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9-12 September 2025
Santiago, Chile

Metabolic Surgery as Cancer Prevention Strategy Including Concurrent Onco Metabolic Surgery

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Obesity and Cancer

- Obesity pandemic: 640 million adults worldwide

- Obesity associated cancers (OACs):

Post-menopausal breast, colorectal, kidney, endometrial, thyroid, pancreas, liver, gastric cardia, meningioma, ovary, esophageal adenocarcinoma, gall bladder and myeloma

- CDC: 40% of cancers associated with Obesity and overweight



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The global burden of cancer attributable to risk factors, 2010–19: a systematic analysis for the Global Burden of Disease Study 2019

GBD 2019 Cancer Risk Factors Collaborators*



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Leading risk 2010	Age-standardised rate of DALYs, 2010	Leading risk 2019	Age-standardised rate of DALYs, 2019	Percentage change in age-standardised rate of DALYs, 2010–19
1 Smoking	774.1 (729.9 to 818.1)	1 Smoking	677.3 (616.4 to 740.3)	-12.5 (-19.6 to -4.8)
2 Alcohol use	164.4 (148.3 to 182.3)	2 Alcohol use	155.2 (138.4 to 173.5)	-5.6 (-12.9 to 2.2)
3 High body-mass index	127.9 (71.4 to 200.3)	3 High body-mass index	133.9 (76.2 to 206.8)	4.8 (-1.8 to 12.9)
4 Unsafe sex	112.6 (99.2 to 125.4)	4 Unsafe sex	107.2 (90.5 to 119.4)	-4.8 (-12.7 to 3.7)
5 High fasting plasma glucose	101.3 (27.4 to 207.0)	5 High fasting plasma glucose	104.2 (28.7 to 212.9)	2.9 (-2.8 to 9.5)
6 Ambient particulate matter pollution	86.3 (63.0 to 109.0)	6 Ambient particulate matter pollution	84.2 (62.1 to 108.3)	-2.4 (-12.5 to 10.1)
7 Occupational exposure to asbestos	61.1 (45.0 to 77.6)	7 Occupational exposure to asbestos	50.9 (37.8 to 64.7)	-16.7 (-21.8 to -11.5)
8 Diet low in whole grains	48.1 (18.4 to 63.0)	8 Diet low in whole grains	46.3 (17.8 to 61.1)	-3.6 (-9.1 to 1.9)
9 Diet low in milk	45.3 (29.4 to 61.2)	9 Diet low in milk	46.1 (29.8 to 62.2)	1.7 (-4.8 to 8.9)
10 Diet low in fruits	43.6 (22.1 to 68.7)	10 Second-hand smoke	38.5 (24.8 to 55.5)	-5.2 (-13.7 to 4.0)
11 Second-hand smoke	40.7 (26.6 to 57.9)	12 Diet low in fruits	36.0 (18.5 to 56.2)	-17.5 (-26.5 to -8.1)

■ Behavioural risks
■ Environmental and occupational risks
■ Metabolic risks



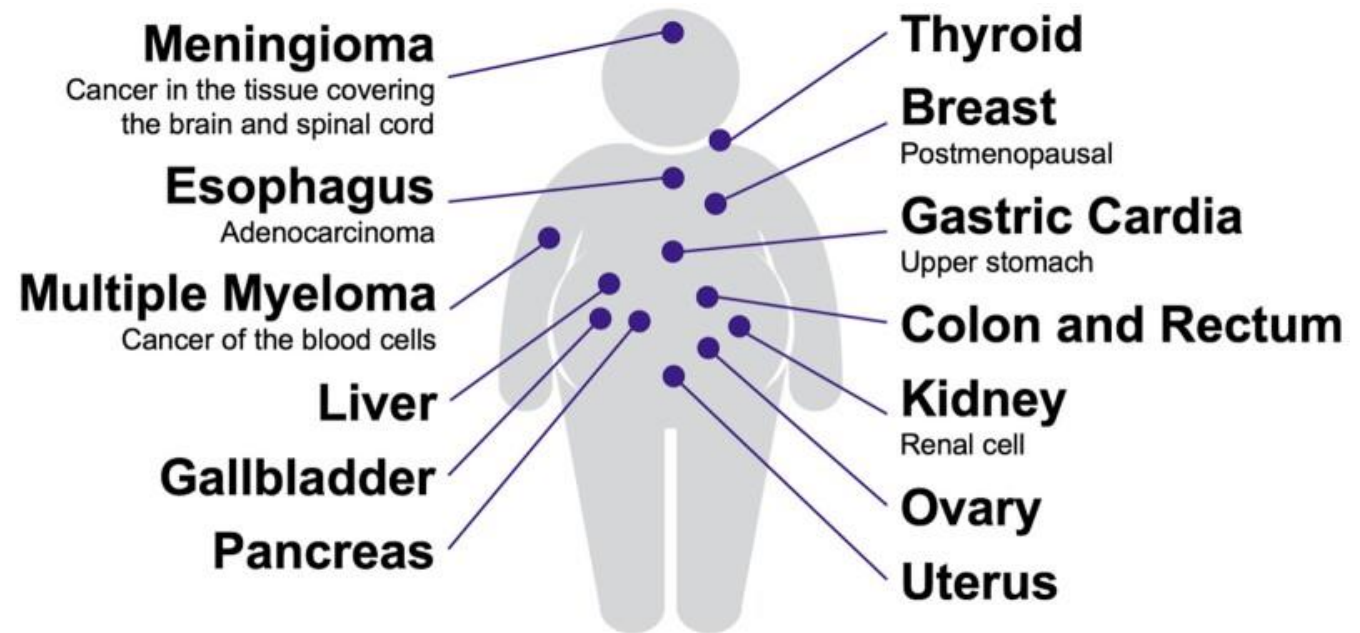
Metabolic Surgery as a Cancer Prevention Strategy



