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# XXIX IFSO World Congress

1-4 September 2026 | Toronto, Canada

## *Identify Patients at Risk for Recurrent Weight Gain After Sleeve Gastrectomy*

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TORONTO 2026

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

ifso2026.org

# Disclosure Slide



| | |
|---|---|
| V | No, nothing to disclose |
| | Yes, please specify: |

| *Company Name* | *Honoraria/ Expenses* | *Consulting/ Advisory Board* | *Funded Research* | *Royalties/ Patent* | *Stock Options* | *Ownership / Equity Position* | *Employee* | *Other (please specify)* |
|---|---|---|---|---|---|---|---|---|
| Example: company XYZ | x | | x | | x | | | |
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BACKGROUND

# Current Mainstream Bariatric Surgeries

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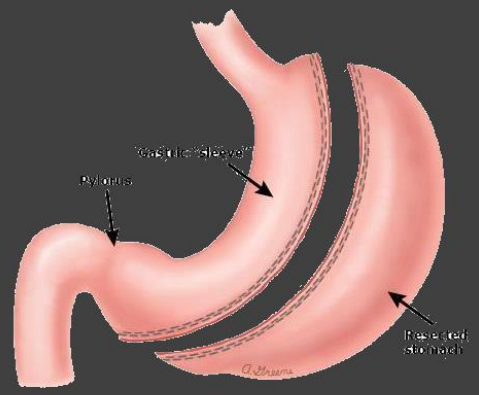
## Laparoscopic Sleeve Gastrectomy (LSG)

Most Frequently about **53 to 60 %**

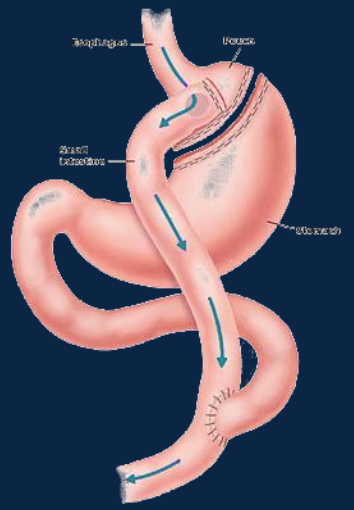


**~25%**
Weight loss at 12 months

**1–9%**
Leak / stenosis rate

## Roux-en-Y Gastric Bypass (RYGB)

Second most about **17 to 30%**



**~30%**
Weight loss at 12 months

**2.5–5%**
Marginal ulceration rate

Introduction

# Study Focus: Weight Regain After Bariatric Surgery

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PREVALENCE

**30-70%**

of patients experience weight regain (WR) after bariatric surgery

**2–5 years**

of patients regain >25% of total weight lost, typically within 2–5 years post-surgery

## COMORBIDITY RECURRENCE

- **Diabetes Progression**
  RR 1.36–1.64 across weight-regain measures
  (e.g., ≥10 kg, ≥5 BMI points, ≥20% of maximum weight lost)
- **Hyperlipidemia Progression**
  Significantly associated with weight in kg and BMI-based regain measures
- **Hypertension Progression**
  RR 1.16–1.28 across continuous and threshold weight-regain measures
- **Quality-of-Life & Satisfaction Decline**
  Physical/mental health-related QoL and surgical satisfaction worsen as regain increases

# Recurrent Weight Gain (RWG): Definition & Clinical Impact

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## No Standardized Definition

- **No consensus metric** — Reported weight regain varies widely across studies
- **Nadir Weight** (≥10% / 20%, / 25%)
- **Total / Excess BW Loss** ( ≥10% / 20% / 25%)
- **BMI change /Absolute weight** (> 5 BMI / > 10 kg)

## RWG Threshold and Comorbidity Progression (% of Total Body Weight Loss)

**Total BW Loss ≥ 20%**

**Hypertension & dyslipidemia progression significant**

## In Our Study : 12-Month BW vs. Nadir

Mean difference, **1.56 kg**
12-month vs. 2-year nadir weight

Mean difference, **1.5%**
Patients classified differently

METHODS

# Study Design & Patient Selection

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**Design:** Single-center retrospective cohort study

