

**Supplemental Table S1:** Outcomes in patients with familial vs sporadic type 1 diabetes during the first treatment year

	Sporadic N=53,606	Familial			
		All N=3,765	Patient first N=948	Relative first N=2,122	Unknown first N=695
Insulin pump treatment, % (95% CI)	15.8 (15.5-16.2)	24.8 (23.4-26.2)	16.0 (14.0-18.2)	29.1 (27.2-31.1)	25.6 (22.5-28.9)
HbA1c, % (95% CI)	7.49 (7.48-7.51)	7.39 (7.33-7.44)	7.45 (7.35-7.56)	7.34 (7.27-7.41)	7.44 (7.32-7.57)
HbA1c, mmol/mol (95% CI)	58.4 (58.2-58.5)	57.2 (56.7-57.8)	58.0 (56.8-59.1)	56.7 (56.0-57.5)	57.9 (56.5-59.2)
Patients with HbA1c <7.5% (<58 mmol/mol), % (95% CI)	61.6 (61.2-62.0)	62.7 (61.1-64.2)	62.2 (59.1-65.3)	63.4 (61.3-65.4)	61.2 (57.5-64.8)
Patients with IDAAC* at least once ≤9, % (95% CI)	61.3 (60.9-61.7)	64.2 (62.7-65.8)	59.2 (56.0-62.3)	66.6 (64.5-68.5)	63.9 (60.3-67.5)
BMI, SD score (95% CI)	0.10 (0.09-0.11)	0.13 (0.09-0.16)	0.11 (0.04-0.17)	0.11 (0.07-0.16)	0.18 (0.11-0.26)
<b>Severe hypoglycemia</b>					
No. of events	8,443	524	169	236	120
No. of patients with events (%)	3,043 (5.7)	220 (5.9)	80 (8.4)	96 (4.5)	43 (6.2)
Rate per 100 patient-yrs (95% CI)	15.8 (15.0-16.5)	13.9 (11.7-16.6)	17.8 (12.8-24.9)	11.1 (8.7-14.1)	17.3 (11.6-26.0)
<b>Hypoglycemic coma</b>					
No. of events	1,318	109	33	48	28
No. of patients with events (%)	838 (1.6)	61 (1.6)	20 (2.1)	28 (1.3)	13 (1.9)
Rate per 100 patient-yrs (95% CI)	2.5 (2.3-2.6)	2.9 (2.2-3.7)	3.4 (2.1-5.5)	2.3 (1.6-3.3)	4.1 (2.4-7.1)
<b>Diabetic ketoacidosis after diagnosis</b>					
No. of events	873	55	25	19	10
No. of patients with events (%)	690 (1.3)	44 (1.2)	20 (2.1)	16 (0.8)	8 (1.2)
Rate per 100 patient-yrs (95% CI)	1.7 (1.6-1.8)	1.5 (1.1-2.0)	2.7 (1.7-4.2)	0.9 (0.6-1.5)	1.5 (0.7-3.1)
Duration of hospital stay, days (95% CI)	18.03 (17.99-18.07)	16.7 (16.6-16.9)	18.7 (18.4-19.0)	15.6 (15.4-15.8)	17.4 (17.1-17.8)

Values are estimated from logistic (percentage of patients with insulin pump treatment, with HbA1c <7.5% (<58.5 mmol/mol), with IDAAC at least once ≤9, with at least one severe hypoglycemia, coma, diabetic ketoacidosis), linear (glycated hemoglobin, BMI SD score), negative binomial (rates of severe hypoglycemia, hypoglycemic coma, diabetic ketoacidosis after diagnosis) or Poisson (duration of hospital stay) regression analyses adjusted for age at diabetes onset (categorized as <10, 10 to 15, >15 years), sex, and migration background. HbA1c, glycated hemoglobin. \*IDAA1c, insulin dose-adjusted hemoglobin A1c, calculated as HbA1c (percent) + [4 x insulin dose (units per kilogram per 24 h)], a value ≤9 indicates partial remission period. BMI, body mass index.

**Supplemental Table S2:** Hazard ratios for outcomes severe hypoglycemia and diabetic ketoacidosis after one year disease duration related to baseline parameters in sporadic and familial type 1 diabetes

	sporadic		familial	
	Hazard ratio	P value	Hazard ratio	P value
<b>Severe hypoglycemia</b>				
Age $\geq$ 10 vs. <10 years at onset	0.50 (0.47-0.54)	<0.001	0.41 (0.31-0.56)	<0.001
Ketoacidosis no vs. yes at onset	0.81 (0.74-0.89)	<0.001	0.72 (0.50-1.04)	0.08
HbA1c $\geq$ 9 vs. <9% at onset	1.15 (1.07-1.24)	<0.001	1.08 (0.83-1.40)	0.57
<b>Diabetic ketoacidosis</b>				
Age $\geq$ 10 vs. <10 years at onset	0.70 (0.60-0.81)	<0.001	0.25 (0.12-0.52)	<0.001
Ketoacidosis no vs. yes at onset	0.57 (0.44-0.74)	<0.001	0.27 (0.11-0.66)	0.004
HbA1c $\geq$ 9 vs. <9% at onset	0.44 (0.37-0.51)	<0.001	0.70 (0.37-1.34)	0.28

Values are estimated from Cox proportional-hazards models adjusted for age at diabetes onset (<10 and  $\geq$ 10 years), sex, and migration background and are given with 95% confidence interval.

