The Steno Tech Explore study – research protocol

Contents

0. Cover page

Official title: Steno Tech Explore: A Multisite Exploratory Study of People with Type 1 Diabetes on Insulin Pump Therapy

NTC number: NCT04311164

Document date: January 22, 2021

1. Introduction

Optimal diabetes self-management in people with type 1 diabetes is important to minimize the risk of developing long-term microvascular and macrovascular complications (1, 2). However, only 21% of US adults with type 1 diabetes achieve the recommended target glycated hemoglobin level (HbA1c) of < 7.0% (53 mmol/mol) (3) and recent Danish data show success rates of approximately 25% (4).

One way to improve self-management and thus prevent or delay complications is to introduce diabetes technologies such as continuous subcutaneous insulin infusion (CSII) and/or continuous glucose monitoring (CGM) into individuals' treatment regimens. An estimated 40-62% of adults with type 1 diabetes in the US and 5-15% of those in Europe use CSII with or without CGM (5). Recent observational data from the type 1 diabetes Exchange registry show that while not reaching HbA1c target on average, people using CSII achieve improved metabolic outcomes compared to people using multiple daily injections, and that combining CSII with CGM substantially improves outcomes (3). However, it is recognized that reaping the benefits of these technologies requires high levels of engagement from users and health care professionals (HCPs), and that outcomes vary greatly among individuals (6-8).

To ensure optimal use of CSII and/or CGM, it is recommended that people with type 1 diabetes receive structured and recurring education (6, 7, 9). Yet, there is currently no consensus on which educational practice is best for a given patient (9, 10), and the literature indicates a paucity of high quality comparative studies regarding the effectiveness of technology-specific education (11, 12). Studies involving technology-specific education have shown that people with type 1 diabetes treated with CSII often do not use advanced pump functions or benefit substantially (13-15). These observations are concerning, particularly when combined with findings that using advanced functions can lead to improved HbA1c (16-19). It is frequently found that device-specific satisfaction is a good predictor of device utilization (20-23); however, preferences for device properties have seldomly been investigated or linked to outcomes and treatment goals of the individual (24). Whereas research mostly has focused on device-specific preferences and satisfaction (20-24), only little research has been conducted into individuals' needs and preferences for technology-specific education (12). However, meeting the needs and integrating the preferences of the individual in new interventions is considered integral to ensuring patient-centered and effective care (25-27). Accordingly, taking the target group's needs and preferences into account is essential to developing effective educational strategies (11, 25).

There are other barriers to treatment success than acquiring and maintaining the necessary skills to successfully manage CSII. For example, factors such as age and baseline HbA1c at treatment initiation have been identified as important predictors of treatment success in CSII-users (28-33).

Only a modest amount of literature has examined how psychosocial factors predict success (34, 35), with one study finding that psychological determinants, especially self-efficacy and locus of control, account for 50% of observed variation in HbA1c in people with type 1 diabetes using CSII (34). Likewise, an important known psychosocial predictor of poor diabetes outcomes is diabetes distress. One study found that a high level of diabetes distress was associated with higher HbA1c and less time in range compared to moderate or low levels of diabetes distress in people with type 1 diabetes using CSII; however, the high diabetes distress group did not perform less pump-specific

self-management activities (e.g., use of bolus wizard) suggesting that other mechanisms than technology-specific behavior may drive differences in outcomes (36). Thus, alongside demographic, socioeconomic and health status factors, psychological and psychosocial predictors may play a significant yet underexplored part in the successful use of diabetes technology.

2. Aim

The present study is part of an overarching study being conducted in Denmark at Steno Diabetes Center Copenhagen (SDCC) and Nordsjællands Hospital Hillerød (NOH), Steno Tech, that aims to develop and ultimately, in a randomized controlled trial (RCT), test approaches that can assist people with type 1 diabetes in obtaining optimal outcomes using CSII. Through a large-scale, questionnaire-based online survey enriched with data from national registers, this sub-study contributes to this overarching aim by exploring the importance of individual differences across a wide range of factors, including demographic, socioeconomic, health status, psychosocial and preference structures, for optimal use of CSII in people with type 1 diabetes.

3. Methods

3.1 Study groups/cohorts

The study population consists of two groups/cohorts:

1. Steno Tech Survey Respondents: A cohort of individuals with type 1 diabetes treated with CSII at either SDCC or NOH participating in the Steno Tech Survey.
2. General Type 1 Diabetes Population: A cohort consisting of the entire population of people with type 1 diabetes in Denmark not included in the Steno Tech Survey cohort (ca. 25.000 individuals).

3.2 Participant eligibility and selection

All adults (18+ years) with type 1 diabetes using CSII attending SDCC or NOH was invited to participate in the survey (N = 1,592); however, people who were not fluent in Danish were excluded as the survey was only available in Danish. The general type 1 diabetes group will be identified via the National Patient Registry (NPR) once data are ready for analysis (see section 3.6).

3.3 Survey recruitment procedure

Beginning in quarter 3 of 2019, eligible survey participants were approached by their primary HCP in conjunction with a consultation at SDCC or NOH and invited to participate in the survey. If they agreed to participate, they received, upon survey-opening, an invitation in e-Boks[1] with a link to the survey and a standardized, mandatory document containing information on how their data would be stored and used. Before answering the survey, participants were prompted to provide written consent.

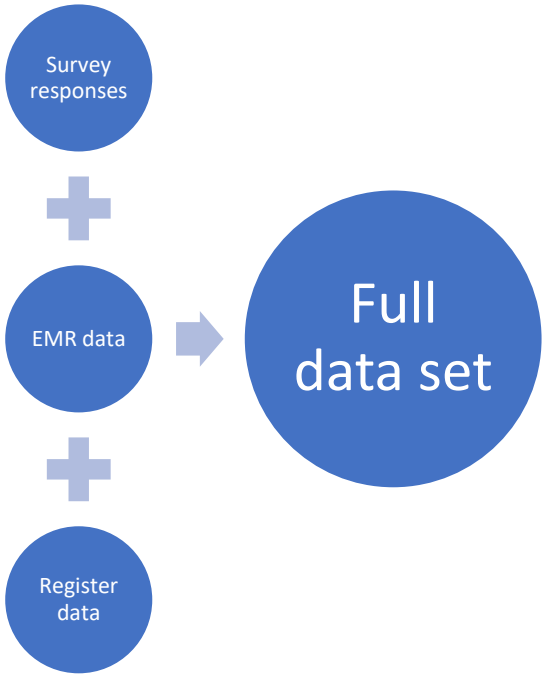
[1] e-Boks is an electronic mailbox designed to provide a digital and secure communication path between Danish citizens, companies and public authorities. As of quarter 2 of 2019, 91.5% of all Danish citizens have an e-Boks.

3.4 Data collection procedure

The survey was designed and administered in REDCap, an online browser-based data and survey management tool. The REDCap server is encrypted, logged and administered by the Capital Region of Denmark. Thus, the tool is cleared for storing and handling person-sensitive information according to Danish law.

The survey data are to be merged with outcome and other input data from electronic medical records (EMRs) and national Danish registers and stored and analyzed on a secure server at Statistics Denmark (figure 1).

Figure 1: Overview of data sources



3.5 Survey content

The survey consisted of multiple elements as per the study aim (table 1 presents an overview, appendix 1 presents the survey in full). Importantly, this sub-study is preceded by a qualitative part of the Steno Tech Explore study that explored: 1) possibilities and barriers to effective daily insulin pump management, 2) specific circumstances and contexts in relation to the possibilities and barriers such as availability and appropriateness of structured education and other support, and 3) needs and preferences in overcoming barriers and optimizing possibilities for implementing and managing technology in daily life. The content of the survey is partly inspired by concepts and themes identified in that study and partly by systematic literature reviews (11, 12, 37, 38) and professional experience.

Table 1: Overview of survey content

Survey parts	Single survey items	Survey questionnaire scales	Survey page nrs.*
1) Insulin pump and sensor-specific characteristics and behavior	♥ Type(s) of device(s) ♥ Reason(s) for device start ♥ Device functions used ♥ Data upload practices	**Insulin Device Satisfaction Survey (IDSS)**(22): consists of 13 items has three subscales: 1) perceived effectiveness, 2) burden, and 3) inconvenience. **Glucose Monitoring System Satisfaction Survey (GMSS)**(39): consists of 15 items and has four subscales: 1) openness, 2) emotional burden, 3) behavioral burden, 4) trust. New insulin pump attitude scale compiled of questions from validated scales(40, 41): included 8 items specifically about wearing an insulin pump (e.g., the degree to which it makes one feel less attractive) and everyday challenges (e.g., the degree to which it is a problem during sex).	2-5, 10-12
2) Experience with insulin pump education	♥ Received education (group/individual) ♥ Desired education (group/individual) ♥ Insulin pump-knowledge and support needs		6-8
3) Carbohydrate counting exercise	♥ Chocolate (6 images) ♥ Pasta (6 images) ♥ Grapes (6 images) ♥ Bread rolls (5 images)	Respondents were asked to indicate if they ate the presented food items 1) never, 2) occasionally or 3) often. If occasionally or often, they were shown an image and asked to pick the serving size they would usually eat and to eyeball the amount of carbohydrates in that serving size.	9
4) Health-management behavior	♥ Physical activity ♥ Diet ♥ Alchol intake ♥ Smoking status	Items about physical activity, diet, alcohol intake, and smoking status were based on recommended guidelines from the Danish Health Authority.	13

