

Adolescents First?

The case for endoluminal obesity therapy

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Disclosure Slide

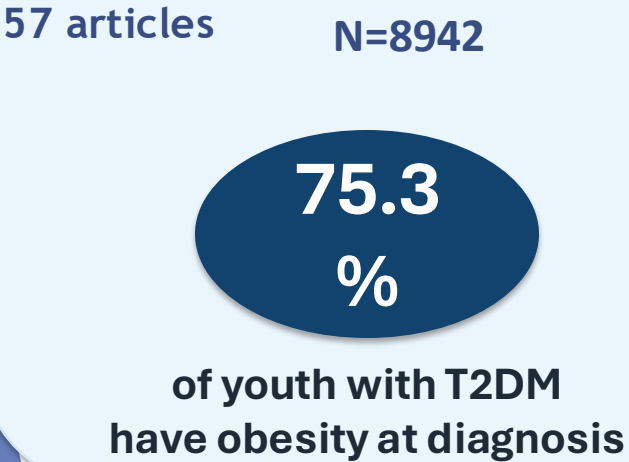
- ▶ Boston Scientific speaker and consultant
- ▶ Eli Lilly Scientific speaker and consultant

Adolescent Obesity & T2DM: A Rapidly Rising Metabolic Burden

The Prevalence of Obesity Among Children With Type 2 Diabetes A Systematic Review and Meta-analysis

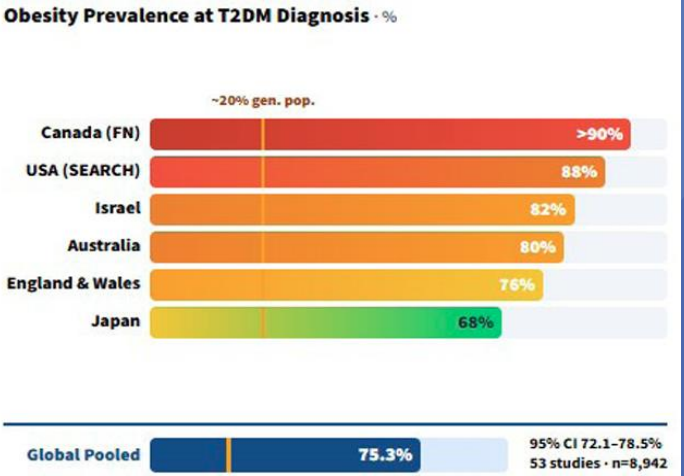
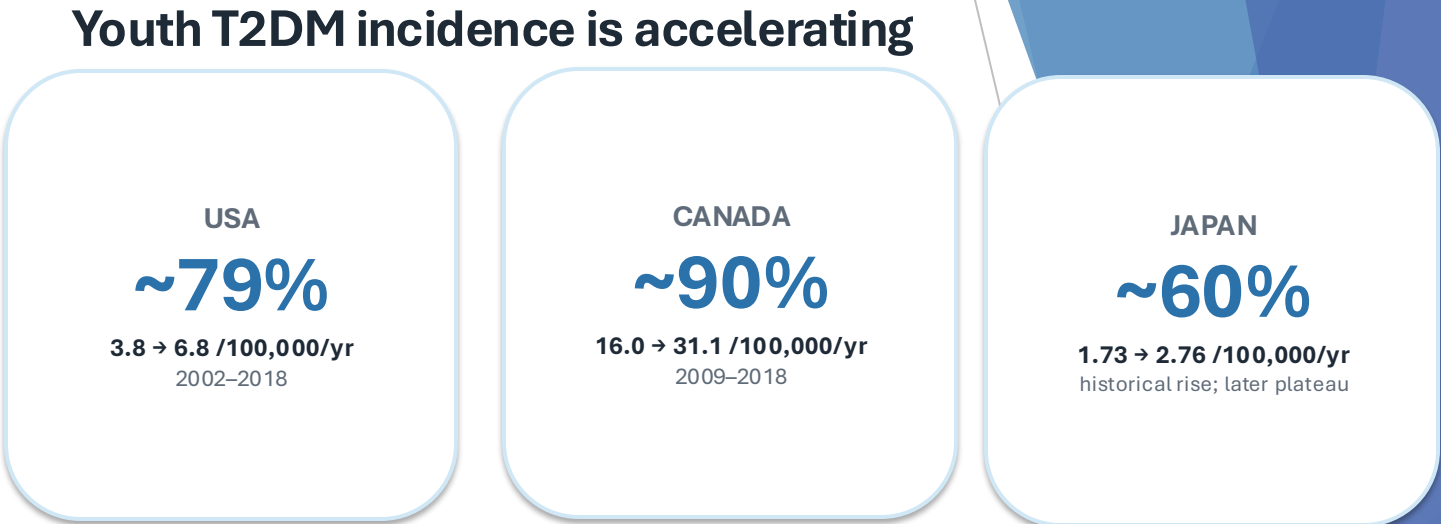
Milena Cloana, BHSc^{1,2}; Jiawen Deng, BHSc^{1,2}; Ajantha Nadarajah, BHSc^{1,2}; et al

