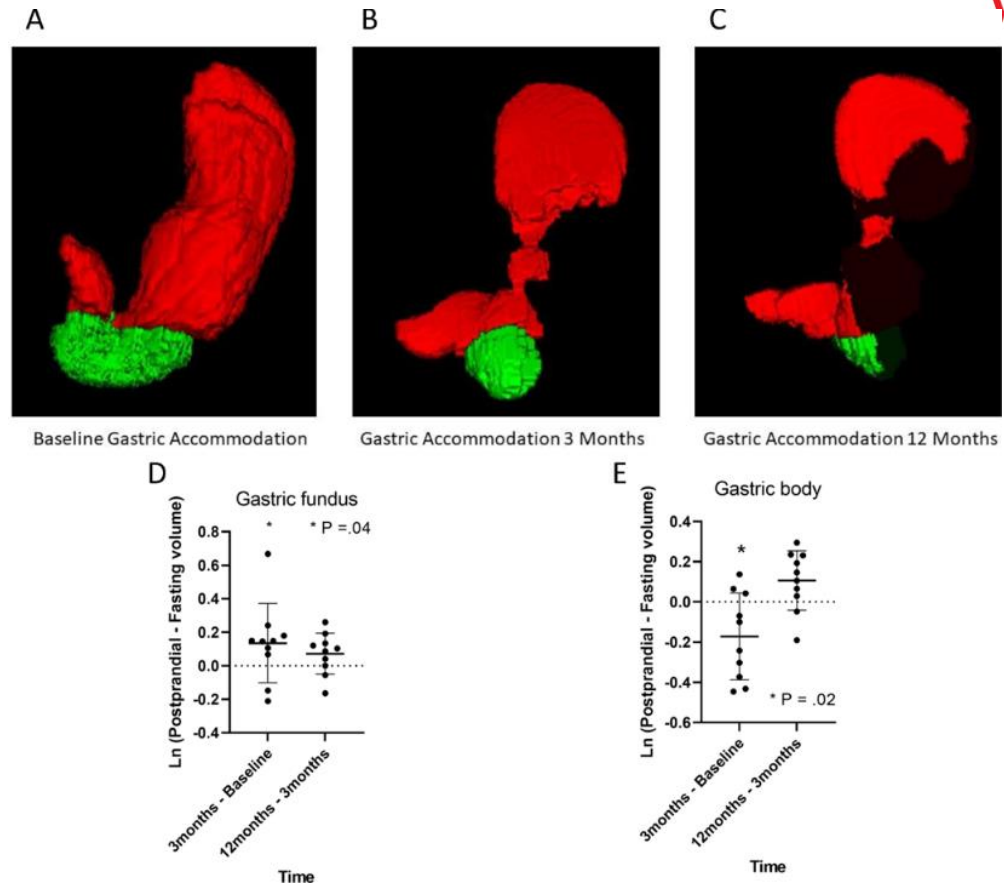
36 participants: 18 ESG and 18 lifestyle treatment

