

TWO-STEP 3-MONTH TRIAGE ALGORITHM FLAGS SUBOPTIMAL 12-MONTH WEIGHT LOSS AFTER RYGB

Using TWL3 and the 1–3 month weight-loss slope

Máximo A. Schiavone, MD · Camila Boff, MD · Gabriel Menaldi, MD · Nicolás Paleari, MD · Pedro Martínez Duartez, MD

Bariatric and Metabolic Surgery Unit · Hospital Universitario Austral · Pilar, Argentina

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DISCLOSURE

CONFLICTS OF INTEREST

Nothing to disclose

WHY EARLY TRIAGE?

The actionable window is before the 12-month outcome is already established.



CLINICAL QUESTION

Can weight-loss data available by month 3 identify individuals at risk of TWL12 <25%?

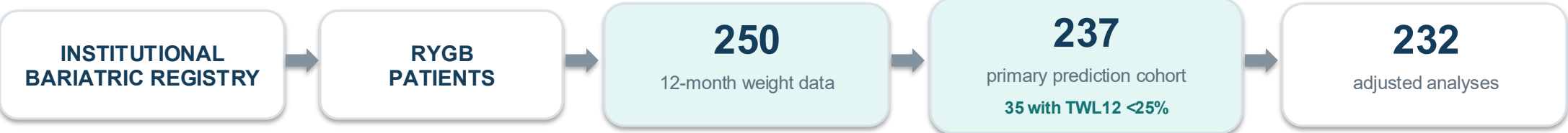
TWL3 = main early signal · Δ TWL1–3 = trajectory modifier

STUDY COHORT & ANALYTIC APPROACH

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Retrospective, single-center RYGB study

COHORT FLOW



PRIMARY ENDPOINT

TWL12 <25%

35 / 237 · 14.8%

Lower-than-expected weight loss at 12 months

MODELS & SIGNALS

BASILINE MODEL

Age + pre-op BMI
clinical factors

PRIMARY EARLY SIGNAL

+ TWL3
weight loss at month 3

TRAJECTORY SIGNAL

ΔTWL1–3
month 1 → month 3

Outcome modeled: TWL12 <25% · Adjusted analyses accounted for age and pre-op BMI

STATISTICAL METHODS

ROC/AUC · Youden index · logistic regression (robust HC3) · 5-fold cross-validation

TWL3 = total weight loss at month 3 · ΔTWL1–3 = change in TWL from month 1 to month 3

RESULT 1

TWL3 PREDICTS 12-MONTH RISK

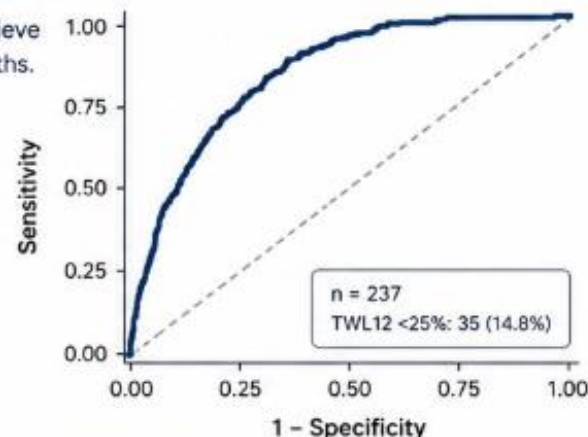
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From discrimination to practical thresholds to clinically distinct risk zones

1 DISCRIMINATION: ROC ANALYSIS

TWL3 discriminates patients who will achieve less than 25% total weight loss at 12 months.

AUC
0.802
(95% CI 0.746–0.858)



2 THRESHOLD DERIVATION

Two thresholds were derived from the ROC curve to create actionable clinical cutoffs.