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- Recent evidence highlights its **potential role in cancer prevention**, beyond metabolic control.



13 cancers have been linked with obesity

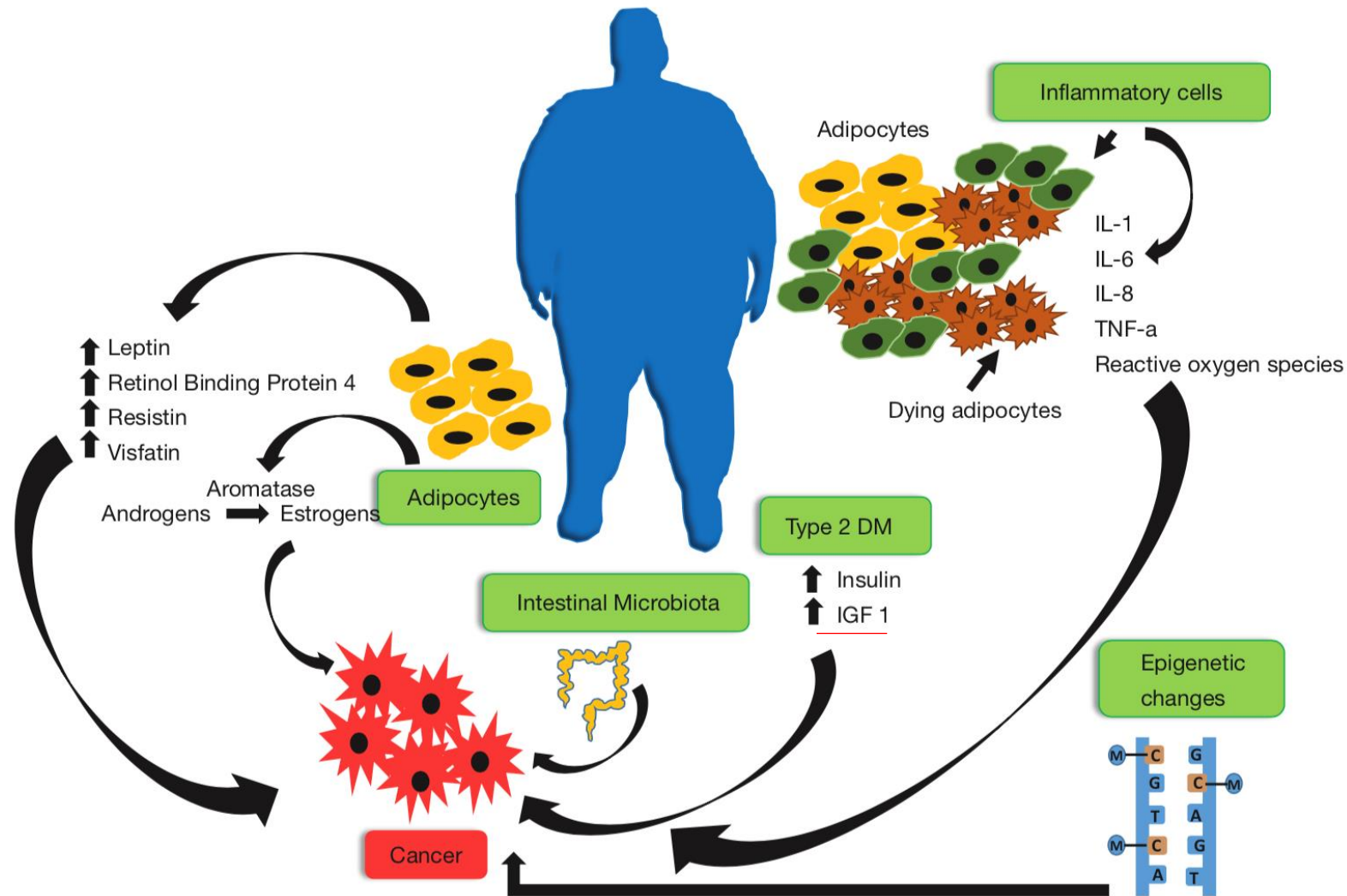


Mechanisms of cancer promotion by obesity



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Bariatric surgery to prevent cancer progression, recurrence and mortality

- Direct pathway:

Adipose tissue derived adipokines and cytokines which directly promote tumor growth and metabolites

- Indirect pathway:

T2DM with accompanying high levels of tumor promoters such as insulin and IGF-1