- 12m ↑ Fasting ghrelin, ↔ GLP-1 and PYY
- 18m ↑ Fasting ghrelin, GLP-1 and PYY



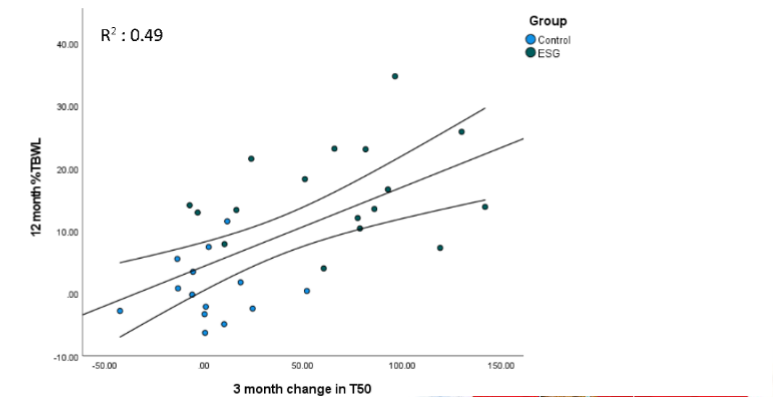
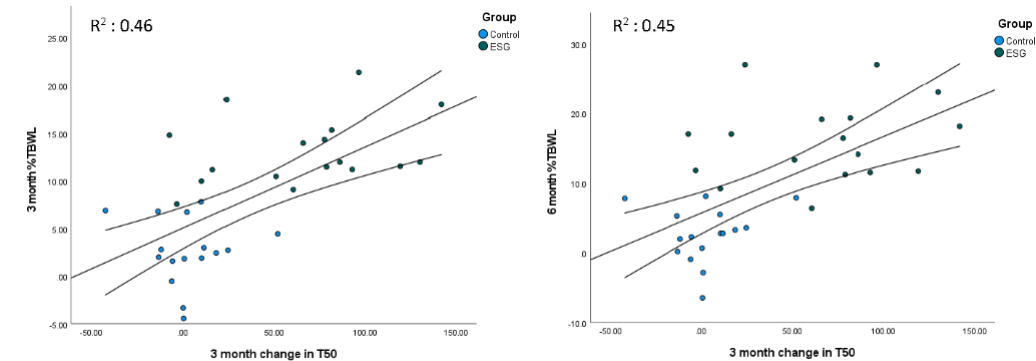
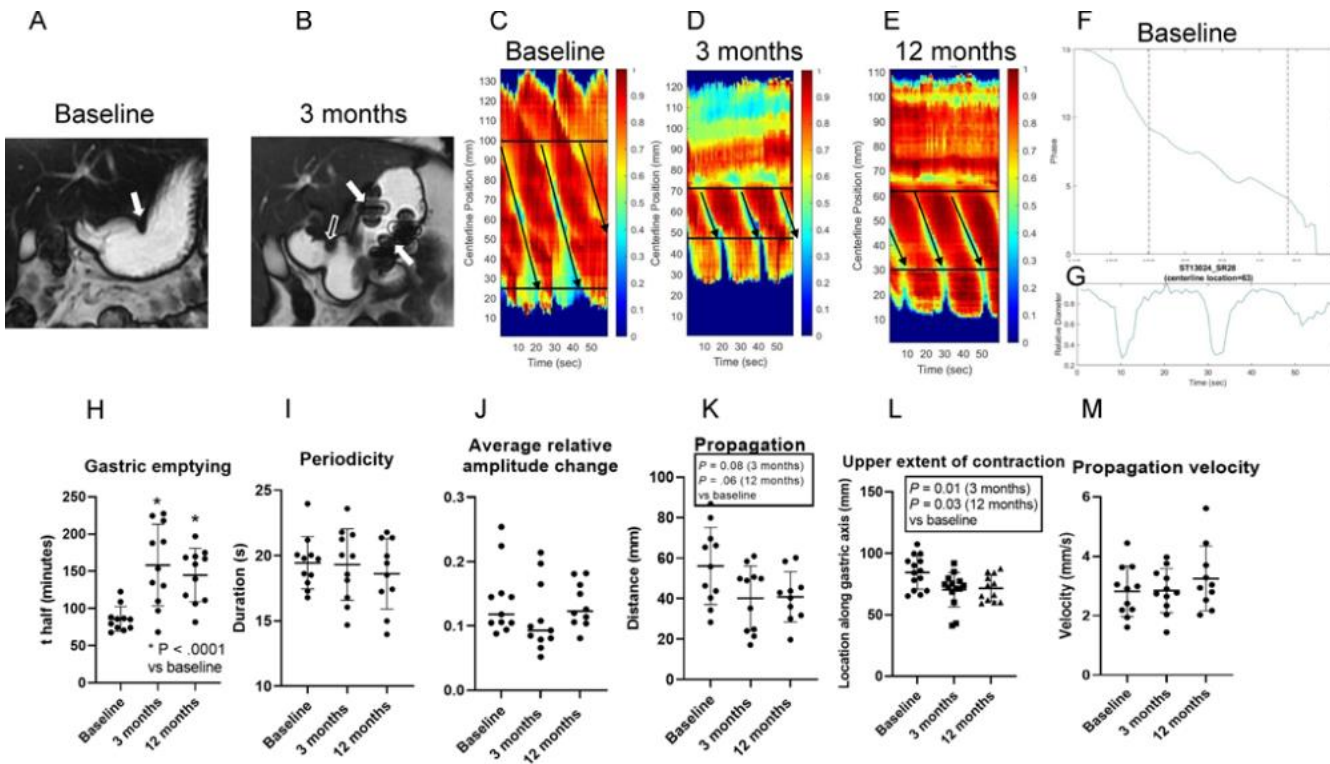
Other mechanisms of action of ESG

- Decreased gastric accommodation



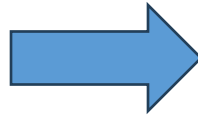
Other mechanisms of action of ESG

- Decreased gastric accommodation
- Delayed gastric emptying



Other mechanisms of action of ESG

- Decreased gastric accommodation
- Delayed gastric emptying
- Improved satiation and eating behaviour