2022



Linking pediatric obesity to youth-onset type 2 diabetes: integrated longitudinal and cross-sectional evidence from population-based studies worldwide

Ashraf T. Soliman, MD, PhD, Fawzia Alyafei, MD, Nada Alaaraj, MD, Noor Hamed, MD, Shayma Mohamed, MD, Ahmed Elawwa, MD
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Obesity is present in ~3 of 4 youth with T2DM — while incidence has risen sharply across multiple populations.

Pediatric Obesity & Hypertension

Hypertension is a common cardiometabolic complication of obesity in youth

28.0%

Pooled prevalence of hypertension
in children & adolescents with obesity

Evidence

26 studies

95% CI: 20.2–36.6%

≈ 1 in 4 children and adolescents with obesity

Table 3. Analysis of Comorbidities for Obesity in Children and Adolescents

Comorbidity	Studies, No.	Events, No.	Total, No.	Prevalence (95% CI)	I ² , %
Hypertension	26	5583	195,22	28.02 (20.16-36.61)	99.2
Dental caries	13	36 472	531 470	17.88 (12.61-23.83)	99.8
Vitamin D deficiency	8	705	4546	11.63 (5.36-19.86)	98.3
Asthma	7	844	7696	18.84 (12.46-26.16)	97.7
Diabetes	3	62	5916	1.23 (0.23-2.98)	95.1
Flatfoot	3	69	354	26.08 (6.69-52.19)	95.8
Anxiety	2	316	1173	25.08 (0-94.18)	99.9
Depression	2	379	1166	35.24 (0.44-86.90)	99.7

Research

JAMA Pediatrics | Original Investigation

Global Prevalence of Overweight and Obesity in Children and Adolescents A Systematic Review and Meta-Analysis

Xinyue Zhang, PhD; Jiaye Liu, PhD; Yinyun Ni, PhD; Cheng Yi, MD; Yiqiao Fang, MD; Qingyang Ning, MD; Bingbing Shen, MD; Kaixiang Zhang, MD; Yang Liu, MD; Lin Yang, MD; Kewei Li, PhD; Yong Liu, PhD; Rui Huang, PhD; Zhihui Li, PhD

JAMA Pediatrics

KEY MESSAGE Obesity in youth carries a substantial early cardiovascular burden.

Pediatric Obesity & Obstructive Sleep Apnea

Obesity is associated with a markedly higher prevalence of OSA in children

Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity

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45%

Children with obesity

9%

Healthy-weight children

≈ 5× higher prevalence

Study supporting AAP estimate: n = 172 | Age 7–18 years | 139 overweight/obesity + 33 normal weight

Journey of Innovation: Transformation of Pediatric Bariatric Surgery

1970s–1980s
Early Beginnings

- Exploration of Bariatric Surgery in Adults
- Pediatric obesity wasn't yet a primary focus;
- 1st bariatric procedure performed was jejunoileal bypass & biliopancreatic diversion in adolescents.

1980s–1990s
Early beginnings

- VGB offered to adolescents but benefits did not outweigh post surgical complications

1990s
Pediatric Obesity Recognition

- Surgeons begin considering surgical solutions for severe pediatric obesity, though procedures remain controversial

2000s
1st Pediatric Bariatric Procedures

Landmark studies & procedures begin in the U.S. & internationally for adolescents with severe obesity, focusing on RYGB & AGB.

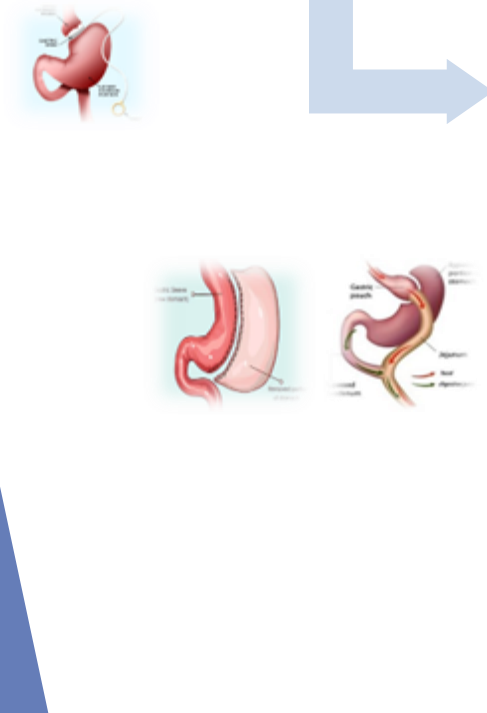
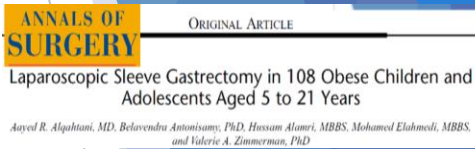
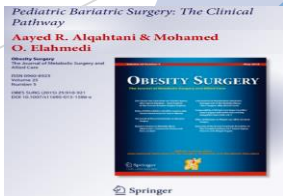
2010s
Guidelines