Metabolic Surgery as a Cancer Prevention Strategy



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- Hormonally driven cancers show the most robust protective effects.
 - **Breast**
 - **Endometrial**
 - **Ovarian**



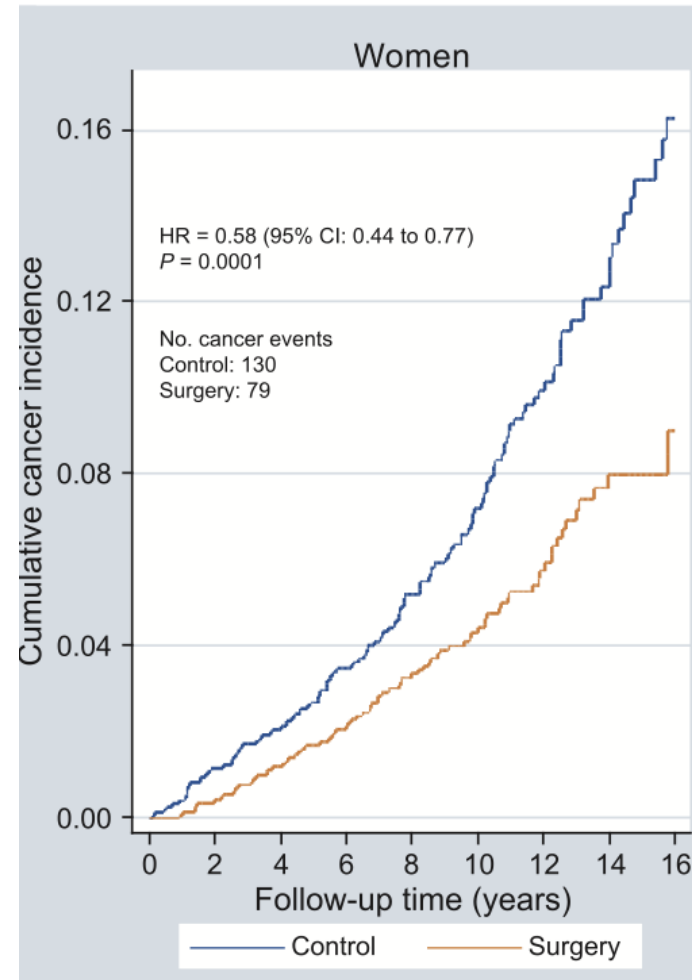
Clinical Impact of Bariatric Surgery on Cancer



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- The **Swedish Obese Subjects (SOS) Study** reported a **42% decrease in cancer incidence** post-MBS (HR 0.58).



Sjöström L. Review of the key results from the Swedish Obese Subjects (SOS) trial - a prospective controlled intervention study of bariatric surgery. J Intern Med. 2013 Mar;273(3):219-34.