5) General and diabetes-specific psychosocial health		**Well-Being Index (WHO5)**(42): consists of 5 items. **Hypoglycemia Fear Survey short-form (HFS-SF)(43)**: consists of 11 items and has a worry and a behavior subscale. **Type 1 Diabetes Distress Scale (T1-DDS)(44)**: consists of 28 items and has seven subscales: 1) powerlessness, 2) management distress, 3) hypoglycaemia distress, 4) negative social perceptions, 5) eating distress, 6) physician distress, and 7) friend/family distress. **DAWN Support for Diabetes Self-Management Profile (DSDSP)** (extended)(45): this version of the DSDSP consists of 6 items. **The COVID-19 Impact on Quality of Life Profile**(46): The COVID-19 Impact on Quality of Life Profile is a newly-designed scale, inspired by the 'DAWN Impact of Diabetes Profile (DIDP)' scale and consists of 9 items.	14-16, 19-20
6) Personality factors and goal-setting	♥ Self-efficacy ♥ Time preferences ♥ Risk aversion ♥ Treatment goals	General Self-Efficacy Scale (GSE)(47): consists of 10 items.	17-18, 21-27
7) Self-rated health status and satisfaction with life	♥ Health status VAS ♥ Life satisfaction VAS	Both VAS scales ranged from 0-10, with 10 respresenting the best thinkable health status/satisfaction and 0 the worst.	19

Abbreviations: N/A = not applicable; VAS = visual analog scale. *Page numbers refer to actual order in the survey and correspond to appendix XX including all survey items.

3.6 Register and EMR data

Register data will be obtained via Statistics Denmark and include variables from several registers, including the following population registries: The National Population Registry, the Civil Registration System, the Education Registry, the Income Registry and the Address Registry, and the following health registries: the National Patient Registry, the National Prescription Registry, the Hospital Medicine Registry, and the Health Insurance Registry. A data extraction agreement with Statistics Denmark has been made and is currently being processed.

Key population variables extracted for both study groups include, but are not limited to, gender, age, education, occupation and income (socioeconomic status), as well as household composition, all encounters with the health care system in the survey period (e.g., if the participant has been admitted to the hospital with a ketoacidosis), redeemed prescriptions from hospitals and pharmacies, and distance to health care services from private address.

Diabetes-specific clinical outcomes in both study groups will be extracted from registers, and from survey respondents' EMRs. Register-extracted outcomes include all blood and urine test measures taken at the annual 'check-up', including HbA1c, hemoglobin, eGFR, UACR, cholesterol total, HDL, LDL, VLDL, triglycerides, diabetes-related complications and other somatic and psychiatric comorbidities. EMR-extracted outcomes (available only for the survey group) include BMI, blood pressure and hypoglycemia awareness status, which are not tracked in national registers.

3.7 Data analysis

The overall data analysis approach is based on descriptive, non-parametric and parametric statistical methods. Descriptive statistics will include amounts/counts (n), shares (%), means and variable distributions (standard deviations and percentiles). Non-parametric hypothesis tests will include the Chi-squared test, Fisher's exact test and Wilcoxon rank test depending on variable distributions. Parametric hypothesis tests will center on Student's unpaired and paired t-tests as well as general and generalized regression analyses. Model error structures will depend on the specific objective but, in general, take the following form:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_n X_{ni} + e_i$$

where Y is the dependent variable (e.g., HbA1c) for individual i, β_n is the effect on Y_i given X_n, where X_n indicates demographic, socioeconomic, behavioral and psychosocial factors, and e_i indicates residual error (i.e., unexplained variance).

Furthermore, quasi-experimental procedures such as propensity score or coarsened exact matching and machine-learning algorithms such as random forest will be employed to maximize data usage and to foster meaningful comparisons within and between the two study groups.

3.8 Ethics

The study was approved by the Danish Data Protection Agency (P-2019-812) and exempted from review by the Capital Region of Denmark's Research Ethics Committee (19080899). The study was also registered on ClinicalTrials.gov (NCT04311164).

4. Results

Data collection for this study is currently in progress. Survey data collection was initiated on May 15, 2020 and completed on October 15, 2020. In total, 770 individuals responded to the survey. EMR and register data are currently being extracted and prepared for merge with survey data by Statistics Denmark.

5. References

1. Diabetes C, Complications Trial Research G, Nathan DM, Genuth S, Lachin J, Cleary P, et al. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* 1993; **329**: 977-986.
2. Nathan DM, Cleary PA, Backlund JY, Genuth SM, Lachin JM, Orchard TJ, et al. Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes. *N Engl J Med* 2005; **353**: 2643-2653.
3. Foster NC, Beck RW, Miller KM, Clements MA, Rickels MR, DiMeglio LA, et al. State of Type 1 Diabetes Management and Outcomes from the T1D Exchange in 2016-2018. *Diabetes Technol Ther* 2019; **21**: 66-72.
4. Dansk Voksen Diabetes Database, Dansk Register for Børne- og Ungdomsdiabetes, Landsdækkende klinisk kvalitetsdatabase for screening af diabetisk retinopati og maculopati, Regionernes Kliniske Kvalitetsudviklingsprogram. Dansk Diabetes Database - National årsrapport 2017/2018. Copenhagen, Denmark 2018.
5. Naranjo D, Tanenbaum ML, Iturralde E, Hood KK. Diabetes Technology: Uptake, Outcomes, Barriers, and the Intersection With Distress. *J Diabetes Sci Technol* 2016; **10**: 852-858.
6. Franklin V. Influences on Technology Use and Efficacy in Type 1 Diabetes. *J Diabetes Sci Technol* 2016; **10**: 647-655.
7. Barnard KD, Breton MD. Diabetes Technological Revolution: Winners and Losers? *J Diabetes Sci Technol* 2018; **12**: 1227-1230.
8. Pickup JC. Is insulin pump therapy effective in Type 1 diabetes? *Diabet Med* 2019; **36**: 269-278.
9. Grunberger G, Abelseth JM, Bailey TS, Bode BW, Handelsman Y, Hellman R, et al. Consensus Statement by the American Association of Clinical Endocrinologists/American College of Endocrinology insulin pump management task force. *Endocr Pract* 2014; **20**: 463-489.
10. Pickup JC. The evidence base for diabetes technology: appropriate and inappropriate meta-analysis. *J Diabetes Sci Technol* 2013; **7**: 1567-1574.
11. Jayasekara RS, Munn Z, Lockwood C. Effect of educational components and strategies associated with insulin pump therapy: a systematic review. *Int J Evid Based Healthc* 2011; **9**: 346-361.
12. Payk M, Robinson T, Davis D, Atchan M. An integrative review of the psychosocial facilitators and challenges of continuous subcutaneous insulin infusion therapy in type 1 diabetes. *J Adv Nurs* 2018; **74**: 528-538.
13. Group RS. Relative effectiveness of insulin pump treatment over multiple daily injections and structured education during flexible intensive insulin treatment for type 1 diabetes: cluster randomised trial (REPOSE). *BMJ* 2017; **356**: j1285.
14. Ehrmann D, Kulzer B, Schipfer M, Lippmann-Grob B, Haak T, Hermanns N. Efficacy of an Education Program for People With Diabetes and Insulin Pump Treatment (INPUT): Results From a Randomized Controlled Trial. *Diabetes Care* 2018; **41**: 2453-2462.
15. Joubert M, Morera J, Vicente A, Rod A, Parienti JJ, Reznik Y. Cross-sectional survey and retrospective analysis of a large cohort of adults with type 1 diabetes with long-term continuous subcutaneous insulin infusion treatment. *J Diabetes Sci Technol* 2014; **8**: 1005-1010.
16. Mameli C, Scaramuzza AE, Ho J, Cardona-Hernandez R, Suarez-Ortega L, Zuccotti GV. A 7-year follow-up retrospective, international, multicenter study of insulin pump therapy in children and adolescents with type 1 diabetes. *Acta Diabetol* 2014; **51**: 205-210.
17. Cukierman-Yaffe T, Konvalina N, Cohen O. Key elements for successful intensive insulin pump therapy in individuals with type 1 diabetes. *Diabetes Res Clin Pract* 2011; **92**: 69-73.
18. Walsh J, Roberts R, Bailey T. Guidelines for optimal bolus calculator settings in adults. *J Diabetes Sci Technol* 2011; **5**: 129-135.