2019 ESG in adolescent



Endoscopic Sleeve Gastroplasty in 109 Consecutive Children and Adolescents With Obesity: Two-Year Outcomes of a New Modality
Aayed Alqahtani, MD, FRCSC, FACS¹, Mohamed Elahmedi, MBBS¹, Yara A. Alqahtani, MD¹ and Abdullah Al-Darwish, MD¹

2020
Standardization and Multidisciplinary Care



Between 1997–2003, the frequency of bariatric surgery for adolescents increased 3- to 5-fold.

Treatment Options for Pediatric Patients



Diet



Lifestyle



Exercises



Medications



Tirzepatide



Semaglutide



Liraglutide



Endoscopic Procedures



Endosleeve



POSE



Gastric Balloon



Transpyloric Shuttle



Duodenojejunal bypass



Jejunal Ileal bypass



Gastroduodeno jejunal bypass



Duodenomucosal resurfacing/remodeling



Surgical Procedures



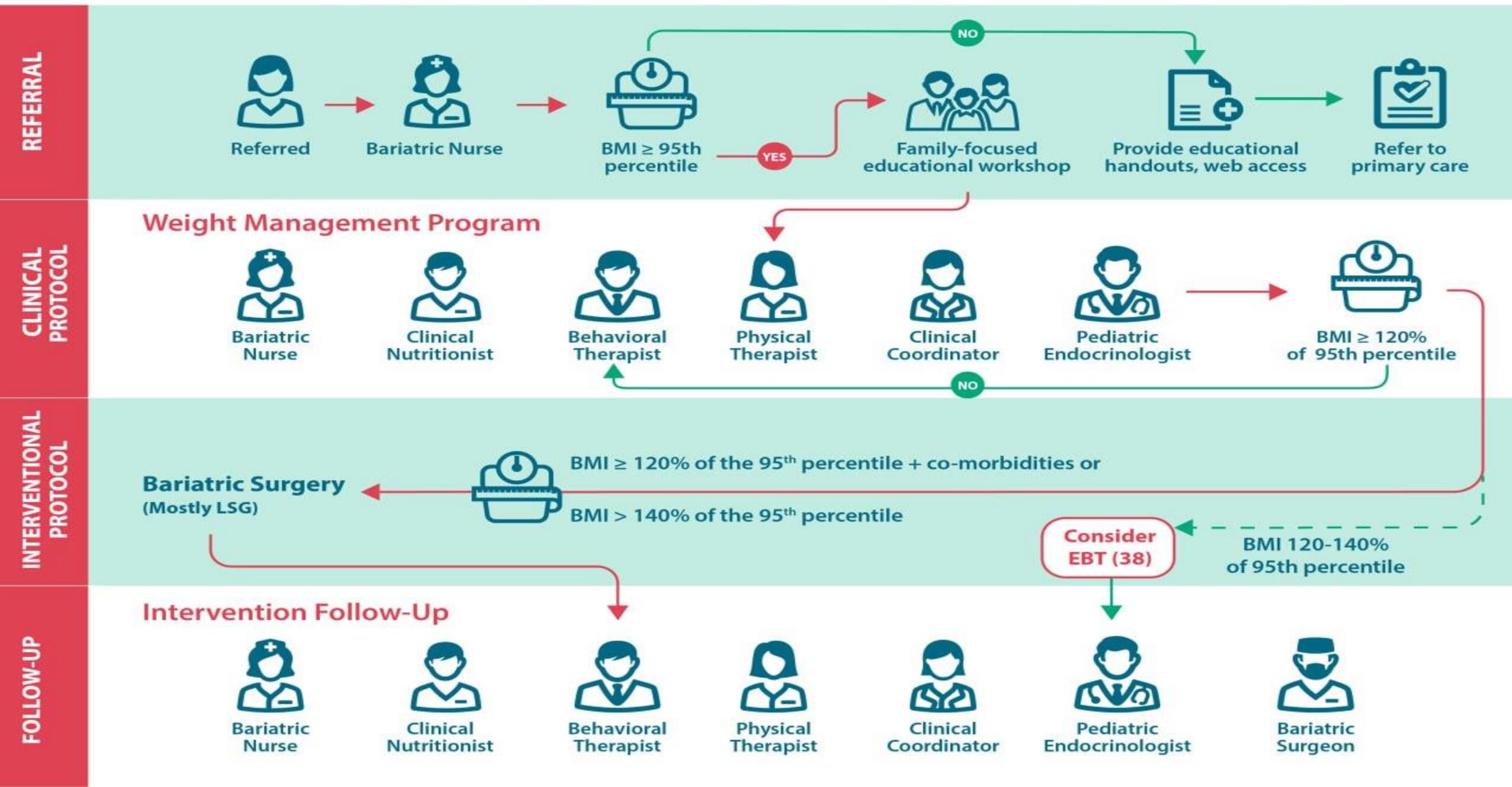
Sleeve Gastrectomy



Roux-En-Y Gastric Bypass



Multidisciplinary Pediatric Interventional Weight Loss Flowchart



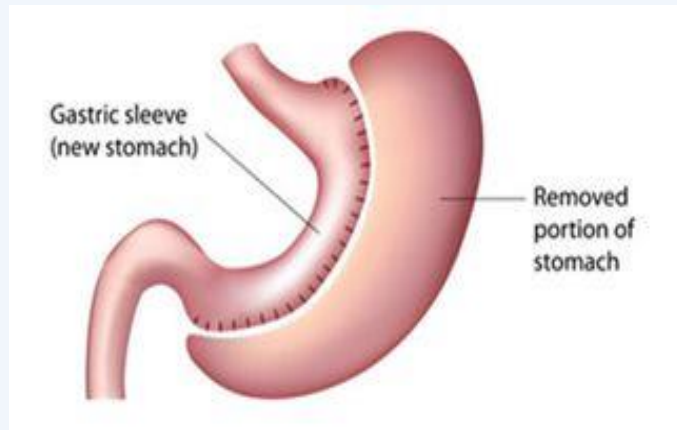
Bariatric Surgery Options for Pediatric Obesity

The two principal metabolic and bariatric procedures used in adolescents

01 Sleeve Gastrectomy

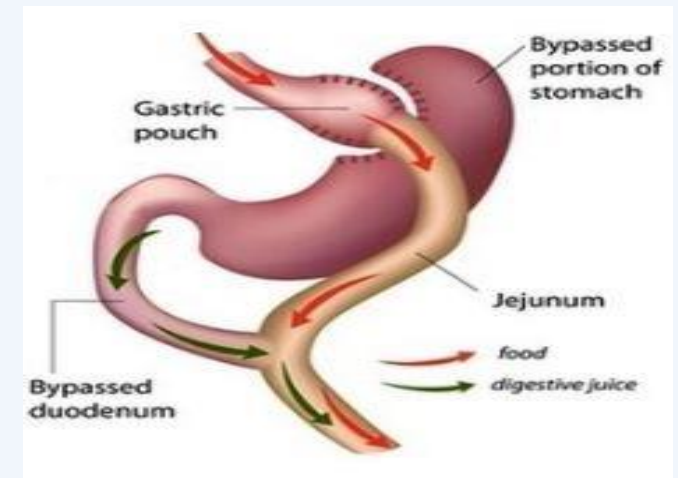
SG

Restrictive



02 Roux-en-Y Gastric Bypass

RYGB



SG and RYGB remain the main surgical options for adolescent severe obesity

Global Pediatric MBS Practice: Key Findings

IFSO-affiliated national societies • 66 of 76 societies responded (86.8%)