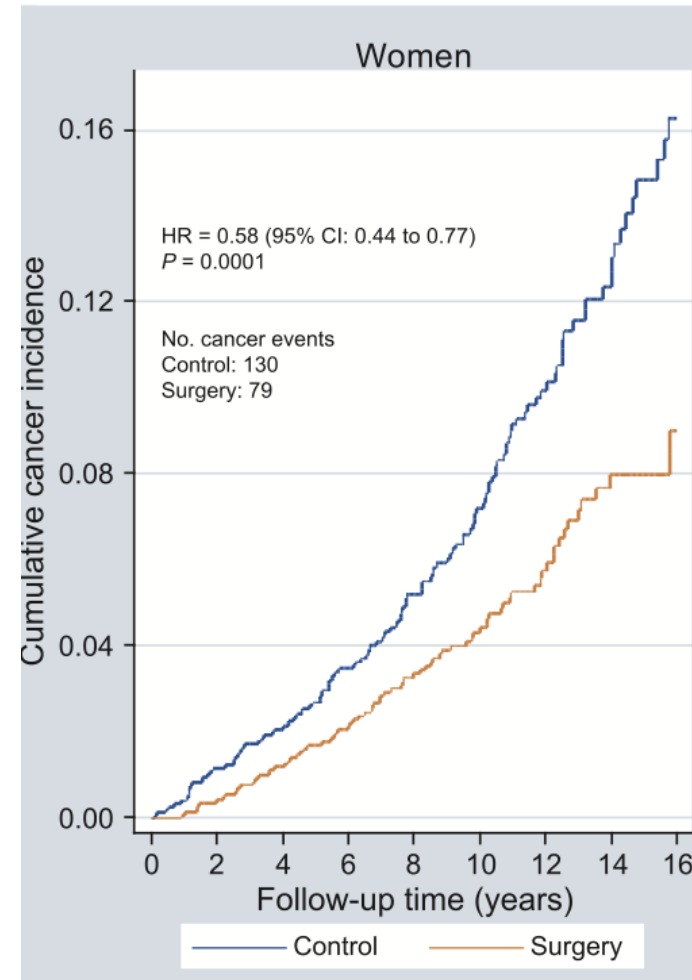
Clinical Impact of Bariatric Surgery on Cancer



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- Estimated reduction in cancer mortality **38,3%**.



Sjöström L. Review of the key results from the Swedish Obese Subjects (SOS) trial - a prospective controlled intervention study of bariatric surgery. J Intern Med. 2013 Mar;273(3):219-34.

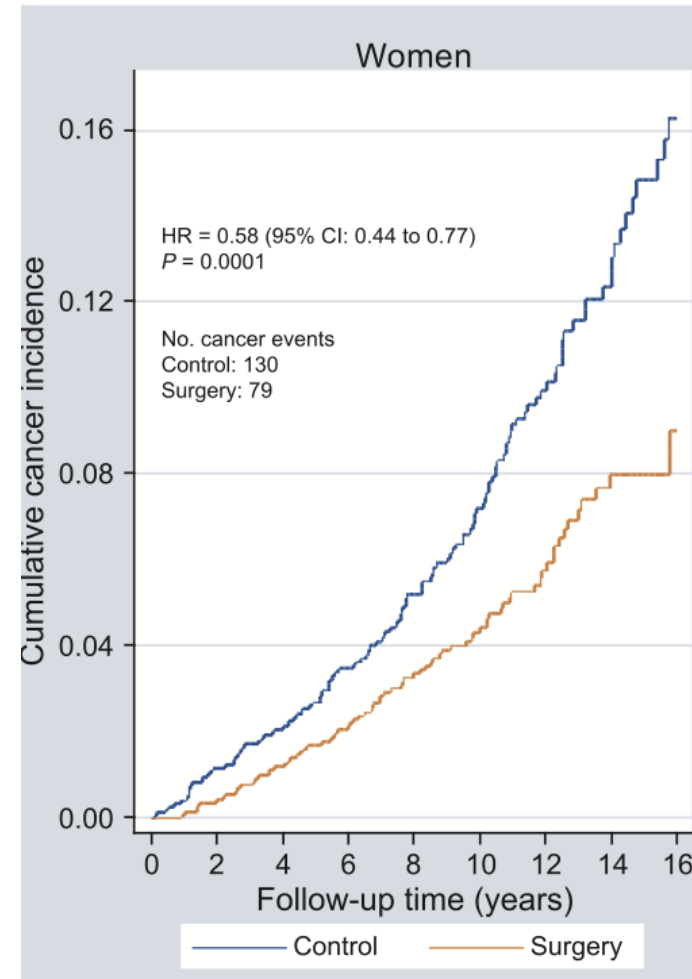
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- Cancer risk reduction appears to be:
 - **Sex-specific:** Greater in women
 - **Tumor-type dependent:** Stronger in hormonally influenced cancers



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JAMA | **Original Investigation**

Association of Bariatric Surgery With Cancer Risk and Mortality in Adults With Obesity

Ali Aminian, MD; Rickesha Wilson, MD; Abbas Al-Kurd, MD; Chao Tu, MS; Alex Milinovich, BA; Matthew Kroh, MD; Raul J. Rosenthal, MD; Stacy A. Brethauer, MD; Philip R. Schauer, MD; Michael W. Kattan, PhD; Justin C. Brown, PhD; Nathan A. Berger, MD; Jame Abraham, MD; Steven E. Nissen, MD

- Matched cohort study
- Bariatric surgery (n = 5053), including Roux-en-Y gastric bypass and sleeve gastrectomy, vs nonsurgical care (n = 25,265).