19. O'Connell MA, Donath S, Cameron FJ. Poor adherence to integral daily tasks limits the efficacy of CSII in youth. *Pediatr Diabetes* 2011; **12**: 556-559.
20. Walsh J, Roberts R, Weber D, Faber-Heinemann G, Heinemann L. Insulin Pump and CGM Usage in the United States and Germany: Results of a Real-World Survey With 985 Subjects. *J Diabetes Sci Technol* 2015; **9**: 1103-1110.
21. Peyrot M, Rubin RR. Patient-reported outcomes for an integrated real-time continuous glucose monitoring/insulin pump system. *Diabetes Technol Ther* 2009; **11**: 57-62.
22. Polonsky WH, Fisher L, Hessler D, Edelman SV. Development of a New Measure for Assessing Insulin Delivery Device Satisfaction in Patients with Type 1 and Type 2 Diabetes. *Diabetes Technol Ther* 2015; **17**: 773-779.
23. Heinemann L, Freckmann G, Ehrmann D, Faber-Heinemann G, Guerra S, Waldenmaier D, et al. Real-time continuous glucose monitoring in adults with type 1 diabetes and impaired hypoglycaemia awareness or severe hypoglycaemia treated with multiple daily insulin injections (HypoDE): a multicentre, randomised controlled trial. *Lancet* 2018; **391**: 1367-1377.
24. Perard R, Orme M. A Discrete Choice Experiment to Evaluate Blood Glucose Meter Preferences in People with Type 1 and Type 2 Diabetes in the UK. *Intern Med* 2014; **S6**: S6:008.
25. Fan L, Sidani S. Preferences of Persons with Type 2 Diabetes for Diabetes Self-Management Education Interventions: An Exploration. *Health* 2017; **9**: 1569-1588.
26. Sidani S, Epstein D, Miranda J. Eliciting patient treatment preferences: A strategy to integrate evidence-based and patient-centered care. *Worldviews Evid Based Nurs* 2006; **3**: 116-123.
27. Sidani S, Miranda J, Epstein D, Fox M. Influence of treatment preferences on validity: a review. *Can J Nurs Res* 2009; **41**: 52-67.
28. Shalitin S, Gil M, Nimri R, de Vries L, Gavan MY, Phillip M. Predictors of glycaemic control in patients with Type 1 diabetes commencing continuous subcutaneous insulin infusion therapy. *Diabet Med* 2010; **27**: 339-347.
29. Clements M, Matuleviciene V, Attvall S, Ekelund M, Pivodic A, Dahlqvist S, et al. Predicting the effectiveness of insulin pump therapy on glycemic control in clinical practice: a retrospective study of patients with type 1 diabetes from 10 outpatient diabetes clinics in Sweden over 5 years. *Diabetes Technol Ther* 2015; **17**: 21-28.
30. Jankovec Z, Cesak V, Krcma M, Zourek M, Rusavy Z. Can we predict success of insulin pump therapy? *J Diabetes* 2014; **6**: 384-386.
31. Neylon OM, O'Connell MA, Skinner TC, Cameron FJ. Demographic and personal factors associated with metabolic control and self-care in youth with type 1 diabetes: a systematic review. *Diabetes Metab Res Rev* 2013; **29**: 257-272.
32. Neylon OM, Skinner TC, O'Connell MA, Cameron FJ. A novel tool to predict youth who will show recommended usage of diabetes technologies. *Pediatr Diabetes* 2016; **17**: 174-183.
33. Andersen HU, Hangaard S, Hommel E, Ridderstrale M. Six-Year Follow-Up After Insulin Pump Initiation: HbA1c Is Significantly Reduced Without Weight Gain. *J Diabetes Sci Technol* 2018; **12**: 535-536.
34. Aberle I, Scholz U, Bach-Kliegel B, Fischer C, Gorny M, Langer K, et al. Psychological aspects in continuous subcutaneous insulin infusion: a retrospective study. *J Psychol* 2009; **143**: 147-160.
35. Indelicato L, Mariano V, Galasso S, Boscari F, Cipponeri E, Negri C, et al. Influence of health locus of control and fear of hypoglycaemia on glycaemic control and treatment satisfaction in people with Type 1 diabetes on insulin pump therapy. *Diabet Med* 2017; **34**: 691-697.
36. Khan A, Choudhary P. Investigating the Association Between Diabetes Distress and Self-Management Behaviors. *J Diabetes Sci Technol* 2018; **12**: 1116-1124.

37. Madsen KP, Kjaer T, Skinner T, Willaing I. Time preferences, diabetes self-management behaviours and outcomes: a systematic review. *Diabet Med* 2019; **36**: 1336-1348.
38. Grose DN, O'Brien CL, Castle DJ. Type 1 diabetes and an insulin pump: an iterative review of qualitative literature. *Practical Diabetes* 2017; **34**: 281-287.
39. Polonsky WH, Fisher L, Hessler D, Edelman SV. Development of a New Measure for Assessing Glucose Monitoring Device-Related Treatment Satisfaction and Quality of Life. *Diabetes Technol Ther* 2015; **17**: 657-663.
40. Bergis D, Roos T, Ehrmann D, Schmitt A, Schipfer M, Haak T, et al. Perceived Benefits and Barriers Regarding CSII Treatment: Development and Psychometric Evaluation of the Insulin Pump Attitudes Questionnaire (IPA-Questionnaire). *Exp Clin Endocrinol Diabetes* 2019.
41. Tanenbaum ML, Hanes SJ, Miller KM, Naranjo D, Bensen R, Hood KK. Diabetes Device Use in Adults With Type 1 Diabetes: Barriers to Uptake and Potential Intervention Targets. *Diabetes Care* 2017; **40**: 181-187.
42. Topp CW, Ostergaard SD, Sondergaard S, Bech P. The WHO-5 Well-Being Index: a systematic review of the literature. *Psychother Psychosom* 2015; **84**: 167-176.
43. Grabman J, Vajda Bailey K, Schmidt K, Cariou B, Vaur L, Madani S, et al. An empirically derived short form of the Hypoglycaemia Fear Survey II. *Diabet Med* 2017; **34**: 500-504.
44. Fisher L, Polonsky WH, Hessler DM, Masharani U, Blumer I, Peters AL, et al. Understanding the sources of diabetes distress in adults with type 1 diabetes. *J Diabetes Complications* 2015; **29**: 572-577.
45. Nicolucci A, Kovacs Burns K, Holt RI, Comaschi M, Hermanns N, Ishii H, et al. Diabetes Attitudes, Wishes and Needs second study (DAWN2): cross-national benchmarking of diabetes-related psychosocial outcomes for people with diabetes. *Diabet Med* 2013; **30**: 767-777.
46. Holmes-Truscott E, Skovlund SE, Hendrieckx C, Pouwer F, Peyrot M, Speight J. Assessing the perceived impact of diabetes on quality of life: Psychometric validation of the DAWN2 Impact of Diabetes Profile in the second Diabetes MILES - Australia (MILES-2) survey. *Diabetes Res Clin Pract* 2019; **150**: 253-263.
47. Mikkelsen EG, Schwarzer R, Jerusalem M. Danish Version of the General Self-Efficacy Scale. 1999.
48. Acquadro C, Conway K, Hareendran A, Aaronson N, European Regulatory I, Quality of Life Assessment G. Literature review of methods to translate health-related quality of life questionnaires for use in multinational clinical trials. *Value Health* 2008; **11**: 509-521.
6

6. Appendices

6.1 Appendix 1: The Steno Tech Survey

In the following questionnaire (see next page), the IDSS and GMSS were translated from English to Danish using the internationally recognized forward-backward translation procedure (48). Two experienced native Danish diabetes researchers fluent in English independently forward translated each scale (i.e., from English to Danish). The forward translations were then compared by a third researcher and analyzed for discrepancies, which were then discussed among all three researchers until consensus was reached. This was followed by a similar procedure, only backwards, by two other researchers, one of whom is a native English speaker fluent in Danish.

Face validity of the translated questionnaires was ensured through one-to-one interviews in the survey testing phase where, for example, the item on cost was removed from the IDSS due to irrelevance in the Danish publicly funded health care setting.

Steno Tech Explore survey

Page 1 of 28

Introductory page including information described in section 3.3.

Page 2 of 28

Scale/item [branching logic]	Question	Response categories
The first part of the questionnaire is about your insulin pump usage. There are also questions about your use of sensor, if applicable. **When you are done answering all the questions on a page, press "next page" at the bottom of the page in order to continue.** **It takes about 30-40 minutes to complete the entire questionnaire. You can take a break along the way and continue the questionnaire later by simply shutting down the page and using the link in e-Boks again – disregard the "save and return later" button.**		
pumptype	What insulin pump are you currently using? You will be shown a picture of the insulin pump below when you click on the name of the insulin pump.	1. MiniMed 640G 2. MiniMed 670G 3. MiniMed Paradigm/VEO 4. Accu-Chek Combo 5. Accu-Chek Insight 6. Omnipod 7. Medtrum 8. Tandem t:slim X2 9. YpsoPump 10. Animas Vibe 11. Other 12. I use a hybrid closed-loop system that I built myself with an open-source software such as OPENAPS, AndroidAPS or Loop.
pumptype_other [if pumptype = 11]	What other insulin pump are you currently using?	Open-ended response
diabetesdebut	In which year were you diagnosed with type 1 diabetes? If you do not remember the exact year, please provide an approximate estimate.	Open-ended response
pumpyear	In which year did you get your first insulin pump? If you do not remember the exact year, please provide an approximate estimate.	Open-ended response

pumpindication	What was the reason that you were initially offered an insulin pump by your healthcare provider? Feel free to choose several reasons.	1. I had too high long-term blood glucose (HbA1c) 2. I had major fluctuations in my blood sugar 3. I could not feel low blood-sugars 4. Other 5. Do not know/do not remember
pumpindication_other [if pumpindication = 4]	What other reasons were behind you being offered an insulin pump?	Open-ended response
pumpwhy	What was(were) the reason(s) you initially agreed to use the insulin pump? Feel free to choose several reasons.	1. To improve long-term blood glucose (HbA1c) 2. To achieve a more stable blood sugar (fewer fluctuations) 3. To reduce the number of high blood sugars 4. To reduce the number of low blood sugars 5. To get better sleep 6. To be able to eat more flexibly 7. To be able to exercise more spontaneously 8. To make it easier to take and dose insulin 9. To avoid injecting myself several times a day 10. My healthcare provider recommended it to me 11.Other insulin pump users recommended it to me 12. To make my diabetes fill less in my life 13. Other 14. Do not know/do not remember
pumpwhy_other [if pumpwhy = 13]	What other reasons were there, for you to agree to start insulin pump treatment?	Open-ended response