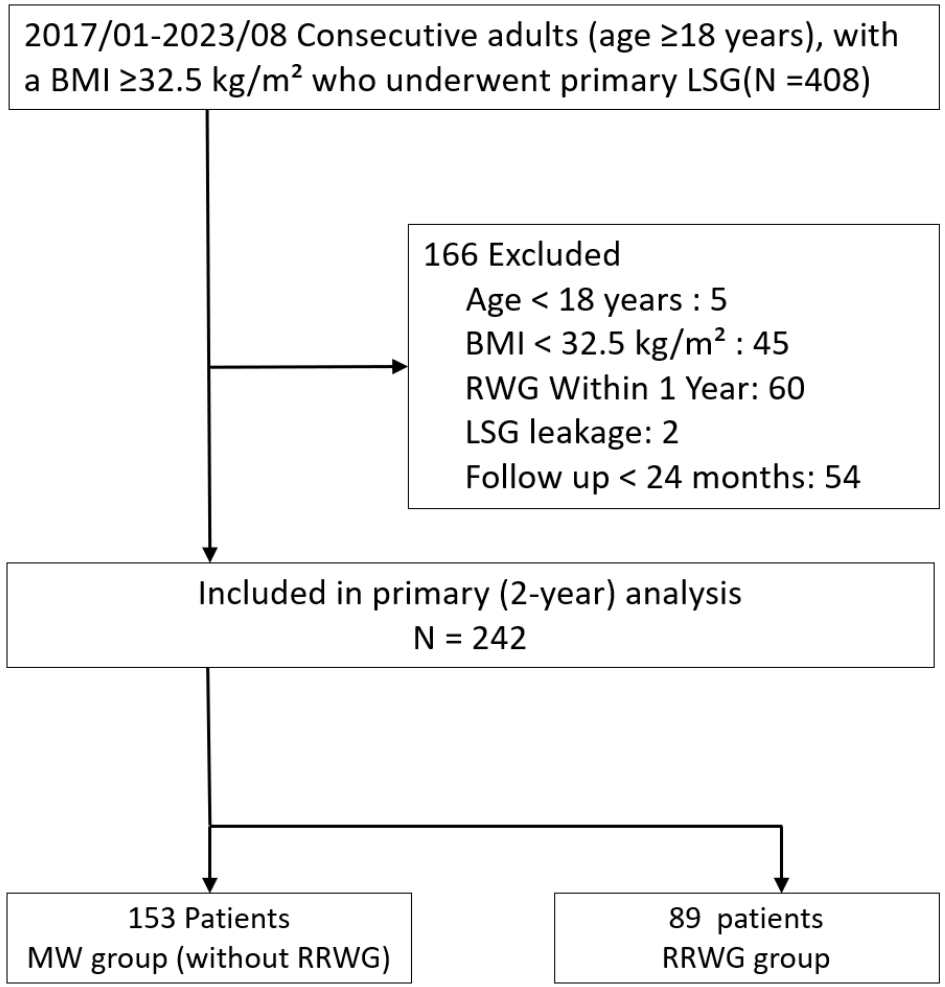
LSG in **2017-2023** by two bariatric surgeons.

## Inclusion Criteria

- Adults aged ≥18 years
- Preoperative BMI > 32.5 kg/m²
- Primary laparoscopic sleeve gastrectomy (LSG)

## Exclusion Criteria

- Unavailable 12-month weight data (n = 60)
- Postoperative staple-line leakage (n = 2)
- Follow-up duration < 24 months (n = 54)




RRWG defined as a ≥20% increase from the weight loss 1 year postoperatively, assessed at 2 years.