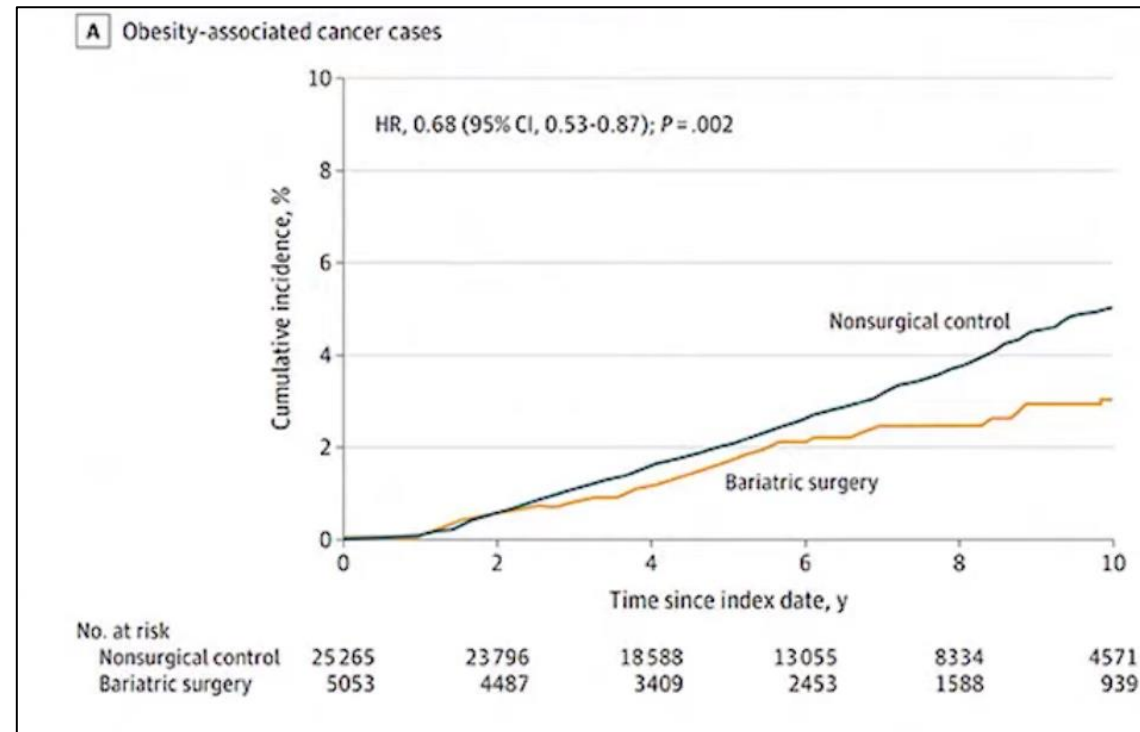
OACs



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- 3% reduction in OACs incidence