75.8%

National guidelines

reported having pediatric MBS guidelines

46%

IFSO criteria

followed IFSO BMI-based indications

31.8%

Maturity restrictions

required age, puberty or bone-growth criteria

69.2%

Sleeve gastrectomy

most commonly recommended procedure

35% / 33%

Referral

pediatricians / parents were leading referrers

59.1%

Financial coverage

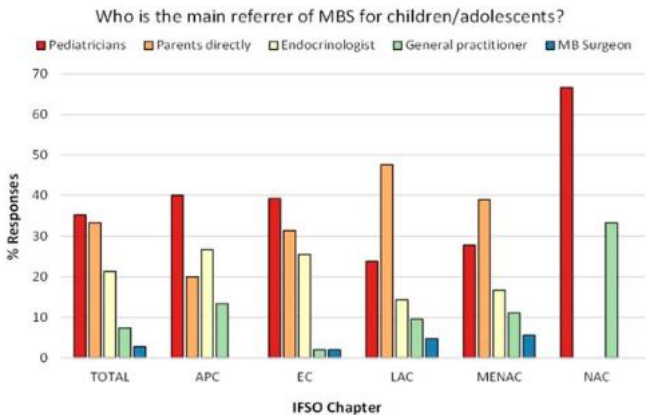
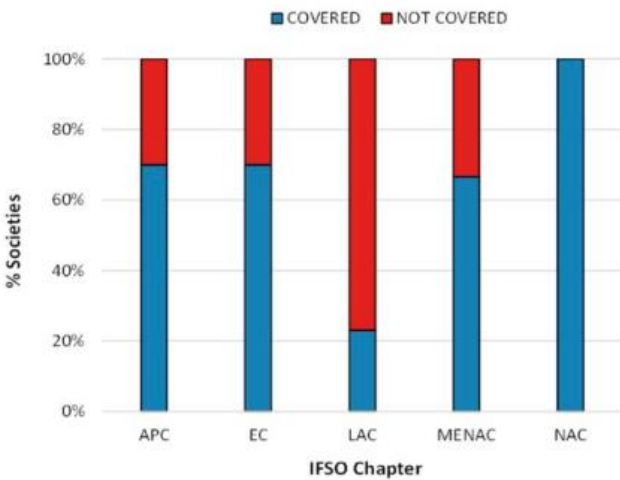
reported some coverage, with regional disparities

Take-home: Pediatric MBS remains highly variable worldwide → greater standardization and equitable access are needed.

Global Variability in Children and Adolescent Metabolic Bariatric Surgery Guidelines: A Worldwide IFSO Survey

Juan Pujol-Rafols¹ · Daniel M. Felsenreich² · Júlia Carmona-Maurici³ · Gerhard Prager² · Ricardo V. Cohen⁴ · Natan Zundel⁵ · Chetan Parmar⁶ · Aayed Alqahtani⁷ · Catalin Copaesescu⁸ · Pablo Omelanczuk⁹ · Jacques Himpens¹⁰ · Torsten Olbers¹¹ · Sjaak Pouwels^{12,13} · Scott A. Shikora¹⁴ · Nicola Di Lorenzo¹⁵ · Maurizio de Luca¹⁶ · Sylvia Weiner¹⁷ · Manuela Mazzarella¹⁸ · Stefanie D'Arco¹⁸ · Luigi Angrisani¹⁹ · Ozlem Uyanik²⁰ · Eva Pardina³ · Jose M. Balibrea^{21,22}

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Eligibility Criteria for Pediatric Bariatric Surgery

Defining Patient Selection Based on Clinical and

Pediatric Metabolic and Bariatric Surgery: Evidence, Barriers, and Best Practices

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Vicki M. Daichard, MD, MBA, EAAP, EAPOS^d SECTION ON OBESITY SECTION ON CHILDREN

DEDICATED TO THE HEALTH OF ALL CHILDREN™

Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity

Overweight and obesity management

NICE guideline
Published: 14 January 2025

Society

Criteria

IFSO/ ASMBS (2022)

- No lower age limit
- BMI ≥ 35 + major comorbidity
- BMI > 40

American Academy of Pediatrics (AAP; 2023)

- ≥ 13 years
- Similar to IFSO/ASMBS

National Institute for Health & Care Excellence (NICE) 2025

- Similar to IFSO/ ASMBS

National Board of Health and Welfare (2023)

- BMI ≥ 35 kg/m²
- ≥ 15 years



First, the case for surgery — our own ten-year data



Ten-Year Outcomes of Children and Adolescents Who Underwent Sleeve Gastrectomy: Weight Loss, Comorbidity Resolution, Adverse Events, and Growth Velocity

Aayed R Alqahtani, MD, FRCSC, Mohamed Elahmedi, MBBS, Hanan Y Abdurabu, MBBS, Sultan Alqahtani, MD

2,504 children and adolescents with class II/III obesity,,

71.1%

excess weight loss maintained at 7–10 years (n = 632)

74%

complete remission of type 2 diabetes at long-term follow-up

0.0

mean height z-score change — growth entirely unaltered

1%

adverse events (n = 27), with no procedure-related mortality

This is the strongest long-term adolescent surgical dataset in the world, and it is ours. Any argument I make for endoluminal therapy has to survive it.

Adolescents first does not mean endoscopy instead of surgery.

It means treating earlier, with the least irreversible tool that works, in the patient with the longest horizon — because in adolescents the real comparator is not surgery. **It is no treatment at all.**

I am not arguing

That endoluminal therapy replaces sleeve gastrectomy in the adolescent with class III obesity and established comorbidity. It does not, and our own ten-year data says so.

I am arguing

Adolescent who will never accept, never be offered, or never reach an operation is the patient endoluminal therapy was built for.

The comparator is not surgery. It is **nothing**.

Prevalence of Adolescents Meeting Criteria for Metabolic and Bariatric Surgery

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American Academy of Pediatrics

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Eligibility has been broadened. Delivery has not followed.