**Fig 1:** Study Algorithms

RESULTS

# Patient Characteristics (N = 242)

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| | | |
|---|---|---|
| **39.5 y** | **49.6 : 50.4%** | **39.3** |
| Median age | Female / Male | Median BMI |
| **40.5%** | **57.4%** | **83.9%** |
| Type 2 diabetes | Dyslipidemia | Hypertension |

## Mental Health Screening

| | |
|---|---|
| Requiring routine psychiatric follow-up | **25.2%** (n = 61) |

## Preoperative Condition & Weight-Loss Effect at 12 Months

| | |
|---|---|
| **Median %TBWL** | **33.8%** |
| TBWL ≥ 25% achieved | **90.5%** |
| Median weight / BMI | **76.3 kg / 26.8** |
| Diabetes Remission | **65.31%** |
| Dyslipidemia | **48.20%** |
| Hypertension | **54.68%** |

RESULTS

# Maintained-Weight vs. Recurrent-Weight-Gain Groups

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**89 / 242 patients (36.8%)** developed RWG during a median follow-up of **37.0 months**

| | MW (n = 153) | RWG (n = 89) | p |
|---|---|---|---|
| **%TBWL at 6 months** | 29.23% | 26.94% | 0.022* |
| **%TBWL at 12 months** | 35.11% | 31.49% | <0.001* |
| **%EBWL at 6 months** | 63.08% | 61.18% | 0.911 |
| **%EBWL at 12 months** | 75.94% | 70.95% | 0.113 |
| **Bupropion / Contrave use, year 1** | 35.3% | 47.2% | 0.077 |
| **Preoperative triglycerides** | 155.0 mg/dL | 145.0 mg/dL | 0.110 |
| **Need Psychologic regular** | 21.57% | 31.46% | 0.094 |

RESULTS

# Three Independent Predictors of RWG

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1. **Univariate screen Logistic regression**; candidate variables retained at **$p \leq 0.2$**
2. **Collinearity check Variance inflation factor (VIF)** < 5 required for model entry
3. **Multivariable modeling Logistic regression + Cox Regression**
   - proportional hazards (backward stepwise); Schoenfeld residuals confirmed the PH assumption