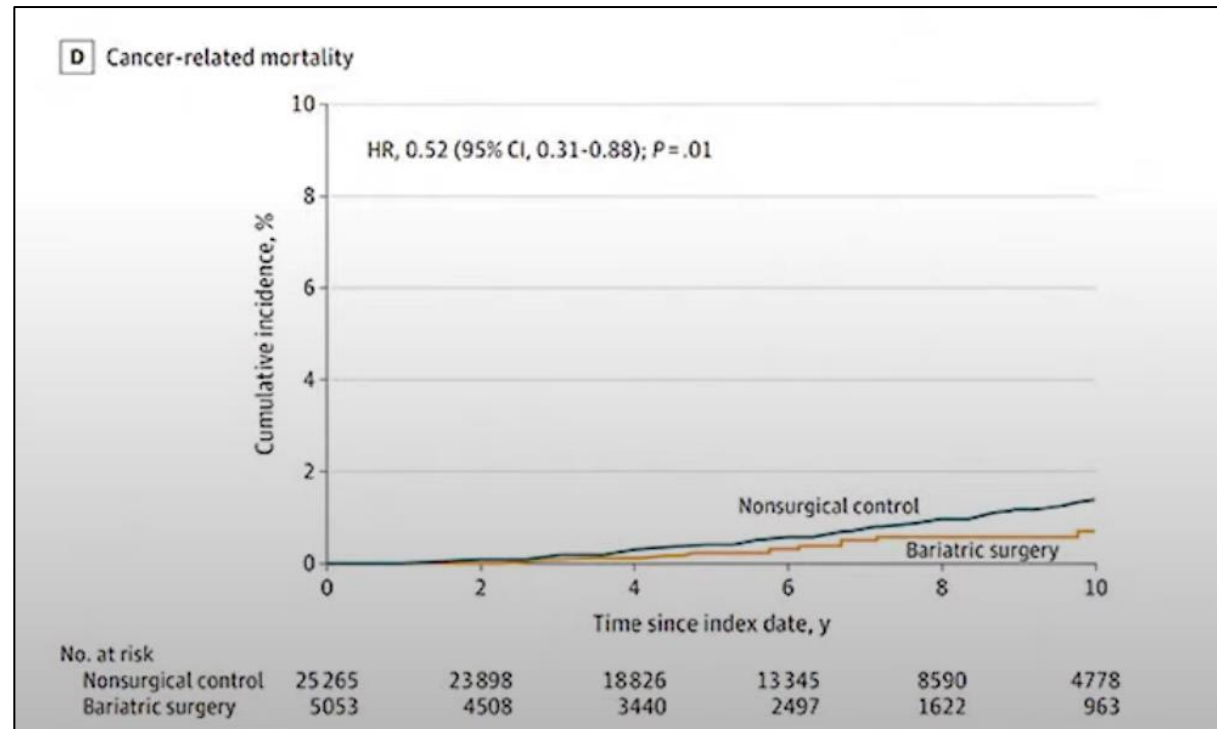


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Cancer-related mortality

- 50% reduction in cancer associated mortality





Review

Systematic Review and Meta-Analysis of the Impact of Bariatric Surgery on Future Cancer Risk

Robert B. Wilson ^{1,*} , Dhruvi Lathigara ² and Devesh Kaushal ²

- **Systematic review & meta-analysis** of 32 studies (2007–2023).
- **511,585 BS patients vs. 1,889,746 control.**
- Outcomes analyzed:
 - Total cancer incidence
 - Obesity-associated cancers (OACs)
 - Cancer-related mortality
 - Subgroup analyses by cancer type

Wilson, R.B., Lathigara, D., & Kaushal, D. (2023). *Systematic Review and Meta-Analysis of the Impact of Bariatric Surgery on Future Cancer Risk*. International Journal of Molecular Sciences, 24(6), 6192.



Review

Systematic Review and Meta-Analysis of the Impact of Bariatric Surgery on Future Cancer Risk

Robert B. Wilson ^{1,*} , Dhruvi Lathigara ² and Devesh Kaushal ²

KEY FINDINGS

- ✓ Reduced overall cancer incidence:
 - RR = 0.62; 95% CI: 0.46–0.84; $p = 0.002$
- ✓ Reduced incidence of OACs:
 - RR = 0.59; 95% CI: 0.39–0.90; $p = 0.01$
- ✓ Reduced cancer-related mortality:
 - RR = 0.51; 95% CI: 0.42–0.62; $p < 0.00001$

Wilson, R.B., Lathigara, D., & Kaushal, D. (2023). *Systematic Review and Meta-Analysis of the Impact of Bariatric Surgery on Future Cancer Risk*. International Journal of Molecular Sciences, 24(6), 6192.



Review

Systematic Review and Meta-Analysis of the Impact of Bariatric Surgery on Future Cancer Risk

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 Significant risk reduction in specific cancers:

Cancer Type	Relative Risk (RR)	Significance
Hepatocellular	0.35	✓
Colorectal	0.63	✓
Pancreatic	0.52	✓
Gallbladder	0.41	✓
Breast (female)	0.56	✓
Endometrial (female)	0.38	✓
Ovarian (female)	0.45	✓

 No significant effect on:

- Esophageal, gastric, thyroid, kidney, prostate cancer, multiple myeloma.

Wilson, R.B., Lathigara, D., & Kaushal, D. (2023). *Systematic Review and Meta-Analysis of the Impact of Bariatric Surgery on Future Cancer Risk*. International Journal of Molecular Sciences, 24(6), 6192.



Oncometabolic Surgery: Dual Approach for Cancer and Metabolic Disease



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- New paradigm: **Oncometabolic Surgery**
 - Combines **oncologic resection** with **metabolic benefits** in a single operation

- Applied in **gastric cancer patients** with comorbidities like obesity, diabetes, or hypertension.