4.4%

of 603,041 adolescents aged 13–17 met criteria for metabolic and bariatric surgery — around one million US teenagers.

1,349

adolescent bariatric procedures performed in the United States in 2021 — against more than 200,000 in adults.

22.2%

of that same adolescent population had obesity: 12.9% class I, 5.4% class II, 3.9% class III.

Roughly one in a thousand eligible adolescents is treated surgically.

The debate we keep having — endoscopy versus surgery — is a debate about the treated fraction. For the other 999, the choice is between an endoluminal option and nothing. That is the comparison this talk is about.

OverStitch Endoscopic Sleeve Gastroplasty (ESG)

- Full-thickness endoscopic suturing system (OverStitch, Apollo EndoSurgery)
- Procedure aims to give the stomach a sleeve-like configuration



ORIGINAL ARTICLE

GIE
Gastrointestinal Endoscopy

Short-term outcomes of endoscopic sleeve gastroplasty in 1000 consecutive patients

Aayed Alqahtani, MD, FRCSC, FACS, Abdullah Al-Darwish, MD, Ahmed Elsayed Mahmoud, MD, Yara A. Alqahtani, MD, Mohamed Elahmedi, MBBS

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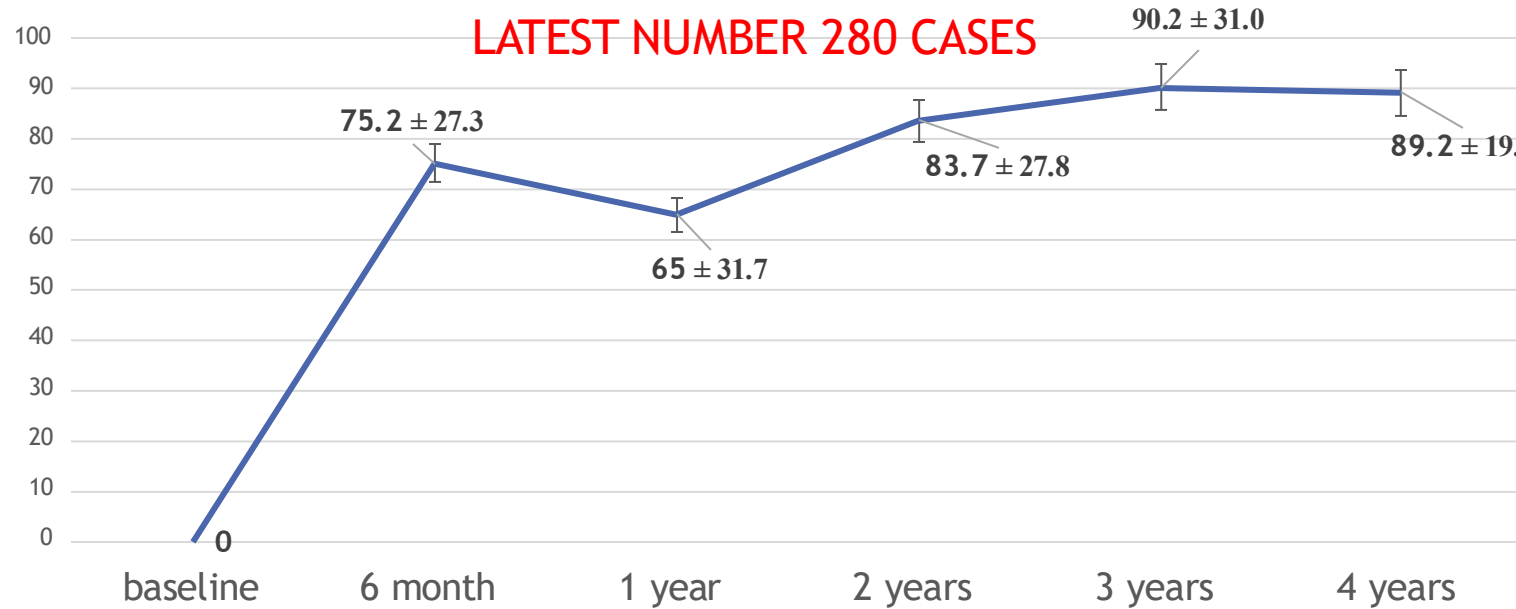
ESG Results in Pediatric Patients



%EWL After ESG in A Cohort of **280** Children and Adolescents

06/07/2024

LATEST NUMBER 280 CASES



Endoscopic Sleeve Gastroplasty in 109 Consecutive Children and Adolescents With Obesity: Two-Year Outcomes of a New Modality

Aayed Alqahtani, MD, FRCSC, FACS¹, Mohamed Elahmedi, MBBS¹, Yara A. Alqahtani, MD¹ and Abdullah Al-Darwish, MD¹

OBJECTIVES:

Endoscopic sleeve gastroplasty (ESG) uses full-thickness sutures that restrict the stomach to a sleeve-like configuration. There is no published evidence on endoscopic tissue apposition techniques in pediatric patients. In this article, we report our ESG experience with the first 109 pediatric patients with obesity who underwent ESG under our care.