Scale/item [branching logic]	Question	Response categories
The following questions are about how you are using your current insulin pump.		
bolus	How do you usually take bolus insulin?	1. Bolus calculator/bolus guide 2. Manual bolus (including fast bolus) 3. I use both equally 4. I very rarely take bolus insulin
bolus_whynot [if bolus = 4]	Why do you not typically use the bolus guide to calculate bolus insulin?	1. It is too difficult to use 2. I did not learn it at pump start and have not started doing it since 3. I do not trust the bolus guide's calculations 4. I calculate bolus myself, as my experience is that this works best 5. Other 6. Do not know
bolus_whynot_other [if bolus_whynot = 5]	What other reasons are there for why you do not typically use the bolus guide to calculate bolus insulin?	Open-ended response
bolususe_intro [if pumptype ≠ 11 or 12 and bolus ≠ 4]	How often do you use your bolus calculator to…	
bolususe1 [if pumptype ≠ 11 or 12 and bolus ≠ 4]	… calculate bolus for food?	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
bolususe2 [if pumptype ≠ 11 or 12 and bolus ≠ 4]	… calculate correction-insulin for elevated blood sugar?	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
bolusbasalfunctions_intro [if pumptype ≠ 2, 11 or 12]	How often do you use these insulin pump functions when they are relevant? **[stand-alone pump users]**	
bolus1 [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4]	Combined bolus when it is relevant (e.g., for fast food)	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
bolus2 [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4]	Extended bolus when it is relevant (e.g., low blood sugar before a meal)	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
basal1 [if pumptype ≠ 2, 11 or 12]	Temporary basal up when it is relevant (e.g., in the case of illness)	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
basal2 [if pumptype ≠ 2, 11 or 12]	Temporary basal down when it is relevant (e.g., exercise)	1. Never/rarely 2. Occasionally 3. Often

		4. Always/almost always
[manuelfunctions_intro]	How often do you use these insulin pump functions when they are relevant, and you are in manual mode? [**Medtronic 670G users**]	1. I am almost never in manual mode besides when I change infusion set.
bolus1_670G [if pumptype = 2 and manuelfunctions_intro ≠ 1]	Combined bolus when it is relevant (e.g., fast food)	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
bolus2_670G [if pumptype = 2 and manuelfunctions_intro ≠ 1]	Extended bolus when it is relevant (e.g., low blood sugar before a meal)	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
basal1_670G [if pumptype = 2 and manuelfunctions_intro ≠ 1]	Temporary basal up when it is relevant (e.g., in the case of illness)	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
basal2_670G [if pumptype = 2 and manuelfunctions_intro ≠ 1]	Temporary basal down when it is relevant (e.g., exercise)	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
autofunctions_intro [if pumptype = 2]	How often do you use temporary target-blood sugar when relevant (e.g., exercise) and you are in auto-mode?	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
insulindosehow [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4]	When do you typically take bolus insulin for meals?	1. Before the meal (10 minutes or more) 2. Just before the meal 3. During the meal 4. After the meal
missedbolus [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4]	How often do you forget bolus insulin for meals?	1. Never 2. Once a month or less 3. Once a week or less 4. Twice a week 5. 3-4 times a week 6. 5-6 times a week 7. At least once a day
carbhow [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4]	How do you typically enter carbohydrates into the insulin pump?	1. I typically enter the estimated/calculated amount of carbohydrates 2. I typically enter the same amount of carbohydrates regardless of small variations in the meal 3. I never enter carbohydrates in the insulin pump
carbhow_intro [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4 and carbhow ≠ 3]	How often do you do the following when entering carbohydrates into the insulin pump? This does not include intake of carbohydrates at low blood sugar or as	

	a preventative measure before exercise.	
maincourse [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4 and carbhow ≠ 3]	I enter at main meals	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
snack1 [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4 and carbhow ≠ 3]	I enter anything over 10 g carbohydrates	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
snack2 [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4 and carbhow ≠ 3]	I enter anything over 5 g carbohydrates	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
allmeals1 [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4 and carbhow ≠ 3]	I deliberately enter more carbohydrates than the calculated amount	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
allmeals2 [if pumptype ≠ 2, 11 or 12 and bolus ≠ 4 and carbhow ≠ 3]	I deliberately enter less carbohydrates than the calculated amount	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always

Scale/item [branching logic]	Question	Response categories
The following questions are about how you use data upload from your insulin pump to your computer and how you adjust the functions of your insulin pump.		
pumpdata	How often do you transfer data from your insulin pump to your computer?	1. Never 2. Once a year or less 3. 2-5 times a year 4. Every two months 5. Once a month 6. Once a week or more often 7. Every day
pumpdata_why [if pumpdata = 3, 4, 5, 6 or 7]	Why do you transfer data from your insulin pump to your computer? Feel free to choose several reasons.	1. So that my healthcare provider can analyze the development of my blood sugar and whether the insulin pump is set correctly 2. So that I can analyze the development of my blood sugar and whether the insulin pump is set correctly 3. Other 4. Do not know
Pumpdata_why_other [if pumpdata_why = 3]	For what other reasons do you transfer data from your insulin pump to your computer?	Open-ended response
pumpdata_why [if pumpdata = 1 or 2]	Why do you never/rarely transfer data from your insulin pump to your computer at home? Feel free to choose several reasons.	1. I do not own a computer 2. I did not know it was a possibility 3. I do not know how to do it 4. Data is too hard to understand 5. It takes too long 6. The insulin pump program is not compatible with my computer 7. I prefer to keep a diabetes diary 8. I do not find the data useful 9. I do not like seeing my data 10. I do not want to share my data with an insulin pump company 11. I do not feel the need to transfer data at home 12. Other 13. Do not know
pumpdata_whynot_other [if pumpdata_why = 12]	For what other reasons do you not transfer data from your insulin pump to your computer?	Open-ended response
pumpadjust	Who primarily decides changes in your insulin pump's basic settings? E.g., carbohydrates, insulin sensitivity, basal rates.	1. My healthcare provider 2. Myself 3. My next of kin

adjustself1 [if pumpadjust = 1]	Even though it is primarily your healthcare provider who decides the settings, do you do it yourself sometimes?	1. Yes 2. No
adjustself2 [if pumpadjust = 2 or adjutself1 = 1]	When you adjust the basic settings of the insulin pump yourself, which ones do you typically adjust? Feel free to choose several options.	1. Carbohydrate ratio 2. Insulin sensitivity 3. Basal rate 4. Insulin's duration/time of action 5. Target blood sugar
daysset	How many days typically pass between you changing insulin needle/insulin catheter or pod/patch?	Drop-down menu from 1 to 10 days.

Page 5 of 28

Scale/item [branching logic] [branching logic]	Question	Response categories
The following questions are about your possible use of sensor or flash glucose measuring device.		
sensor	Are you currently using a sensor or flash glucose meter?	1. Yes 2. No
sensortype [if sensor = 1]	What sensor system do you use? You will be shown a picture of the sensor system below when you click on the name of the system.	1. Flash Libre 2. Guardian to 640/670G insulin pump 3. Minilink to Paradigm/VEO insulin pump 4. Guardian connect 5. Dexcom (G4, G5 or G6) 6. Eversense 7. Medtrum 8. Other
bgmeasure_flash [if sensor = 1 and sensortype = 1]	How often do you typically scan your Flash Libre? (press ‘menu', 'browse history' and press the down arrow to 'sensor use' on your Flash Libre to see your daily number of scans).	1. Rarer than once a day 2. 1-3 times daily 3. 4-6 times daily 4. 7-9 times daily 5. 10 or more times a day
flash_who [if sensortype = 1]	Who pays for your Flash Libre?	1. Municipality 2. The hospital/region 3. Out-of-pocket payment 4. Do not know
sensortype_other [if sensortype = 8]	What other sensor are you using?	Open-ended response
sensorstop [if sensor = 0]	Have you previously used a sensor but stopped?	1. Yes 2. No
sensorstop_why [if sensorstop = 1]	Why did you stop using a sensor? Feel free to choose several reasons.	1. Skin problems 2. Too many alarms 3. Technical problems (e.g., signal failure) 4. Not accurate enough 5. Annoying to wear 6. Attachment problems 7. Information overload 8. It was too difficult to understand and use the sensor values 9. Other 10. Do not know/do not remember
sensorstop_why_other [if sensorstop_why = 9]	What other reasons were there for you choosing to stop using a sensor?	Open-ended response