BALANCED THRESHOLD
(maximum Youden index)

16.19%

Helps
rule out risk



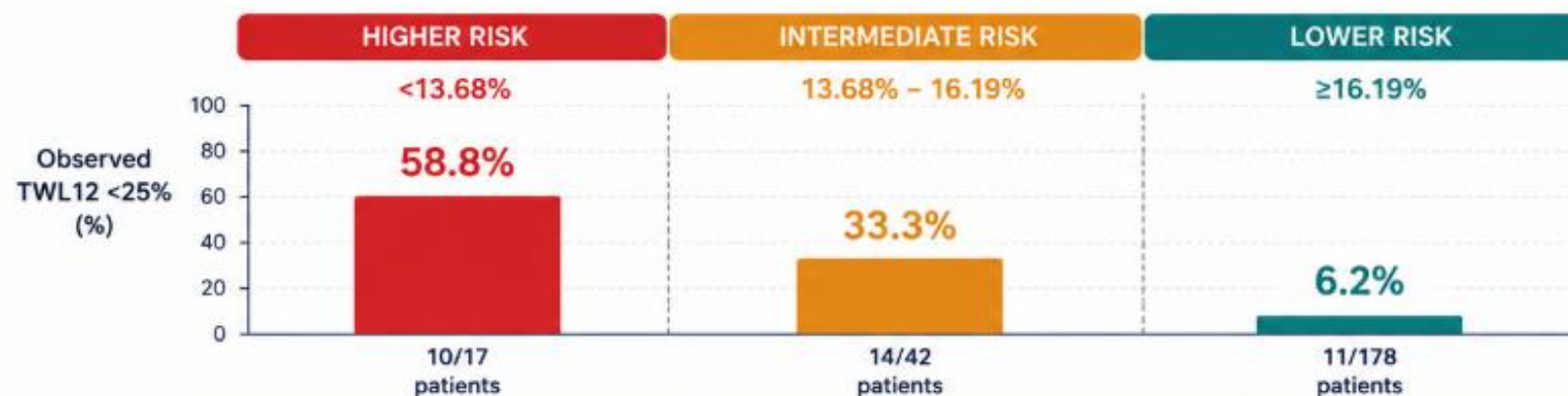
RULE-IN THRESHOLD
(maximum PPV with ≥ 10 positives)

13.68%

Identifies a
higher-risk
subgroup

3 THREE TWL3 ZONES AND OBSERVED 12-MONTH OUTCOMES

Applying the two thresholds separates patients into three clinically distinct risk zones with markedly different observed event rates.



RULE-IN ZONE
(<13.68%)

Specificity 96.5%



RULE-OUT ZONE
($\geq 16.19\%$)