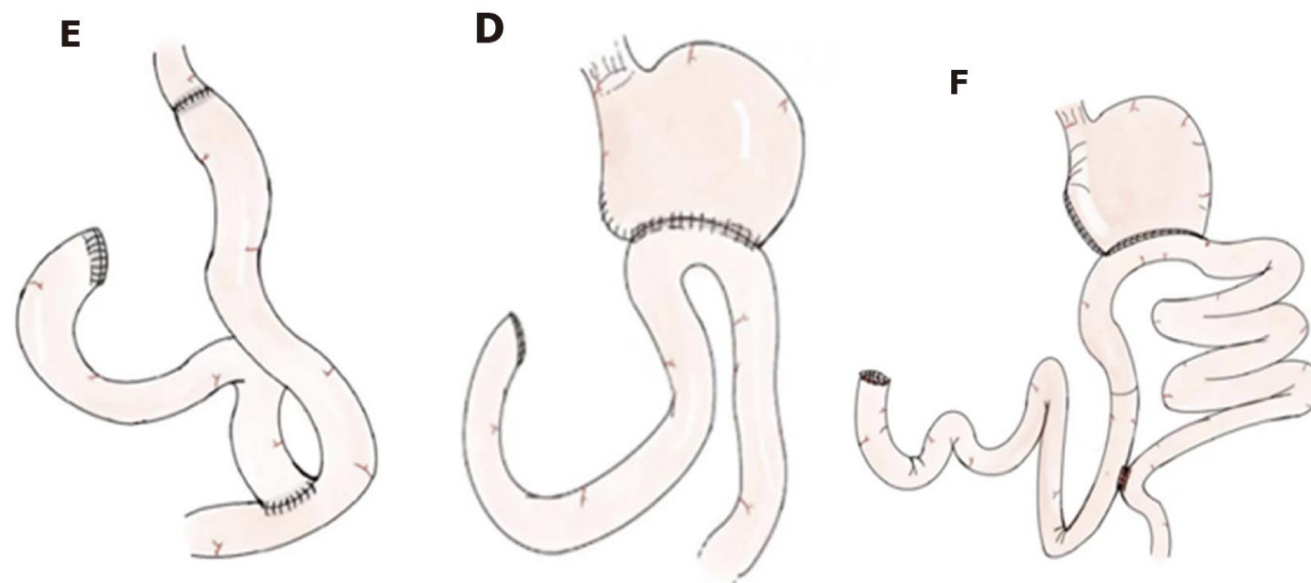
Oncometabolic surgery: Emergence and legitimacy for investigation

Won Jun Kim^{1*}, Yeongkeun Kwon^{2*}, Chang Min Lee², Seung Hyun Lim², Yong Li³, Junjiang Wang³, Weixian Hu³, Jiabin Zheng³, Gang Zhao⁴, Chunchao Zhu⁴, Wei Wang⁵, Wenjun Xiong⁵, Quan Wang⁶, Mingjie Xia⁶, Sungsoo Park²

Surgical Techniques

The operative methods most studied include:

- Roux-en-Y total gastrectomy (RYTG)
- Subtotal gastrectomy with Billroth II (BII) reconstruction
- Long-limb bypass reconstruction





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Won Jun Kim^{1*}, Yeongkeun Kwon^{2*}, Chang Min Lee², Seung Hyun Lim², Yong Li³, Junjiang Wang³, Weixian Hu³, Jiabin Zheng³, Gang Zhao⁴, Chunchao Zhu⁴, Wei Wang⁵, Wenjun Xiong⁵, Quan Wang⁶, Mingjie Xia⁶, Sungsoo Park²

Patient Selection

Success depends on several factors:

- BMI:** Lower BMI patients benefit less from weight-loss mechanisms.
- Age:** Older patients may respond less due to different diabetes pathophysiology.
- T2DM duration and severity:** Shorter disease duration and less severe disease predict better outcomes.
- Oncologic stage:** Early-stage GC patients are better candidates, potentially allowing for less radical surgery (e.g., sleeve gastrectomy instead of endoscopic resection) with dual benefits.

Kim WJ, Kwon Y, Lee CM, et al. *Oncometabolic surgery: Emergence and legitimacy for investigation*. Chin J Cancer Res. 2020;32(2):252-262.



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Outcomes

•Best results

- RYTG (Roux-en-Y total gastrectomy) and subtotal gastrectomy with Billroth II reconstruction → Highest rates of T2DM remission.

- **Emerging technique:** Long-limb bypass reconstruction (LLBR), adapted from bariatric principles, offers superior glycemic outcomes in some cohorts.

Kim WJ, Kwon Y, Lee CM, et al. *Oncometabolic surgery: Emergence and legitimacy for investigation*. Chin J Cancer Res. 2020;32(2):252-262.