bgmeasure [if sensor = 0]	How often do you measure your blood sugar?	1. Less than once a day 2. 1-3 times daily 3. 4-6 times daily 4. 7-9 times daily 5. 10 or more times a day
sensoryear [if sensor = 1]	In which year did you get your first sensor? If you do not remember the exact year, please provide an approximate estimate	Open-ended reponse
sensorindication [if sensor = 1]	What was the reason for you originally being offered a sensor? Feel free to choose several reasons.	1. I had too high long-term blood sugar (HbA1c) 2. I had severe fluctuations in my blood sugar levels 3. I could not feel when I had low blood sugar 4. I could not make blood sugar reading work at work (e.g., due to hygiene requirements) 5. I had problems with my fingers/hands 6. Other 7. Do not know/do not remember 8. I was not offered a sensor. I bought it and continue to pay for it myself
sensorindication_other [if sensorindication = 6]	What other reasons were there for originally being offered a sensor?	Open-ended response
whysensor [if sensor = 1]	What was the reason(s) you initially agreed to use the sensor? Feel free to choose several reasons.	1. To improve my long-term blood sugar (HbA1c) 2. To achieve a more stable blood sugar level (fewer fluctuations) 3. Because I could not feel my low blood sugar 4. To feel more comfortable in general 5. I could not make blood sugar reading work at work (e.g., due to hygiene requirements) 6. I had problems with my fingers/hands

		7. To achieve better sleep 8. To follow sensor values during exercise 9. Other 10. Do not know/do not remember
whysensor_other [if whysensor = 9]	What other reasons were there, for you to agree to use/buy the sensor?	
sensor_no [if sensor = 1]	How many days are you without a sensor within a typical month?	1. Only when changing the sensor or short sensor problems/updates (0 days) 2. 1 day 3. 2-3 days 4. 4-5 days 5. 6-7 days 6. More than 7 days 7. Do not know
stoplow [if pumptype = 1, 3, 7 or 8 and sensor = 1 and pumptype ≠ 11 or 12]	Is 'stop at low' or 'stop before low' activated on your insulin pump?	1. Yes 2. No
trend_intro	The following questions are about how you use the sensor's trend arrows.	
trend1 [if sensor = 1 and pumptype ≠ 11 or 12]	How often do you eat food without bolus if the trend arrows on your sensor show a decreasing tendency?	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
trend2 [if sensor = 1 and pumptype ≠ 2, 11 or 12]	How often do you stop or reduce the basal rate if the trend arrows on your sensor show a decreasing tendency?	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
trend3 [if sensor = 1 and pumptype ≠ 2, 11 or 12]	How often do you use the trend arrows to take more or less than the insulin pump's suggestion for bolus?	1. Never/rarely 2. Occasionally 3. Often 4. Always/almost always
autoupload [if sensortype = 1, 3, 4, 5 or 6 and pumptype ≠ 11 or 12.	Do you use auto-upload via an app on your phone or tablet to read your sensor data?	1. Yes 2. No
sensordataupload [if autoupload = 0 and sensortype = 1, 3, 4, 5 or 6]	How often do you transfer data from your sensor to your computer?	1. Never 2. Once a year or fewer 3. 2-5 times a year 4. Every two months 5. Once a month 6. Once a week or more often 7. Every day 8. Not relevant

sensordataupload_whynot [if sensordataupload = 1 or 2]	Why do you never/rarely transfer data from your sensor to your computer at home? Feel free to choose several reasons.	1. I do not have a computer 2. I did not know it was a possibility 3. I do not know how to do it 4. The data are too hard to understand 5. It takes too long 6. The sensor program is not compatible with my computer 7. I prefer to keep a diabetes diary 8. I do not find the data useful 9. I do not like seeing my data 10. I do not want to share my data with a sensor company 11. I do not feel the need to transfer data at home 12. Other 13. Do not know
sensordataupload_whynot_other [if sensordataupload_whynot = 12]	What other reasons are there for you not transferring data from your sensor to your computer at home?	Open-ended response
sensorshare [if sensor = 1, 3, 4, 5, 6 or pumptype = 12.	Do you share sensor data with your next of kin using the sensor's share function?	1. Yes 2. No
sensorshare_who [if sensorshare = 1]	Which next of kin do you share your sensor data with? Feel free to choose several options.	1. Spouse/significant other 2. Children 3. Parents 4. Friends 5. Others

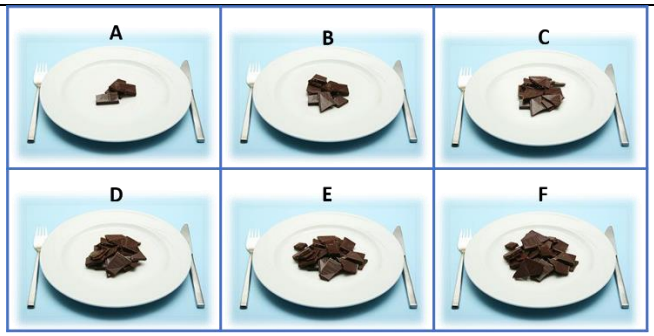
Scale/item [branching logic]	Question	Response categories
Think back to the teaching and guidance you received when you started your insulin pump treatment. By this we mean a course lasting a day or more in which you received information and guidance on insulin pump treatment and the use of the insulin pump.		
educationtime	Approximately how long t did the start-up/education last?	1. 1 day or less 2. 2-3 days 3. 3-4 days 4. Other 5. Do not remember
education_other [if educationtime = 4]	Did the start-up/education take place over a longer or shorter period? Please be specific.	Open-ended response
educationprep	How did you prepare for the insulin pump start-up? Feel free to choose several options.	1. I found information on the internet about insulin pump treatment 2. I talked to other insulin pump users in my network 3. I sought out groups on social media with insulin pump users 4. I did not seek out special information other than the information given to me by my health care provider 5. I do not remember
educationhcp	Who taught you about insulin pump start-up? Feel free to choose several options.	1. Representative from a pump company 2. Dietitian 3. Diabetes doctor 4. Diabetes nurse 5. I do not remember
educationt	How did the teaching take place?	1. I received mostly group-based lessons 2. I received mostly individual instruction 3. I do not remember
educationfam	Were your relatives invited to all or part of the education?	1. Yes 2. No 3. I do not remember
educationgroup_intro [if education = 1]	To what degree do you agree with the following statements?	
educationgroup1 [if educationt = 1]	Group education suited me well	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree

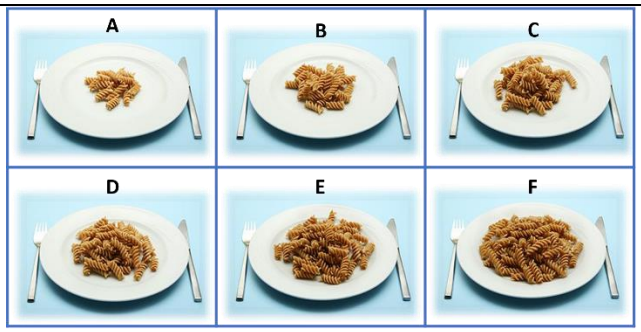
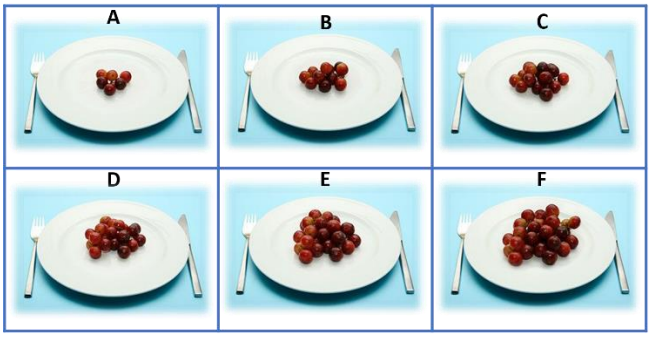
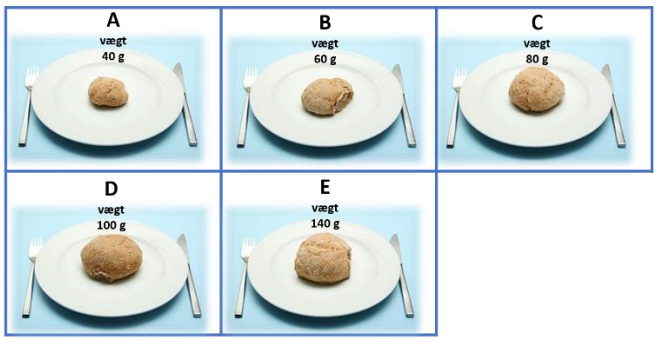
educationgroup2 [if educationt = 1]	I appreciated talking to the other participants in the group and hearing about their experiences	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationgroup3 [if educationt = 1]	I would have preferred individual education	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationgroup4 [if educationt = 1 and educationfam = 1]	I found it valuable that my next of kin could participate in all or part of the education	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationind_intro [if education = 2]	To what degree do you agree with the following statements?	
educationind1 [if education = 2]	The individual education suited me well	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationind2 [if education = 2]	I appreciated having time with the teacher alone without other participants present	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationind3 [if education = 2]	I would have preferred group training with others in the same situation	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationind4 [if education = 2 and educationfam = 1]	I found it valuable that my next of kin could participate in all or part of the teaching	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree

Scale/item [branching logic]	Question	Response categories
The following questions are about the teaching or exchange of experience you have participated in as an experienced insulin pump user.		
educationnow	Have you participated in either of these types of courses in relation to your insulin pump treatment in the past 5 years? If you have participated in both, choose the course you remember best.	1. Carbohydrate counting course in a group 2. "Refresher course" experience-sharing course about insulin pump in a group 3. No, I have not participated in such courses in the last 5 years
educationgroup2intro	To what degree do you agree with the following statements?	
educationgroup21 [educationnow = 1 or 2]	Group education suited me well	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationgroup22 [educationnow = 1 or 2]	I appreciated talking to the other participants in the group and hearing their experiences	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree
educationgroup23 [educationnow = 1 or 2]	I would have preferred individual education	1. Strongly disagree 2. Disagree 3. Neither agree nor disagree 4. Agree 5. Strongly agree

Scale/item [branching logic]	**Question**	**Response categories**
In the following we ask about your current needs for knowledge, education and experience-sharing about your insulin pump.		
knowledge1	Do you need a refresher or more knowledge about the use of the different insulin pump features?	1. No 2. Yes, to some degree 3. Yes, very much 4. I do not know
knowledge2	Do you need sparring and experience-sharing in relation to everyday-life with your insulin pump? Topics could be family life, sport, working life, travel, or the fact that you carry an insulin pump 24/7	1. No 2. Yes, to some degree 3. Yes, very much 4. I do not know
knowledge3	Do you need more practical knowledge of the upload and interpretation of data from your insulin pump and possible sensor? (With upload we mean transferring data to computer/app, e.g., blood glucose levels, sensor curves and insulin doses)	1. No 2. Yes, to some degree 3. Yes, very much 4. I do not know
knowledge4	Do you need more knowledge and/or practical training in how you can adjust the insulin pump settings yourself?	1. No 2. Yes, to some degree 3. Yes, very much 4. I do not know
knowledge5	Do you seek out knowledge about new initiatives in insulin pump treatment on, e.g., the internet or in networks with other insulin pump users outside your place of treatment?	1. No 2. Yes, to some degree 3. Yes, very much 4. I do not know

Scale/item [branching logic]	Question	Response categories
The next questions are about carbohydrate counting.		
carbcount	Do you count carbohydrates?	1. Yes 2. No
carbcount_whynot [if carbcount = 2]	Why do you not count carbohydrates? Feel free to choose several reasons.	1. I never learned it 2. It is too much of a hassle 3. I lack training/practice in it 4. I do not feel that I need it 5. Other reasons 6. I do not know
carbcount_whynot_other [if carbcount_whynot = 5]	What other reasons are there for you not counting carbohydrates?	Open-ended response
carbcounthow [if carbcount = 1]	What methods do you use to count carbohydrates? Feel free to choose several methods.	1. I eyeball 2. I use weight 3. I use an app 4. I use nutrition fact declarations 5. I use encyclopedias (e.g., carbohydrate lists) 6. I use Google 7. None of the above
carbcountlearn [if carbcount = 1]	How did you learn to count carbohydrates? Feel free to choose several reasons.	1. Individual guidance from dietitian 2. Carbohydrate counting course 3. Self-taught (e.g., from books, social media or experience-sharing with others) 4. None of the above

carbcount_intro	You now have the opportunity to participate in a carbohydrate counting challenge. If you eat the following food items occasionally or often, you will be shown a picture of different portion sizes for the given item. You must then pick the portion size you typically eat and state the amount of carbohydrates you think it contains. The rules are simple: you cannot use aids such as carbohydrate lists, apps, or nutrition fact declarations. The idea is that you simply respond based on your immediate assessment of carbohydrate content in each item. On the last page of the questionnaire, you can compare your response with the actual amount of carbohydrates in each food.	1. I would like to participate 2. I do not want to take part in the challenge
choco1 [if carbcount = 1 and carbcount_intro = 1]	How often do you eat dark chocolate?	1. Rarely/Never 2. Occasionally 3. Often
choco2 [if choco1 = 2 or 3]	Select the image that matches the portion size you typically eat. If you typically eat a larger or smaller portion than any of the shown, select the image that comes closest.	1. Portion size A 2. Portion size B 3. Portion size C 4. Portion size D 5. Portion size E 6. Portion size F
choco3 [if choco1 = 2 or 3]		
choco4 [if choco2 ≠ .]	Type the amount of carbohydrates (in grams) that are on the image you have selected.	Open-ended response
pasta1 [if choco1 = 1 or choco4 ≠ .]	How often do you eat pasta?	1. Rarely/Never 2. Occasionally 3. Often
pasta2 [if pasta1 = 2 or 3]	Select the image that matches the portion size you typically eat. If you typically eat a larger or smaller portion than any of the shown, select the image that comes closest.	1. Portion size A 2. Portion size B 3. Portion size C 4. Portion size D 5. Portion size E 6. Portion size F

pasta3 [if pasta1 = 2 or 3]		
pasta4 [if pasta2 ≠ .]	Type the amount of carbohydrates (in grams) that are on the image you have selected.	Open-ended response
grapes1 [if pasta1 = 1 or pasta4 ≠ .]	How often do you eat grapes?	1. Rarely/Never 2. Occasionally 3. Often
grapes2 [if grapes1 = 2 or 3]	Select the image that matches the portion size you typically eat. If you typically eat a larger or smaller portion than any of the shown, select the image that comes closest.	1. Portion size A 2. Portion size B 3. Portion size C 4. Portion size D 5. Portion size E 6. Portion size F
grapes3 [if grapes1 = 2 or 3]		
grapes4 [if grapes2 ≠ .]	Type the amount of carbohydrates (in grams) that are on the image you have selected.	Open-ended response
bun1 [if grapes1 = 1 or grapes4 ≠ .]	How often do you eat wholegrain bread rolls?	1. Rarely/Never 2. Occasionally 3. Often
bun2 [if bun1 = 2 or 3]	Select the image that matches the portion size you typically eat. If you typically eat a larger or smaller portion than any of the shown, select the image that comes closest.	1. Portion size A 2. Portion size B 3. Portion size C 4. Portion size D 5. Portion size E
bun3 [if bun1 = 2 or 3]		

bun4 [if bun2 ≠ .]	Type the amount of carbohydrates (in grams) that are on the image you have selected.	Open-ended response

Page 10 of 28

Scale/item [branching logic]	Question	Response categories
The following statements are about your satisfaction with your current insulin pump. Think about your everyday life with the pump and indicate the degree to which you agree or disagree with the following statements. **My insulin pump …**		
idds1	… helps me to feel more in control of my diabetes	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds2	… works well when I need it	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds3	… does not really benefit me much	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds4	… helps me feel more positive about the future	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds5	… helps me to have good blood glucose control	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds6	… is too complicated	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds7	… is too much of a hassle to use	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds8	… has too many pieces and parts to manage	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds9	… takes too much time to use	1. Strongly disagree 2. Disagree 3. Neutral

		4. Agree 5. Strongly agree
idds10	… is often embarrassing to use when I am in public	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds11	… makes it difficult to be as spontaneous as I'd like to be	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds12	… is inconvenient to use when I am away from home	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
idds13	… is a hassle to carry around	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

Scale/item [branching logic]	Question	Response categories
The following statements concern your satisfaction with your current glucose meter (e.g., blood glucose monitor or sensor). Base your answer on the meter you use the most or consider your primary meter and indicate the degree to which you agree or disagree with the following statements.		
devicetype	Please specify which glucose meter you are basing your answers on?	1. Sensor or Flash glucose meter 2. Blood sugar device
gmss_intro	My current blood glucose monitor/sensor …	
gmss1	… helps me feel more satisfied with how things are going with my diabetes	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss2	… makes me think about diabetes more than I want to	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss3	… takes too much time to use	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss4	… doesn't seem to be as accurate as I would like it to be	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss5	… makes me worry a lot	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss6	… is too much of a hassle to use	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss7	… gives me numbers that I don't entirely trust	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss8	… helps me feel less restricted by diabetes	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree

		5. Strongly agree
gmss9	… makes me feel more frustrated with my diabetes	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss10	… helps me to be more spontaneous in daily life	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss11	… Causes too many skin irritations or bruises	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss12	… often gives me results that don't make sense	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss13	… makes me feel more down and depressed	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss14	… helps me to be more open to new experiences in life	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
gmss15	… is too painful to use	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