NPV 93.8%

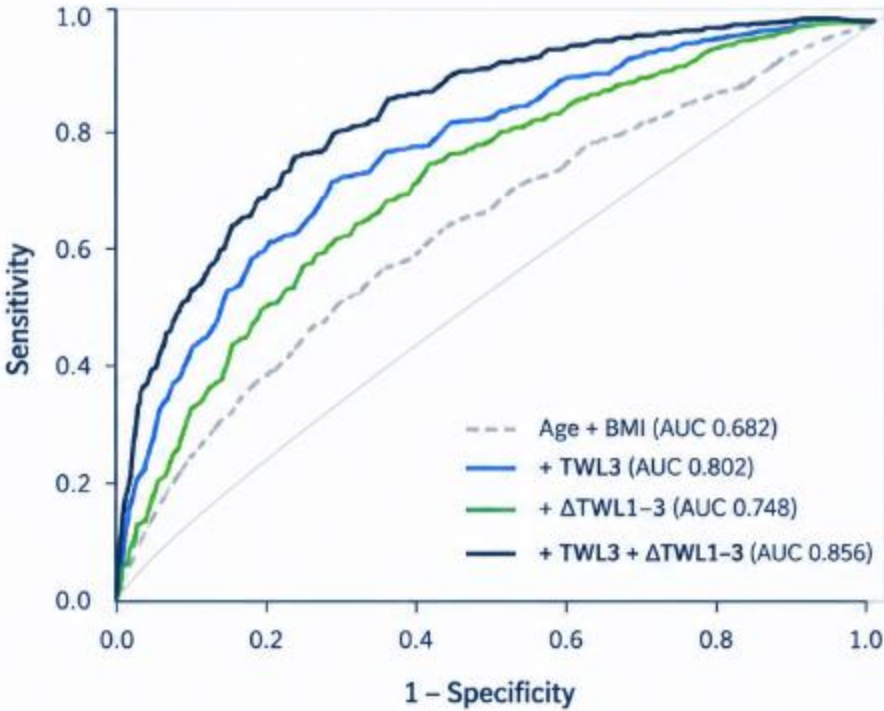


Observed risk of TWL12 <25% decreased sharply across TWL3 zones:
58.8% in higher-risk, **33.3%** in intermediate-risk, and **6.2%** in lower-risk.

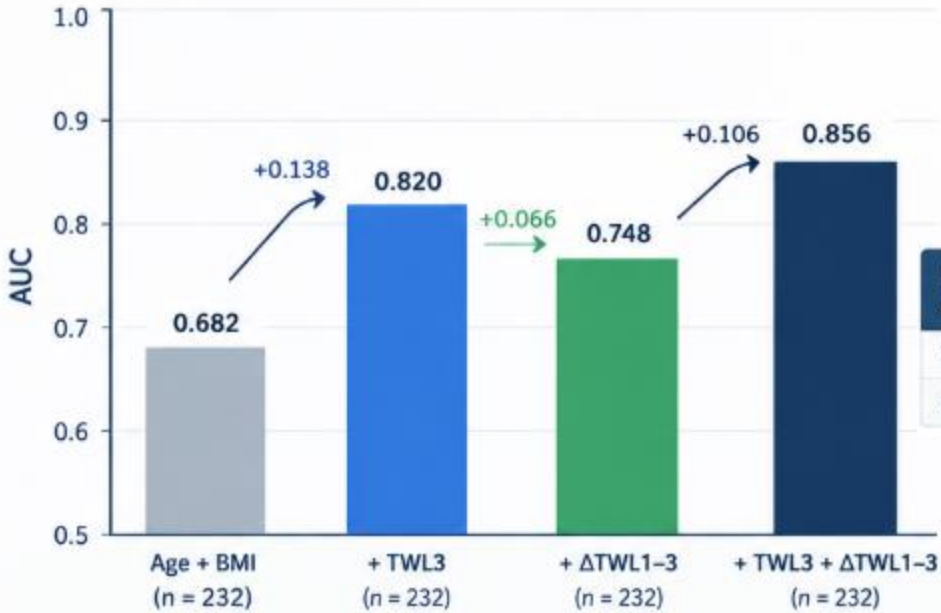
TWL3 and Δ TWL1-3 add complementary value

Each variable improves discrimination, with the best performance when both are included.

Incremental discrimination (ROC curves)



Incremental AUC (5-fold cross-validation)



Adjusted association (complete-case models)	OR (per +5 pp)
TWL3	0.20 (p<0.001)
Δ TWL1-3	0.22 (p<0.001)

TWL3 and Δ TWL1-3 provide complementary information, with the highest discriminatory performance when combined.



TWL3

Main early classifier

ROC AUC = 0.802
(n = 237, 35 events)



Δ TWL1-3

Adds independent value

Adjusted OR = 0.22 per +5 pp
(p < 0.001)



Combined model

Best discrimination

CV-AUC = 0.856
(age + BMI + TWL3 + Δ TWL1-3)

THE TWO-STEP 3-MONTH TRIAGE CONCEPT

A pragmatic triage framework — not a treatment mandate.

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AT 3 MONTHS: CHECK TWL3

HIGHER-RISK EXTREME

TWL3 <13.68%

58.8% observed event rate

Prioritize intensified
multidisciplinary follow-up
-
Adjunctive Pharmacotherapy?