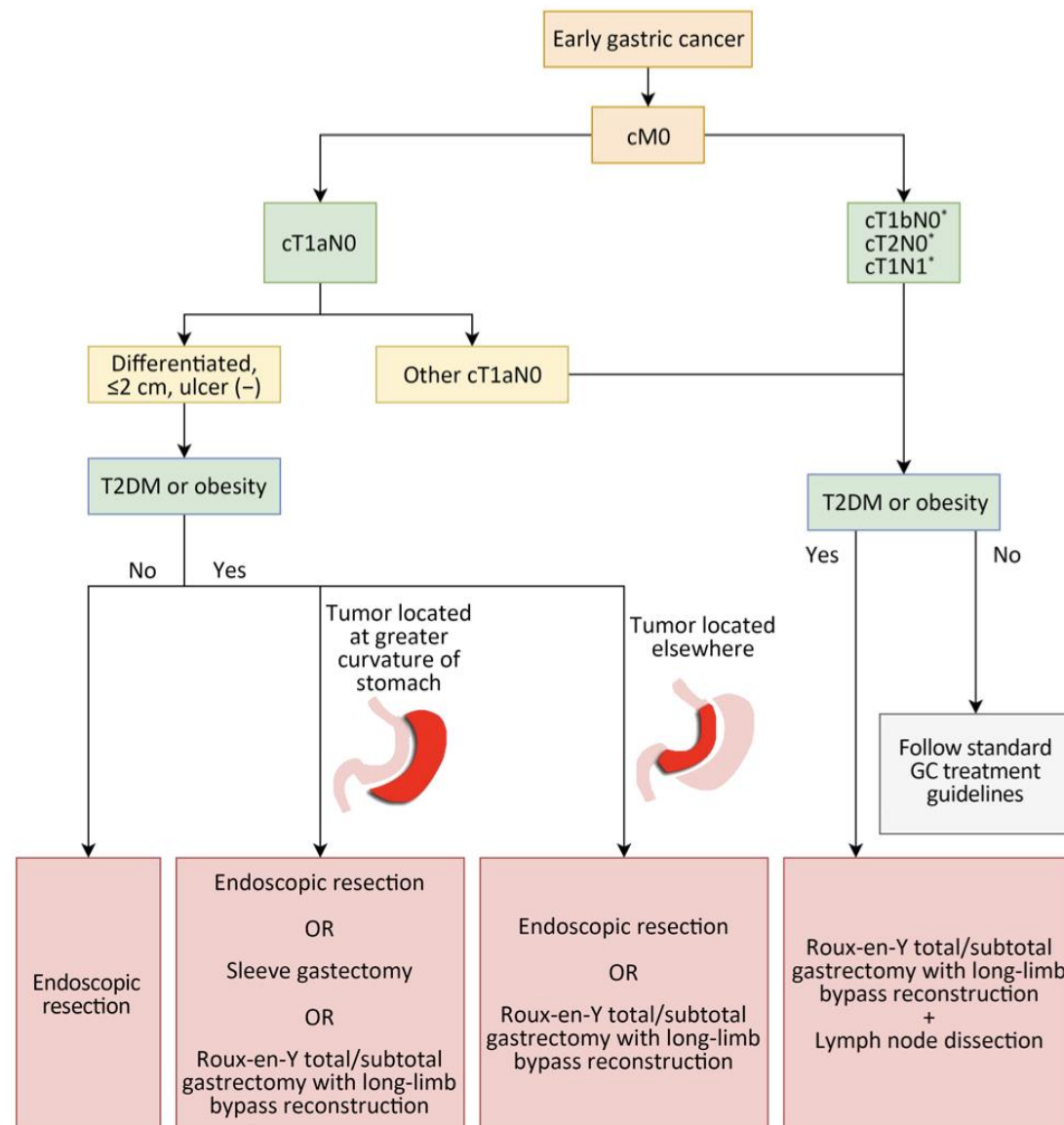


Figure 1 Possible treatment algorithm for early-stage gastric cancer (GC) patients with type 2 diabetes mellitus (T2DM). *, potentially indicated for oncometabolic surgery if further evidence demonstrates safety and equivalent oncologic outcomes as standard GC therapy.

Kim WJ, Kwon Y, Lee CM, et al. *Oncometabolic surgery: Emergence and legitimacy for investigation*. Chin J Cancer Res. 2020;32(2):252-262.

Take-home messages



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- **Bariatric surgery significantly reduces long-term risks of cancer and mortality.**
- **Specific cancer types benefit disproportionately from surgery**
- **Oncometabolic surgery emerges as a dual-purpose treatment**
- **Clinical implication**
 - Bariatric and oncometabolic surgery should be considered not only for weight loss or diabetes remission, but as a preventive strategy against obesity-associated cancers.

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Metabolic surgery as cancer prevention strategy including concurrent onco metabolic surgery

Dr. Ricardo Funke Hinojosa



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