METHODS:

ESG was offered as a day-case procedure under a standardized protocol and clinical pathway that included surgical, medical, and endoscopic modalities for the treatment of pediatric and adult obesity. ClinicalTrials.gov Identifier: NCT03778697.

RESULTS:

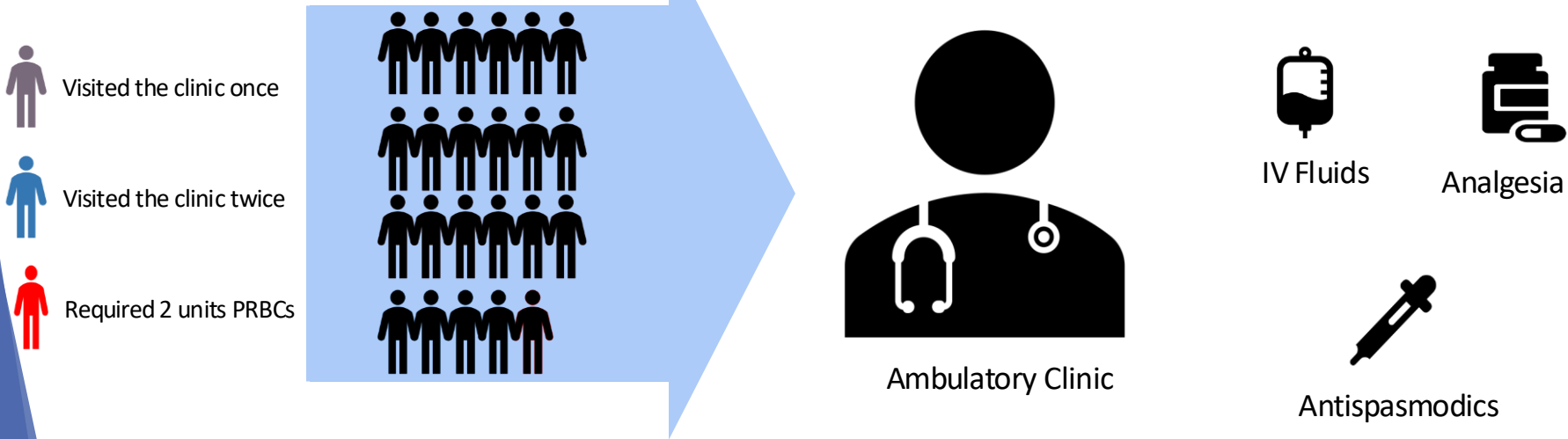
The 109 patients in this study had a baseline body mass index and age of 33.0 ± 4.7 and 17.6 ± 2.2 (range: 10–21) years, respectively. Ninety-nine (90.8%) were females. The mean procedure time was 61 ± 19 minutes. The mean % total weight loss at 6, 12, 18, and 24 months was $14.4\% \pm 6.5\%$, $16.2\% \pm 8.3\%$, $15.4\% \pm 9.2\%$, and $13.7\% \pm 8.0\%$, respectively. Fourteen adolescents visited the ambulatory clinic for analgesia. One patient (aged 19.8 years) requested removal of endoscopic stitches due to abdominal pain, and another underwent Redo-ESG for insufficient weight loss. There were no blood transfusions, emergency admissions, mortality, or significant morbidity.

DISCUSSION:

In this first study to date on ESG in pediatric patients, we observed that the procedure is safe and effective in children and adolescents with obesity. Significant weight loss occurs during the first 2 years without mortality or significant morbidity, and this weight loss seems to be maintained.

ESG Results in Pediatric Patients

14 patients visited the ambulatory clinic



No mortality

No unplanned admission

No significant morbidity

Endoscopic Sleeve Gastropasty in 109 Consecutive Children and Adolescents With Obesity: Two-Year Outcomes of a New Modality

Aayed Alqahtani, MD, FRCSC, FACS¹, Mohamed Elahmedi, MBBS¹, Yara A. Alqahtani, MD¹ and Abdullah Al-Darwish, MD¹



Technical Tips ESG in Paediatric and Adolescents

No major differences when comparing the technique in pediatric and adult age groups.

No technical difficulties with the GIF-2TH 180 (12.3 mm) double-channel gastroscope from Olympus

Overtube insertion should be done smoothly and without any resistance.