**Supplemental Table S3:** Patients with HbA1c <7.5% in percent after year 1 and year 10 related to baseline parameters and adjusted relative risks (aRR) in sporadic and familial type 1 diabetes

	sporadic				familial			
	Age <10 years	Age ≥10 years	aRR	P value	Age <10 years	Age ≥10 years	aRR	P value
Year 1	62.1 (61.6-62.7)	60.8 (60.2-61.4)	0.98 (0.97-0.99)	0.002	62.9 (61.1-64.9)	62.7 (60.2-65.4)	1.00 (0.95-1.05)	0.90
Year 10	35.4 (34.4-36.4)	43.2 (40.1-46.6)	1.22 (1.23-1.32)	<0.001	32.4 (29.6-35.5)	31.3 (20.9-47.0)	0.97 (0.66-1.47)	0.87
	Ketoacidosis	No ketoacidosis	aRR	P value	Ketoacidosis	No ketoacidosis	aRR	P value
Year 1	55.4 (54.4-56.5)	62.0 (61.5-62.6)	1.12 (1.10-1.14)	<0.001	52.4 (47.5-57.7)	63.7 (61.9-65.5)	1.22 (1.10-1.35)	<0.001
Year 10	35.4 (33.1-37.9)	36.2 (34.9-37.4)	1.02 (0.95-1.10)	0.59	33.0 (25.6-42.5)	32.8 (29.4-36.7)	1.00 (0.76-1.31)	0.98
	HbA1c <9%	HbA1c ≥9	aRR	P value	HbA1c <9%	HbA1c ≥9	aRR	P value
Year 1	67.6 (67.0-68.2)	57.2 (56.7-57.8)	0.85 (0.84-0.86)	<0.001	69.8 (67.8-71.9)	54.8 (52.5-57.1)	0.78 (0.75-0.83)	<0.001
Year 10	37.3 (36.0-38.7)	34.8 (33.5-36.1)	0.93 (0.89-0.98)	0.008	34.8 (31.1-38.8)	29.3 (25.2-34.1)	0.84 (0.70-1.02)	0.07

Values are estimated from logistic regression analyses adjusted for age at diabetes onset, sex, and migration background with an interaction term between baseline parameters at onset (age ≥10 years vs. <10 years, ketoacidosis no vs. yes, HbA1c ≥9% vs. <9%) and outcome (proportion of patients with HbA1c <7.5%). Values are given as adjusted means and adjusted relative risk (aRR) with 95% confidence interval. The sporadic diabetes cohort comprises 27,880 patients aged <10 years and 25,726 patients aged ≥10 years at onset in year 1, 9,474 patients aged <10 years and 915 patients aged ≥10 years at onset in year 10; 8,430 patients with ketoacidosis and 32,937 patients without ketoacidosis at onset in year 1, 1,572 patients with ketoacidosis and 6,015 patients without ketoacidosis at onset in year 10; 22,257 patients with HbA1c <9% at and 31,349 patients with HbA1c ≥9% at onset in year 1, 5,102 patients with HbA1c <9% and 5,287 patients with HbA1c ≥9% at onset in year 10. The familial diabetes cohort comprises 2,446 patients aged <10 years and 1,319 patients aged ≥10 years at onset in year 1, 947 patients aged <10 years and 54 patients aged ≥10 years at onset in year 10; 367 patients with ketoacidosis and 2,714 patients without ketoacidosis at onset in year 1, 125 patients with ketoacidosis and 631 patients without ketoacidosis at onset in year 10; 1,981 patients with HbA1c <9% and 1,784 patients with HbA1c ≥9% at onset in year 1, 586 patients with HbA1c <9% and 415 patients with HbA1c ≥9% at onset in year 10.

## **Legend to Supplemental Figure S1**

### **Acute diabetes complications over 10 years related to baseline parameters in familial and sporadic type 1 diabetes**

Shown are the cumulative incidence of severe hypoglycemia (A, C, E) and diabetic ketoacidosis (B, D, F) related to age <10 or  $\geq 10$  years (A, B), presence or absence of ketoacidosis (C, D), and HbA1c  $\geq 9\%$  or <9% (E, F) at onset in sporadic and familial type 1 diabetes from Kaplan-Meier analyses. In the sporadic diabetes cohort, n=13,236 patients had at least one event of severe hypoglycemia, and n=3,945 patients had at least one event of diabetic ketoacidosis. In the familial diabetes cohort, n=1,026 patients had at least one event of severe hypoglycemia, and n=299 patients had at least one event of diabetic ketoacidosis. Hazard ratios (HR) are estimated from adjusted Cox proportional-hazards models for comparison of age  $\geq 10$  vs. <10 years, absence of ketoacidosis vs. presence of ketoacidosis, and HbA1c  $\geq 9\%$  vs. <9% at onset in sporadic and familial type 1 diabetes.