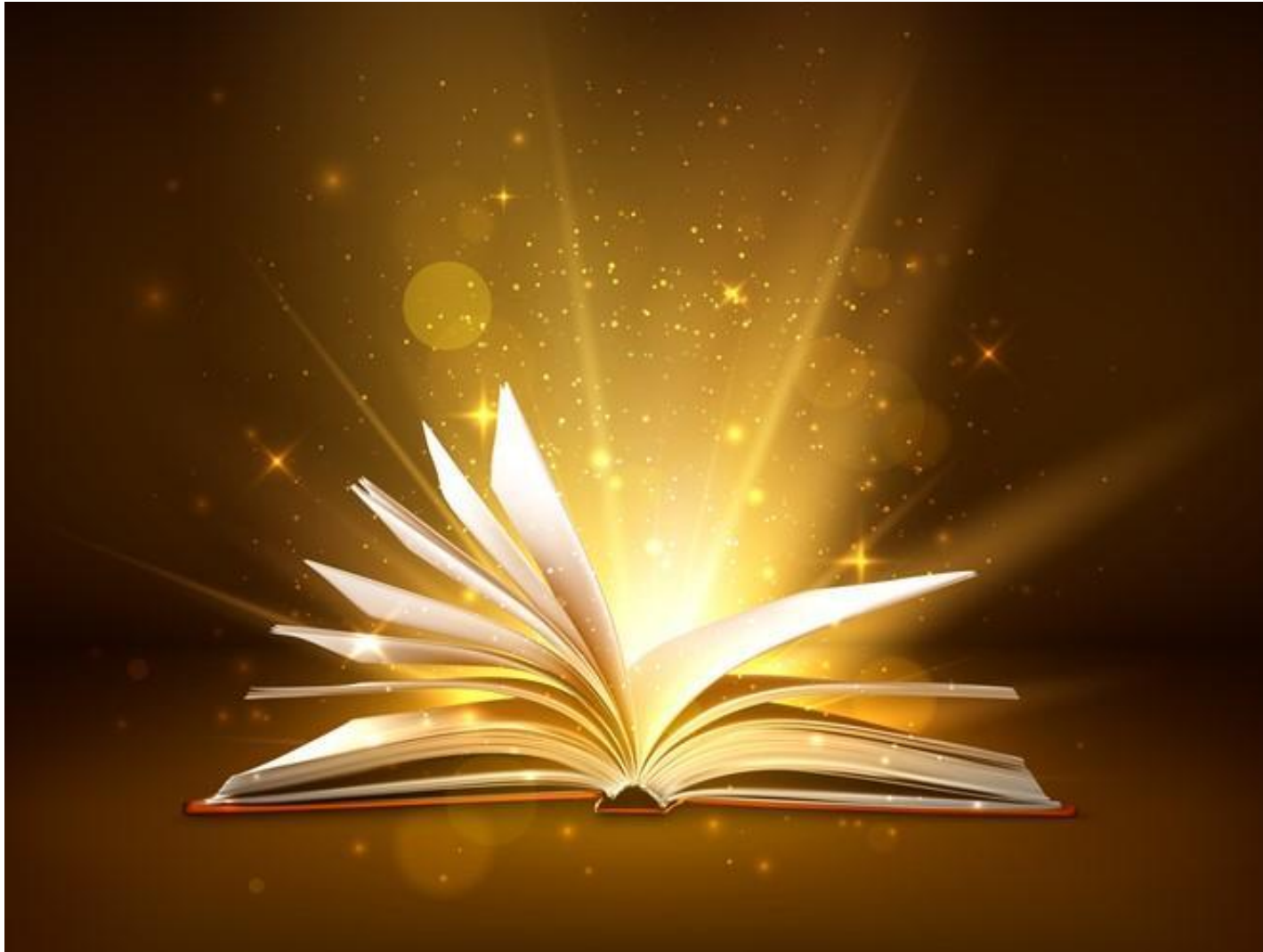
 may not directly relate to incretins



The optimal MBS curriculum

 IFSO
XXIX IFSO
World Congress

1-4 September 2026
Toronto, Canada



TORONTO2026 The Future of Obesity Management:
From Weight Loss to Health Gain



The optimal MBS curriculum

Should enable surgeons to:

- Explain obesity as a chronic, biologically regulated disease
- Explain how MBS works
- Understand the principal gut–brain pathways and incretin physiology
- Understand indications, benefits and limitations of obesity management medications
- Select and sequence surgery, pharmacotherapy, endobariatric procedures and behavioural/nutritional care.
- Recognise biological variability without blaming the patient or declaring a treatment a “failure”
- Educate the importance of recognising and mitigating weight stigma



Precision Bariatric Surgery





Get together!

Foyer 700 @ 17:30

IFSO
XXIX IFSO
World Congress

1-4 September 2026
Toronto, Canada

Social media study



XXX IFSO WORLD CONGRESS

"Advancing Multimodal Obesity Care"

24-27 August 2027

ifso2027.org



IFSO
PARIS 2027

See you in

PARIS





**34th EUROPEAN
CONGRESS
ON OBESITY**
www.eco2027.org

34TH EASO & 15TH IFSO-EC JOINT CONGRESS

18-21 May 2027 – Munich, Germany



**15th IFSO EUROPEAN
CHAPTER
CONGRESS**
www.ifso-ec2027.com

**FOLLOW US ON OUR
SOCIAL MEDIA CHANNELS!**



@ifso_ec



IFSO European Chapter
Group



IFSO European
Chapter



@ifso_ec