INTERMEDIATE ZONE

13.68–16.19%

33.3% observed event rate

Use Δ TWL1–3 as a continuous
risk modifier
-
More intensified follow-up

LOWER-RISK EXTREME

TWL3 $\geq$ 16.19%

6.2% observed event rate

Standard follow-up is reasonable

TAKE-HOME MESSAGE

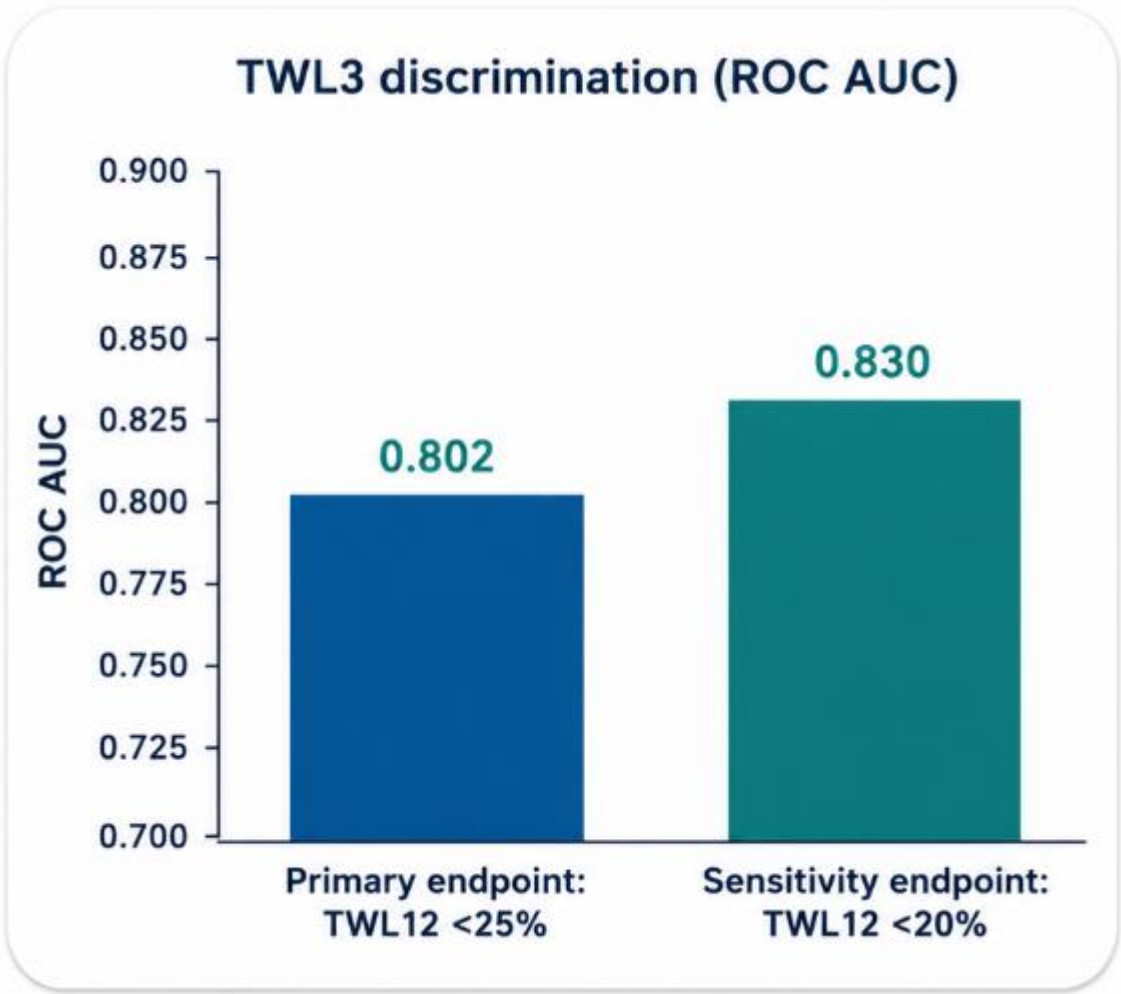
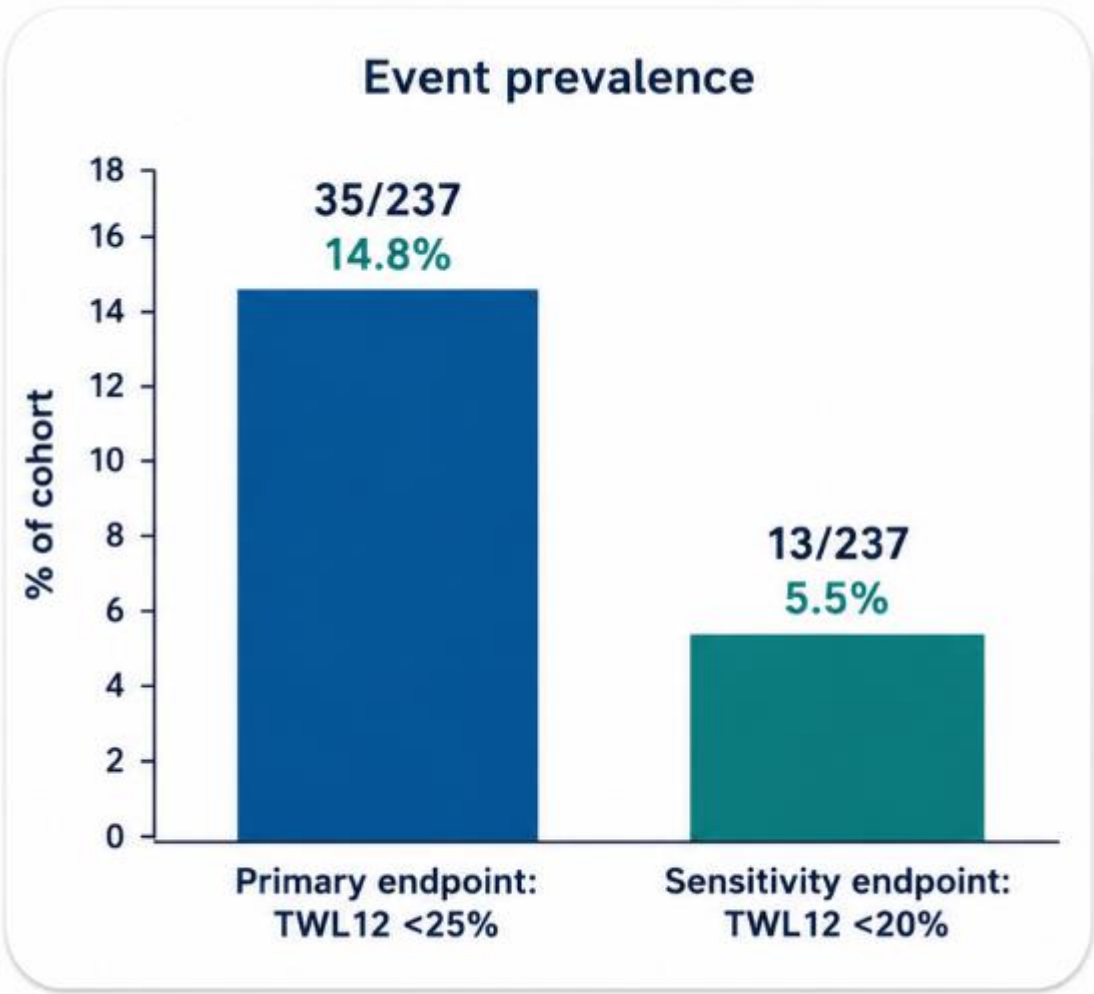
Three points to remember.

- 1 **TWL3 is a practical early triage marker after RYGB.**
- 2 **Two thresholds separate lower- and higher-risk extremes by month 3.**
- 3 **The 1–3 month trajectory can help prioritize the intermediate zone.**

LIMITATIONS

Retrospective · single center · 35 events · external validation required

TRIAGE TOOL, NOT A TREATMENT MANDATE



Endpoint	TWL12 <25%
TWL3 balanced threshold	Maximum Youden index
TWL3 rule-in threshold	Maximum PPV with ≥10 high-risk individuals
Adjusted models	Age + pre-op BMI · robust HC3 inference
Incremental discrimination	5-fold cross-validated AUC · complete-case
Near-flat slope signal	Δ TWL1–3 <1 pp · 4/4 events · hypothesis-generating