Scale/item [branching logic]	Question	Response categories
We would like to know how you experience wearing the insulin pump on your body.		
bodyimageintro1	**Please indicate the degree to which you agree or disagree with the following statements:**	
bodyimage1	The insulin pump makes me feel me different in the eyes of others	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
bodyimage2	It bothers me that I always have an insulin catheter in my body	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
bodyimage3	With the insulin pump, others immediately notice that I have diabetes	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
bodyimage4	The insulin pump makes me less attractive	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
bodyimageintro2	**Please indicate the degree to which you agree or disagree with the following statements:**	
bodyimage5	The insulin pump bothers me when I sleep	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
bodyimage6	The insulin pump bothers me when I exercise	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
bodyimage7	The insulin pump bothers me when I have sex	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree

		5. Strongly agree
bodyimage8	The insulin pump prohibits me from wearing the clothes that I want to wear	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree

Scale/item [branching logic]	**Question**	**Response categories**
In the following, we ask about your general health behavior, including exercise, diet and alcohol habits as well as smoking status.		
exercise1	In a normal week, how much time do you spend doing physical activities that cause you to be short of breath (e.g., running, gymnastics, or ball games)?	1. 0 minutes / No time 2. Less than 30 minutes 3. 30-60 minutes (0.5-1 hour) 4. 60-90 minutes (1-1.5 hours) 5. 90-120 minutes (1.5-2 hours) 6. 120-150 minutes (2-2.5 hours) 7. More than 150 minutes
exercise2	In a normal week, how much time do you spend doing everyday exercise (e.g., walking, cycling or manual labor)?	1. 0 minutes / No time 2. Less than 30 minutes 3. 30-60 minutes (0.5-1 hour) 4. 60-90 minutes (1-1.5 hours) 5. 90-150 minutes (1.5-2.5 hours) 6. 150-300 minutes (2.5-5 hours) 7. More than 300 minutes (5 hours)
exercise3	How much time do you spend sitting down on a regular day when sleep is not included?	1. Pretty much all day 2. 13-15 hours 3. 10-12 hours 4. 7-9 hours 5. 4-6 hours 6. 1-3 hours 7. No time
diet1	How many vegetables do you eat (raw or prepared)? Think in servings, e.g., a carrot or 100 g fried vegetables. If you eat both a carrot and 100 g of fried vegetables, you have eaten two servings.	1. 6 a day or more 2. 5-6 a day 3. 3-4 a day 4. 1-2 a day 5. 5-6 a week 6. 3-4 a week 7. 1-2 a week

		8. Fewer or none
diet2	How much fruit do you eat? Think in servings, e.g., an apple or 10 grapes.	1. 6 a day or more 2. 5-6 a day 3. 3-4 a day 4. 1-2 a day 5. 5-6 a week 6. 3-4 a week 7. 1-2 a week 8. Fewer or none
diet3	How often do you eat whole grains? Whole grain foods include, e.g., oatmeal, rye bread, whole grain bread or whole grain pasta.	1. More than 2 times a day 2. 1-2 times a day 3. 4-6 times a week 4. 1-3 times a week 5. Rarely or never
diet4	How often do you eat fish (fresh, prepared, or canned)?	1. More than once a day 2. 5-7 times a week 3. 3-4 times a week 4. 1-2 times a week 5. Rarely or never
diet5	Do you follow The Danish Health Authority's recommendation to eat less saturated fat and choose plant oil instead? Recommendation: Choose lean meat and lean dairy products, and limit the amount of butter, whole-fat cheeses and cream. Use plant oil/liquid margarine in cooking.	1. Almost always 2. Usually 3. Occasionally 4. Rarely 5. Never
diet6	To the best of your knowledge, how often does is your intake of fast carbohydrates in the form of, e.g., candy, cake, ice cream and other sweets so great that it causes a prolonged blood sugar increase?	1. Never or very rarely 2. Rarely (about once a month) 3. Occasionally (a few times a month) 4. Often (1-2 times a week) 5. Very often (daily or almost daily)
alcohol	How much beer, wine, and/or spirits do you drink on average per week? Please reply in units of alcohol (1 unit equals, e.g., 1 beer, 1 glass of wine, 1 schnapps or 1 shot).	1. I do not drink 2. 1-7 units 3. 8-14 units 4. 14-21 units 5. More than 21 units
smoking	Do you smoke?	1. No 2. Yes, daily 3. Yes, occasionally 4. Former smoker

Scale/item [branching logic]	Question	Response categories
The next questions are about low blood sugars. We would like to stress that your responses to the following questions will not be shared with your health care provider.		
hypobehavior_intro	Here are five statements about things people with diabetes sometimes do to avoid low blood sugar and consequences of it. Please specify what you have done the last month in your everyday life to AVOID low blood sugar and its effects. To avoid low blood sugar and the repercussions of it, I have ...	
hypob1	... limited my out of town travel	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypob2	... avoided visiting friends	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypob3	... made sure there were other people around	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypob4	... kept my blood sugar higher than usual in social situations	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypob5	... kept my blood sugar higher than usual while doing important tasks	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypoworry_intro	Here are six statements about concerns that people with diabetes sometimes have due to low blood sugar. Please indicate how often during the past month you have been CONCERNED about each statement due to low blood sugar. Because my blood sugar could drop, I was worried about ...	

hypow1	... not to recognizing I was having a low blood sugar	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypow2	... passing out in public	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypow3	... having a hypoglycemic episode while driving	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypow4	... low blood glucose interfering with important things I was doing	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypow5	... becoming hypoglycemic during sleep	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always
hypow6	… getting emotionally upset and difficult to deal with	1. Never 2. Rarely 3. Sometimes 4. Often 5. Almost always

Scale/item [branching logic]	Question	Response categories
Below is a list of statements about various forms of concern that many people with type 1 diabetes experience. **We ask you to assess the extent to which each of the following statements has been a problem for you within the past month.**		
dds1	Feeling that I am not as skilled at managing diabetes as I should be	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds2	Feeling that I don't eat as carefully as I probably should	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds3	Feeling that I don't notice the warning signs of hypoglycemia as well as I used to	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds4	Feeling that people treat me differently when they find out I have diabetes	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds5	Feeling discouraged when I see high blood glucose numbers that I can't explain	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds6	Feeling that my family and friends make a bigger deal out of diabetes than they should	1. Not a problem 2. A slight problem

		3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds7	Feeling that I can't tell my diabetes doctor what is really on my mind	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds8	Feeling that I am not taking as much insulin as I should	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds9	Feeling that there is too much diabetes equipment and stuff I must always have with me	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds10	Feeling like I have to hide my diabetes from other people	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds11	Feeling that my friends and family worry more about hypoglycemia than I want them to	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds12	Feeling that I don't check my blood glucose level as often as I probably should	1. Not a problem 2. A slight problem 3. A moderate problem

		4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds13	Feeling worried that I will develop serious long-term complications, no matter how hard I try	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds14	Feeling that I don't get help I really need from my diabetes doctor about managing diabetes	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds15	Feeling frightened that I could have a serious hypoglycemic event when I'm asleep	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds16	Feeling that thoughts about food and eating control my life	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds17	Feeling that my friends or family treat me as if I were more fragile or sicker than I really am	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds18	Feeling that my diabetes doctor doesn't really understand what it's like to have diabetes	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem

		5. A serious problem 6. A very serious problem
dds19	Feeling concerned that diabetes may make me less attractive to employers	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds20	Feeling that my friends or family act like “diabetes police” (bother me too much)	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds21	Feeling that I’ve got to be perfect with my diabetes management	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds22	Feeling frightened that I could have a serious hypoglycemic event while driving	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds23	Feeling that my eating is out of control	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds24	Feeling that people will think less of me if they knew I had diabetes	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem

		6. A very serious problem
dds25	Feeling that no matter how hard I try with my diabetes, it will never be good enough	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds26	Feeling that my diabetes doctor doesn't know enough about diabetes and diabetes care	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds27	Feeling that I can't ever be safe from the possibility of a serious hypoglycemic event	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds28	Feeling that I don't give my diabetes as much attention as I probably should	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem
dds29	Feeling that I can't do my job because of my diabetes	1. Not a problem 2. A slight problem 3. A moderate problem 4. A somewhat serious problem 5. A serious problem 6. A very serious problem

Scale/item [branching logic]	Question	Response categories
How supportive have the following people been in helping you to manage your diabetes in the past month?		
sos1	Your family	1. Not supportive 2. Somewhat supportive 3. Very supportive 4. Do not have these (not relevant with support from here)
sos2	Friends or other people close to you	1. Not supportive 2. Somewhat supportive 3. Very supportive 4. Do not have these (not relevant with support from here)
sos3	People at your place of work or study	1. Not supportive 2. Somewhat supportive 3. Very supportive 4. Do not have these (not relevant with support from here)
sos4	Your diabetes healthcare provider	1. Not supportive 2. Somewhat supportive 3. Very supportive 4. Do not have these (not relevant with support from here)
sos5	Other people with type 1 diabetes	1. Not supportive 2. Somewhat supportive 3. Very supportive 4. Do not have these (not relevant with support from here)
sos6	People on social media (e.g. in Facebook groups for people with type 1 diabetes)	1. Not supportive 2. Somewhat supportive 3. Very supportive 4. Do not have these (not relevant with support from here)

