

Supplementary Materials

Machine learning and artificial intelligence for predicting short and long-term complications following metabolic bariatric surgery - a systematic review

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Supplementary Table 1. Studies excluded at the eligibility phase, with justification

First author	Year of publication	DOI number	Reason for exclusion
Aminian A	2020	10.2337/dc19-2057	Prediction of end-organ complications as a result of MBS on obesity.
Bioletto F	2021	10.1038/s41598-021-00475-4	Non-AI/ML predictive model.
Piaggi P	2010	10.1371/journal.pone.0013624	Prediction of the effectiveness of MBS (weight loss), not complications.
Razzaghi T	2019	10.1007/s10479-019-03156-8	Prediction of the complications of obesity itself (obesity-related health problems) after bariatric surgery
Schönenberger KA	2022	10.3389/fnut.2022.855223	Non-AI/ML applications (embedded systems) for predicting hypoglycemia post-MBS.
Zhang Q	2020	10.1016/j.ijisu.2020.01.018	Bayesian network meta-analysis, not Bayesian network as an ML algorithm
Thomas DM	2017	Bariatric Times. 2017;14(12):14-17.	Prediction of the effectiveness of MBS (weight loss), not complications.

Supplementary Table 2. Subset of Included Studies Focusing on Sleeve Gastrectomy (LSG) and Roux-en-Y Gastric Bypass (RYGB)

No	Author (Year)	Procedure Focus	Study Design	Population	Key Outcome(s) Predicted	ML/AI Method(s) Used
1	Cao et al. (2019, 2020)	LSG, RYGB (SOREg)	Retrospective	44,061	General complications	Multiple (RF, MLP, CNN, RNN, etc.)
2	Wise et al. (2020)	LSG	Retrospective	101,721	30-day morbidity/mortality	ANN, LR
3	Scott et al. (2024)	Revisional RYGB after LSG	Retrospective	8,895	Morbidity/mortality	ANN, LR
4	Zucchini et al. (2024)	LSG, RYGB	Retrospective	424	30-day complications	XGB, RF, KNN, SVM
5	Butler et al. (2024)	LSG, RYGB	Registry-based	863,348	Readmissions	XGB, RF, NN, LR
6	Torquati et al. (2023)	LSG, RYGB	Registry-based	393,833	Readmissions	Super Learner, LR
7	Pan et al. (2023)	LSG	Retrospective	407	Iron deficiency anemia	SVM
8	Hsu et al. (2023)	LSG, RYGB	Registry-based	159,950	Hemorrhage	RF, XGB, NN, LR
9	Nudel et al.	LSG, RYGB	Registry-based	436,807	Leak, VTE	ANN, XGB, LR

	(2021)					
10	Ali et al. (2024)	RYGB, LSG	Retrospective	6,526	VTE	Supervised ML
11	Romero- Velez et al. (2024)	LSG, RYGB	Registry- based	755,506	MACE	ANN, LR, XGB