

Supplementary Table 1 Subgroup analysis of nomogram performance by age, sex, and diabetes duration

Subgroup	<i>n</i>	C-index (95%CI)	Interaction <i>P</i> value
Age			0.38
Age < 60 years	256	0.836 (0.784-0.888)	
Age ≥ 60 years	202	0.856 (0.807-0.905)	
Sex			0.54
Male	267	0.848 (0.800-0.896)	
Female	191	0.821 (0.759-0.883)	
Diabetes Duration			0.42
Duration < 10 years	248	0.829 (0.774-0.884)	
Duration ≥ 10 years	210	0.843 (0.793-0.893)	

All interaction *P* values > 0.10, indicating no statistically significant heterogeneity in model performance across subgroups. C-indices are presented with 95%CI derived from bootstrap resampling (1000 iterations).

Supplementary Table 2 Comparison of baseline characteristics between derivation and external validation cohorts, mean ± SD/median (interquartile range)/*n* (%)

Characteristic	Derivation cohort (<i>n</i> = 458)	Validation cohort (<i>n</i> = 215)
Age (years)	56.8 ± 11.2	57.4 ± 10.8
Male sex	267 (58.3)	121 (56.3)
Diabetes duration (years)	9.7 ± 6.4	10.1 ± 6.1
BMI (kg/m ²)	26.3 ± 3.8	26.1 ± 3.6
eGFR (mL/min/1.73m ²)	78.6 ± 24.3	79.2 ± 23.8
UACR (mg/g)	85 (32–268)	91 (35–281)
HbA1c (%)	8.0 ± 1.5	8.1 ± 1.4
Hypertension	194 (42.4)	89 (41.4)
Dyslipidemia	175 (38.2)	80 (37.2)
DKD progression	142 (31.0)	64 (29.8)

No statistically significant differences were observed between the two cohorts for any listed variable (all *P* > 0.05), supporting the generalizability of the nomogram to the

external validation population. BMI: Body mass index; eGFR: Estimated glomerular filtration rate; UACR: Urine albumin-to-creatinine ratio; HbA1c: Hemoglobin A1c; DKD: Diabetic kidney disease.