**1**

**12-Month %TBWL**

**Adj HR 0.961** p = 0.041

+1% TBWL
→ RWG risk ↓ 3.9 %

**Optimal cutoff : ≤ 32.8%**

**2**

**Pre-Operative Triglycerides**

**Adj HR 0.997** p = 0.033

Paradox: + 1 mg/dL
→ RWG risk ↓ 0.3 %

**Optimal cutoff: ≤ 219 mg/dL**

**3**

**First-Year Emotional Medication Use**

**Adj HR 1.785** p = 0.008

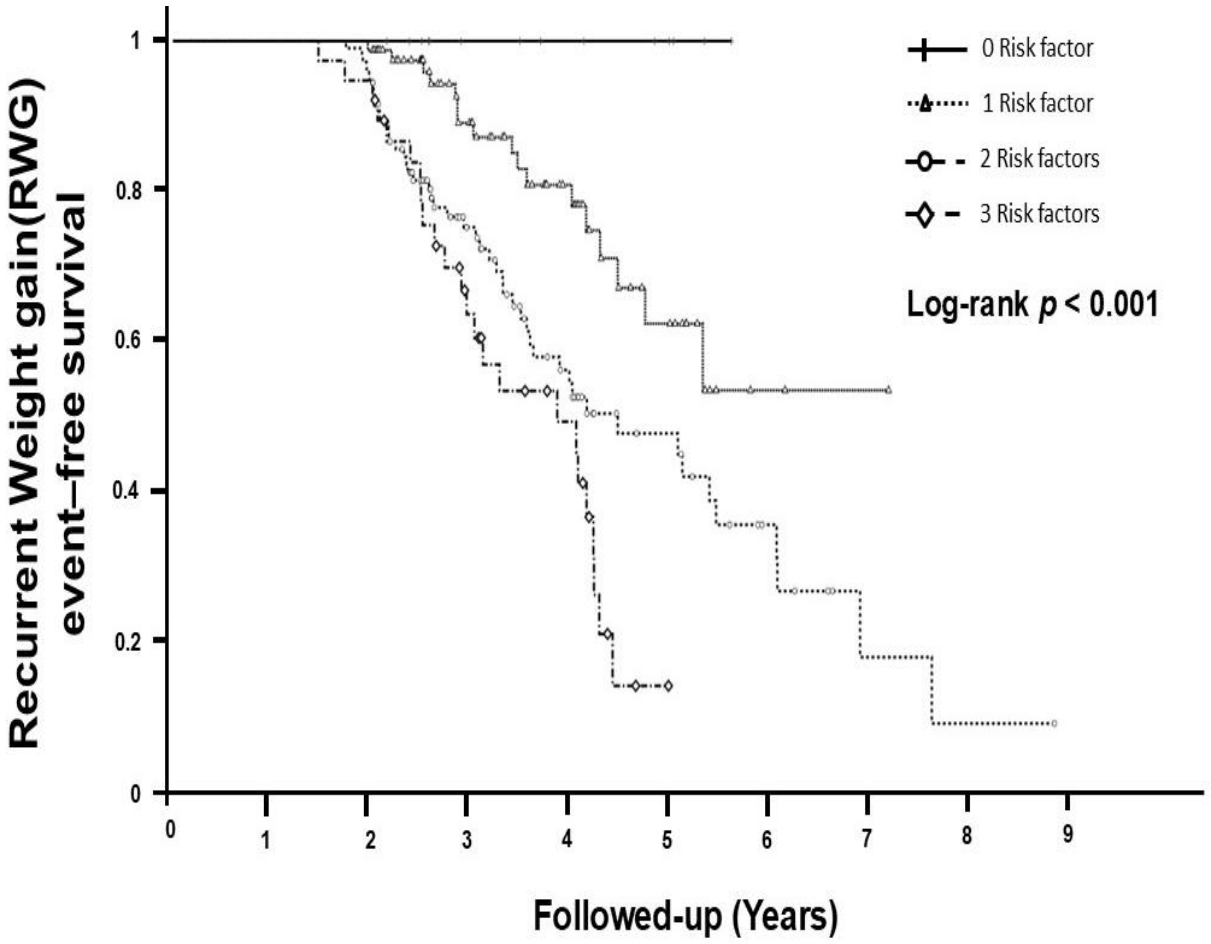
Users → RWG risk ↑ 78.5%

**Strongest predictor**

RESULTS

# Risk-Stratified RWG-Free Survival

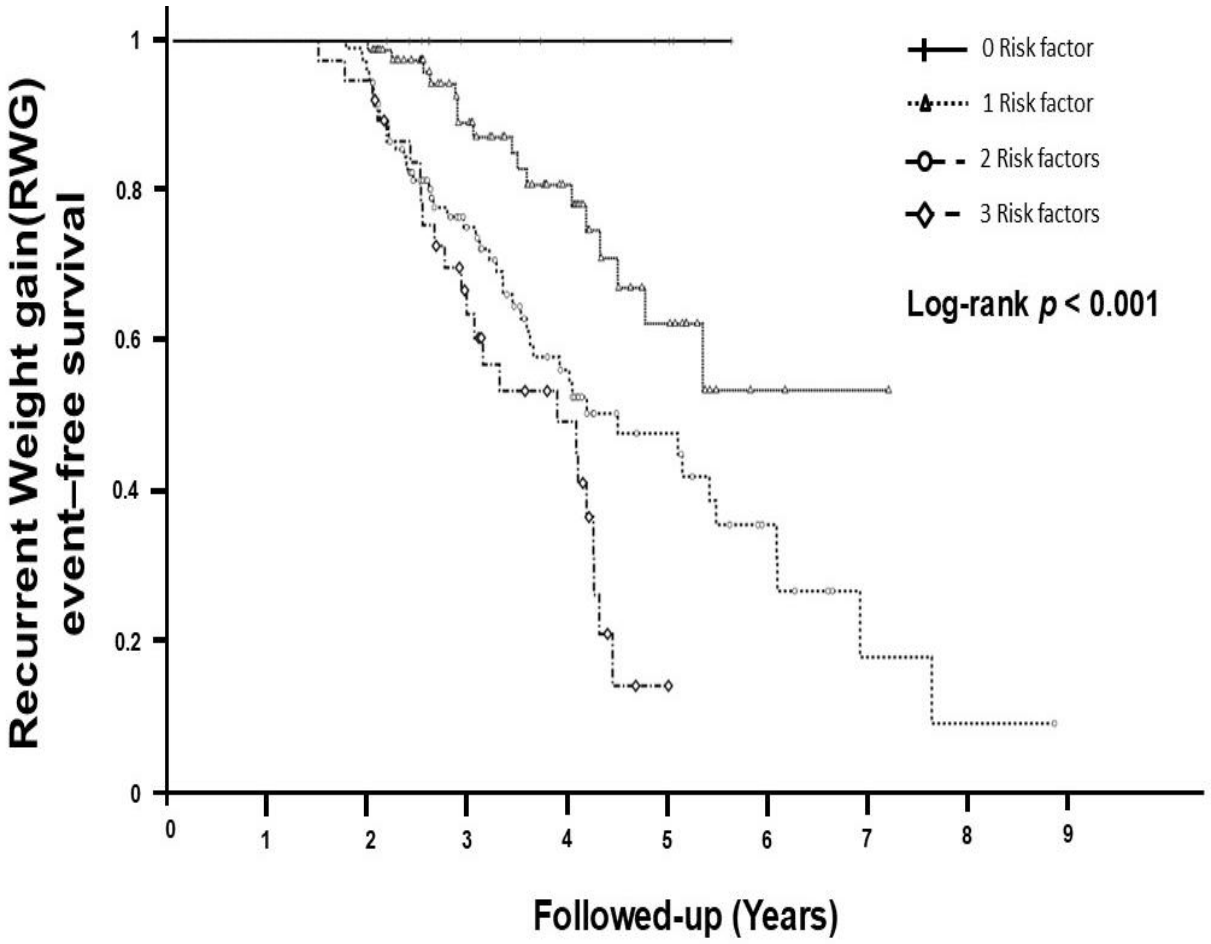





| | |
|---|---|
| 0 risk factors | **0.0%** (n = 14) |
| 1 risk factor | **20.7%** (n = 82) |
| 2 risk factors | **44.4%** (n = 108) |
| 3 risk factors | **63.2%** (n = 38) |

RESULTS

# Risk-Stratified RWG-Free Survival

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**Model Performance**

- Log-rank p < 0.001

HR 2.107 per one-point increase in risk count (p < 0.001)

C-statistic 0.700 (95% CI 0.633–0.766)

**Bootstrap-corrected C-statistic 0.654**

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# Beyond Risk Identification: Toward Risk-Stratified Care

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## An Oncology-Inspired Framework

### Cancer Staging
Stratifies patients by disease characteristics for treatment intensity

### Obesity Staging
Stratifies by metabolic profile & 1-yr response to guide MDT care

### Overall Survival
Time-to-event endpoint tracking disease recurrence

### RWG-Free Survival
Time-to-event endpoint tracking recurrent weight gain

### Individualized Rx
Surgery, chemo, or combination based on stage

### Tiered MDT Care
Surgery, pharmacotherapy (GLP-1 RA), or combination based on risk



Discussion

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| | | |
|---|---|---|
| 1 | 12-Month %TBWL | RWG risk ↑ 3.9 % |
| 2 | Pre-OP Triglycerides | RWG risk ↑ 0.3 % |
| 3 | 1st-Year Emotional Med Use | +78.5% risk<br>Increase in RWG risk |

### Risk factors: 0–1
**0–21%**
RWG incidence

**Routine Surveillance**

Standard postOP follow-up schedule

### Risk factors: 2
**44%**
RWG incidence

**Intensified Support**

behavioral / PSY follow-up;

### Risk factors: 3
**63%**
RWG incidence

**Combination Therapy**

Surgical +Med approach

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

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"Advancing Multimodal Obesity Care"

24-27 August 2027

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