Abstract title (max. 25 words):

Comparing type 1 diabetes specific macrovascular and microvascular risk calculators in adults with diabetes.

Abstract content (max. 300 words):

Aims: Risk calculators for Type 1 diabetes (T1D) chronic complications, may guide therapy. We determined: high risk rates; association with demographics; correlation and concordance between calculators for cardiovascular disease (CVD), end-stage kidney disease (ESKD), sight-threatening diabetic retinopathy (STDR), diabetic retinopathy (DR), diabetic peripheral and autonomic neuropathy (DPN, DAN) and diabetic nephropathy (DN).

Methods: An ethics-approved 10-year audit of the Baker Heart and Diabetes Institute T1D clinic was conducted. Nine calculators included: Steno T1 CVD Risk Engine (5- and 10-yr) and ESKD (5-yr); QRISK3 for CVD (10-yr); MSD Cardiovascular Risk Assessment in T1D (5-yr); Diabetes Epidemiology Group (DEG) CVD Risk Prediction T1D (10-yr); LIFE-T1D (10-yr and Life); RetinaRisk STDR (1-yr); DRRISK for retinopathy (Current); T1DMicro for DR, DAN, DPN and DN (Current); GFRDecline for kidney failure (2-3-yrs). Percentage of high-risk subjects, spearmen correlation coefficients, equality (Wilcoxon signed-rank test) and differences by age, sex and technology use (Kruskal-Wallis or Mann-Whitney test), significance at p<0.05.

Results: n=1154/1480 (without CVD or missing data); Median age (25th-75th percentile) 49 (36-61), 22 (14-33) years T1D, HbA1c 58 (52, 68) mmol/mol. ‘High’ risk rates differed by calculator (42-55% for 10-yr CVD). Risk increased with age: CVD (except LIFE-T1D-Life), kidney complications (except Steno-ESKD), retinopathy, STDR and PN (p<0.0001-0.0005). Males vs. females had increased risk: CVD (except MSD and Steno) (p<0.0001), kidney complications (p<0.0001-0.0134), retinopathy (only DRRISK) (p<0.0001) and AN (p=0.0038). Pump use had lower risk: CVD (except LIFE-T1D-Life) (p<0.0001), kidney failure (only GFRDecline) (p<0.0001) and PN (p<0.0001). Continuous glucose monitor use had lower risk: CVD (except MSD) (p=0.0005-0.0144), kidney failure (only GFRDecline) (p=0.0135), STDR (p=0.0007) and retinopathy (p=0.0149).

Calculator correlations: CVD (r=0.84-0.95, p<0.0001), retinopathy (r=0.36-0.83, p<0.0001) and kidney complication risk calculators (r=0.26-0.52, p<0.0001). Median differences were significant (p<0.0001). IQRs exceeded limits based on clinical risk categories.

Conclusions: Correlation between risk calculators is generally good but concordance is suboptimal.