SUPPLEMENTARY DATA

Supplementary File

Aminian A, Zajichek A, Arterburn DE, et al. ***Predicting 10-Year Risk of End-Organ Complications of Type 2 Diabetes with and without Metabolic Surgery: A Machine Learning Approach.*** Diabetes Care.

Supplementary Table 1. Diagnosis and Procedure Codes for Study Outcomes

Supplementary Table 2. Ranking of Importance of Selected Variables in the Prediction Models for Surgical and Non-Surgical Patients

Supplementary Figure 1. Calibration plots of IDC Risk Scores and RECODe Models for Prediction of Mortality, Heart Failure, and Nephropathy in Nonsurgical Patients.

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Supplementary Table 1. Diagnosis and Procedure Codes for Study Outcomes

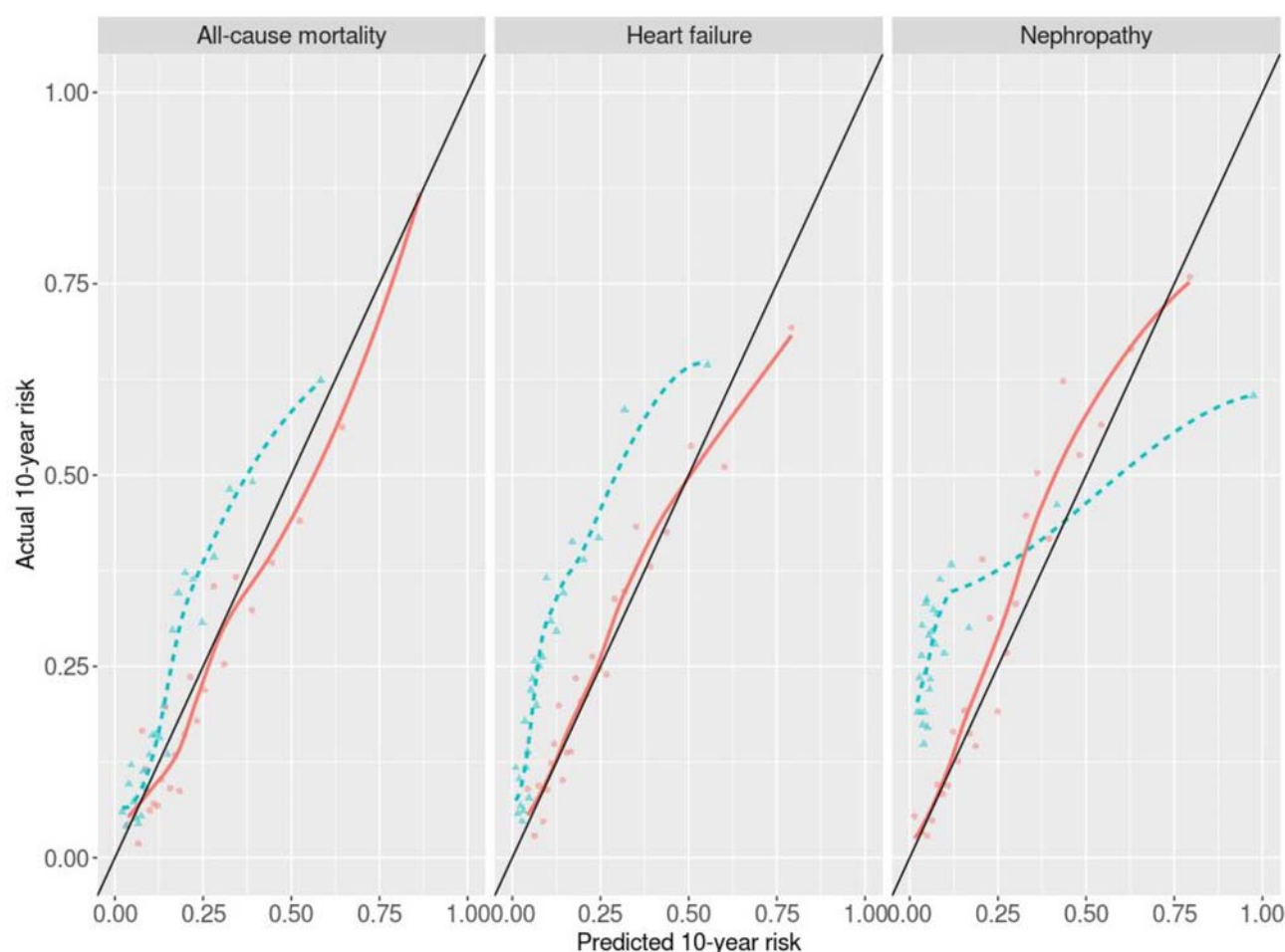| Outcome	Codes
Coronary artery disease	ICD9 (diagnoses): 410.X, **411.X**, 411.X AND **414.X** ICD9 (procedure): 36.01, 36.02, 36.03, 36.05, 36.06, 36.07, 36.10, 36.11, 36.12, 36.13, 36.14, 36.15, 36.16, 36.17, 36.19, 36.31, 36.32, 36.33, 36.64 CPT-4: 92982, 92984, 92995, 92996, 92980, 92981, 33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33530, 33533, 33534, 33535, 33536, 93539, 93540
Heart failure	ICD9: 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9
Nephropathy	≥2 measures of eGFR less than 60 mL/min separated by at least 90 days without any intervening values >= 60 mL/min. The eGFR is approximated using MDRD equation.
Bolded text indicates it must be a primary diagnosis	

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Supplementary Table 2. Ranking of Importance of Selected Variables in the Prediction Models for Surgical and Non-Surgical Patients

	All-cause mortality		Coronary events		Heart failure		Nephropathy	
	Surgical	Non-surgical	Surgical	Non-surgical	Surgical	Non-surgical	Surgical	Non-surgical
Age	1	1	1	2	1	1	2	2
Sex	8	9	3	1	12	12	9	21
BMI	2	4	19	9	2	2	5	18
Smoking	5	5	6	5	13	13	14	16
Systolic BP	14	13	12	18	6	5	8	5
HbA1c	18	15	15	6	3	3	3	9
eGFR	11	14	4	10	17	19	1	1

BMI: body mass index, BP: blood pressure, eGFR: estimated glomerular filtration rate, HbA1c: glycated hemoglobin.

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Supplementary Figure 1. Calibration plots of IDC Risk Scores (red) and RECODe Models (green) for Prediction of Mortality, Heart Failure, and Nephropathy in Nonsurgical Patients. The closer the points lie along the 45-degree line, the better the calibration.

The IDC Risk Scores outperformed RECODe on 3 examined outcomes in terms of IPA, AUC, and calibration. Calibration of mortality prediction models were further assessed with the Greenwood-D'Agostino-Nam (GND) test which is a Cox model equivalent to the Hosmer-Lemeshow test in a survival analysis setting. The

GND test non-parametrically estimates the distance between predicted and observed Kaplan-Meier outcome rates. The higher p value shows a greater concordance between the predicted and observed outcome rates. For mortality prediction models in nonsurgical patients, the p-values were 0.145 and <0.001 for IDC Risk Scores and RECODe, respectively. This indicated significant miscalibration for the RECODe but not for the IDC Risk Scores on the examined cohort.