CO₂ insufflation should be kept to a minimum, and the helix should be rotated no more than 1 ½ times to pull the gastric wall in younger age groups.

Adolescents Are Not Small Adults

5 reasons that change the equation

01

A 60-year horizon

A decision made at 15 may have consequences for decades.

02

Growth & bone accrual

Surgery occurs during peak bone mineral accrual and residual growth.

03

Early but irreversible comorbidity

T2D, fatty liver and hypertension may begin early.

04

Shared consent

Decision-making involves the adolescent, family and clinical team.

05

Adherence is developmental

Long-term supplements and follow-up are harder at this age.



Key point: Pediatric bariatric decisions require a lifelong, developmental perspective.

These were not the same patients. That is the argument, not a limitation of it.

The surgical cohort

2,504 patients

Class II and III obesity. Established comorbidity. Referred, accepted, and reached an operating room.

The endoluminal cohort

278 patients

Mean BMI 33. Largely comorbidity-light. Many would not have been offered surgery — and many would have refused it.

Endoluminal therapy did not take patients from the surgical programme. It reached a population the surgical programme never saw.

The case for going endoluminal first

Five arguments that are specific to adolescence, not generic to endoscopy.

1 Anatomy is preserved



Nothing is resected and nothing is bypassed. Every future option — medical, endoscopic or surgical — remains fully available.

2

No permanent malabsorption



3

It does not burn the bridge



Sleeve gastrectomy after ESG is technically feasible and safe in our hands — escalation remains a planned step.

4

A lower decisional threshold



A day-case, incisionless, reversible-in-principle procedure is acceptable to families who will not consent to resection.

5

It treats the untreated



The class I and low class II adolescent is where prevalence is highest and where no intervention currently exists at scale.

The incretin question — competitor or partner?

4 anti-obesity medications are approved from age 12 — the field has changed.

WHAT THE TRIALS SHOW



Greater weight loss

STEP TEENS: BMI -16.1% vs +0.6%



Strong effect size

Approaches early endoscopic outcomes



Still unresolved

Duration • cost • discontinuation

WHERE ENDOLUMINAL FITS



Durability step

When indefinite medication is difficult



After discontinuation

Addresses rebound and weight regain



Combination, not competition

Mechanical + appetite-directed therapy

Take-home: incretins and endoluminal therapy may be partners, not competitors.

More Data is Required

1 No randomised evidence

There is no randomised trial of endoluminal therapy in adolescents. MERIT was an adult trial. We are extrapolating.

2 Durability Need more Data

Our adolescent data stops at 5 years.

3 No body composition or bone data

In a growing skeleton, we should be reporting lean mass and bone mineral density. We are not.

4 The programme is a confounder

Our patients sat inside a family-based multidisciplinary pathway. How much of the effect is the suture and how much the programme?

So who gets what?

A defensible allocation, given what we currently know.

- | | | |
|---|---|---|
| 1 | Class III, or class II with comorbidity | Metabolic bariatric surgery remains the standard of care. Do not substitute an endoscopic procedure for an indicated operation. |
| 2 | Class I to low class II, comorbidity-light | Endoluminal therapy first, inside a multidisciplinary programme, with pharmacotherapy as an adjunct where indicated. |
| 3 | Surgery indicated but declined or unavailable | Endoluminal therapy is the treatment, not a compromise. Untreated severe obesity is the worse outcome. |
| 4 | Insufficient response or recurrent weight gain | Escalate on a pre-defined ladder: repeat endoscopic therapy, add pharmacotherapy, or proceed to surgery. |

Every one of these routes belongs to the same programme, the same team, and the same registry.

What the field must produce by 2030

Four studies that would settle this question properly.

1

A randomised trial

Endoluminal therapy versus intensive lifestyle and pharmacotherapy in class I and II adolescents. The trial MERIT was for adults.

2

Five- and ten-year adolescent data

Durability, revision rate and comorbidity trajectory in the age group where the horizon actually matters.

3

Body composition and bone

Lean mass and bone mineral density reported as primary outcomes in a growing skeleton, across all three modalities.

4

Combination protocols

Prospective evaluation of endoluminal therapy with incretin therapy, including planned discontinuation.

IFSO, ASMBS and the paediatric societies should agree common adolescent endpoints before the next wave of devices arrives.

Conclusion

Yes — treat them earlier, and reach for A reversible option that works.

1

Not a replacement

Surgery remains the standard for severe adolescent obesity. Our own ten-year data proves it.

2

A different patient

Endoluminal therapy reaches the adolescent who is currently offered nothing at all.

3

Preserve the future

At fifteen, keeping every option open is itself a clinical outcome.



4th IFSO MENAC Meeting

3-5 December 2026

Gulf Convention Hotel, Manama, Bahrain

Registrations are Open



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