Scale/item [branching logic]	Question	Response categories
We want to know how you perceive your own abilities to do and achieve the things you want to in your life with diabetes. **Please state to what degree the following statements fit you.**		
selfeffi1	I can always manage to solve difficult problems if I try hard enough	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi2	If someone opposes me, I can find the means and ways to get what I want	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi3	It is easy for me to stick to my aims and accomplish my goals	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi4	I am confident that I could deal efficiently with unexpected events	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi5	Thanks to my resourcefulness, I know how to handle unforeseen situations	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi6	I can solve most problems if I invest the necessary effort	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi7	I can remain calm when facing difficulties because I can rely on my coping abilities	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi8	When I am confronted with a problem, I can usually find several solutions	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi9	If I am in trouble, I can usually think of a solution	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true
selfeffi10	I can usually handle whatever comes my way	1. Not at all true 2. Hardly true 3. Moderately true 4. Exactly true

Scale/item [branching logic]	**Question**	**Response categories**
Long-term blood glucose (HbA1c)		
hba1c_intro	What long-term blood sugar level (HbA1c) would you yourself like to be at? You can enter your answer in either % or mmol/mol by indicating your preference here.	1. % 2. mmol/mol 3. I have not set myself a fixed goal for HbA1c
hba1c_goal_percent [if hba1c_intro = 1]	HbA1c (%)	Open-ended response
hba1c_goal_mmol [if hba1c_intro = 2]	HbA1c (mmol/mol)	Open-ended response
hba1c_realistic [if hba1c_intro ≠ 3]	How likely do you think it is that you will have achieved/stayed on that particular long-term blood sugar level (HbA1c) in a year? Please indicate your answer on a scale from 0-10.	0. Completely unlikely 10. Completely likely

Page 19 of 28

Scale/item [branching logic]	Question	Response categories
The next questions are more about your general health and overall satisfaction with life.		
healthstatus	How good or bad do you consider your health today? Please indicate your answer on a scale from 0-10.	0. Very bad 10. Very good
satisfaction	How satisfied are you with your life today all things considered? Please indicate your answer on a scale from 0-10.	0. Not at all satisfied 10. Completely satisfied
who5_intro	Please indicate for each of the 5 statements which is closest to how you have been feeling over the past 2 weeks. Over the past 2 weeks …	
who51	... I have felt cheerful and in good spirits	1. All of the time 2. Most of the time 3. More than half the time 4. Less than half the time 5. Some of the time 6. At no time
who52	... I have felt calm and relaxed	1. All of the time 2. Most of the time 3. More than half the time 4. Less than half the time 5. Some of the time 6. At no time
who53	... I have felt active and vigorous	1. All of the time 2. Most of the time 3. More than half the time 4. Less than half the time 5. Some of the time 6. At no time
who54	... I woke up feeling fresh and rested	1. All of the time 2. Most of the time 3. More than half the time 4. Less than half the time 5. Some of the time 6. At no time
who55	... my daily life has been filled with things that interest me	1. All of the time

		2. Most of the time 3. More than half the time 4. Less than half the time 5. Some of the time 6. At no time

Scale/item [branching logic]	Question	Response categories
The COVID-19 pandemic may impact the lives and opportunities of insulin pump users in relation to treatment and education.		
covid19_intro	How is the COVID-19 pandemic CURRENTLY impacting the following aspects of your life?	
covid1	Your diabetes	1. Very negative impact 2. Negative impact 3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid2	Your sleep	1. Very negative impact 2. Negative impact 3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid3	Your physical health	1. Very negative impact 2. Negative impact 3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid4	Your emotional wellbeing	1. Very negative impact 2. Negative impact

		3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid5	Your financial situation	1. Very negative impact 2. Negative impact 3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid6	Your relationship with your family, friends and peers	1. Very negative impact 2. Negative impact 3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid7	Your leisure activities	1. Very negative impact 2. Negative impact 3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid8	Your work or studies	1. Very negative impact 2. Negative impact 3. Slightly negative impact

		4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covid9	Your feelings about the future	1. Very negative impact 2. Negative impact 3. Slightly negative impact 4. No impact 5. Slightly positive impact 6. Very positive impact 7. Not applicable
covidrisk	How likely do you think it is for you to be become seriously ill if you get infected with the COVID-19 virus? Please indicate your answer on a scale from 0-10.	0. Completely unlikely 10. Completely likely

Page 21 of 28

Scale/item [branching logic]	Question	Response categories
You are now finished with the part of the questionnaire about your diabetes and your insulin pump. **We hope you also want to answer the next questions, which are more about you in general terms. Your answer to these questions will be used to gain an understanding of how people make decisions.** **The questions are not a test and there are no right or wrong answers.**		
lottery	Imagine that you unexpectedly inherit 2,500 kr from a distant relative. You then get the opportunity to participate in a lottery with an equal chance of either doubling the money to 5,000 kr. or losing the money. This means that there is a 50% chance that you will walk away with 5,000 kr. and a 50% chance of losing the 2,500 kr. Which choice would you make in this scenario?	1. I choose to participate in the lottery 2. I choose not to participate in the lottery and keep the 2,500 kr.

Scale/item [branching logic]	Question	Response categories
Where do you stand with regards to taking risks?		
risk1	Are you someone who is willing to take risks in general? Please indicate your answer on a scale from 0-10.	0. Fully unwilling 10. Fully willing
risk2	Are you someone who is willing to take risks with your health in general? Please indicate your answer on a scale from 0-10.	0. Fully unwilling 10. Fully willing
risk3	Are you someone who is willing to take risks with your financial situation? Please indicate your answer on a scale from 0-10.	0. Fully unwilling 10. Fully willing

Scale/item [branching logic]	Question	Response categories
How patient and impulsive are you?		
patience	In general, how patient are you? Please indicate your answer on a scale from 0-10.	0. Very impatient 10. Very patient
impulsive	Are you a person who generally acts impulsively, or do you think a lot about things before you act? Please indicate your answer on a scale from 0-10.	0. Not impulsive at all 10. Very impulsive
riskage	Think about the future. How likely do you think it is that you will experience your 90th birthday? Please indicate your answer on a scale from 0-10.	0. Completely unlikely 10. Completely likely

Scale/item [branching logic]	**Question**	**Response categories**
liveplando_intro	To what degree do you agree with the following statements?	
livelife	I live life one day at a time and do not think too much about my future	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
planlife	I plan everything in good time	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree
dolife	When I set a goal for myself, I always achieve it	1. Strongly disagree 2. Disagree 3. Neither disagree nor agree 4. Agree 5. Strongly agree

Page 25 of 28

Scale/item [branching logic]	Question	Response categories
The following questions are about time and money. **The questions are not a test and there are no right or wrong answers.**		
priselist_intro1	Imagine that you can choose between getting 5,000 kr. today or another amount in 1 year. What amount do you prefer in each of the following seven situations? The money is yours no matter what, and there is no risk of you losing a future amount if you choose to wait. We have filled out the first answer for you as we believe you would prefer to have 5,000 kr. in your hand today rather than in 1 year.	
pricelist1		1. 5,000 kr. today 2. 5,000 kr. in a year
pricelist2		1. 5,000 kr. today 2. 5,100 kr. in a year
pricelist3		1. 5,000 kr. today 2. 5,250 kr. in a year
pricelist4		1. 5,000 kr. today 2. 5,500 kr. in a year
pricelist5		1. 5,000 kr. today 2. 6,000 kr. in a year
pricelist6		1. 5,000 kr. today 2. 7000 kr. in a year
pricelist7		1. 5,000 kr. today 2. 9000 kr. in a year

Scale/item [branching logic]	Question	Response categories
The next questions are like the previous, only now the time horizon varies. **How much would you require in addition to the 5,000 kr. to wait for the money in each scenario?** **There are no right or wrong answers.** **When you enter an amount, the total sum is calculated in the following field, and you therefore do not have to write anything in this field.**		
tp1	How much money would you require in addition to the 5,000 kr. if you had to wait 1 month to get the money?	Open-ended response
tp1_calc [if tp1 ≠ .]	This means that instead of 5,000 kr. today, you will get…	X kr. in 1 month
tp2	Against waiting 3 months?	Open-ended response
tp2_calc [if tp2 ≠ .]	This means that instead of 5,000 kr. today, you will get	X kr. in 3 months
tp3	Against waiting 6 months?	Open-ended response
tp3_calc [if tp3 ≠ .]	This means that instead of 5,000 kr. today, you will get	X kr. in 6 months
tp4	Against waiting 12 months?	Open-ended response
tp4_calc [if tp4 ≠ .]	This means that instead of 5,000 kr. today, you will get	X kr. in 12 months
tp5	Against waiting 24 months?	Open-ended response
tp5_calc [if tp5 ≠ .]	This means that instead of 5,000 kr. today, you will get	X kr. in 24 months

Page 27 of 28

Scale/item [branching logic]	Question	Response categories
Now imagine a situation where you cannot get the 5,000 kr. before 12 months from now.		
tp24	How much money would you require in addition to the 5,000 kr. in 12 months for you to wait another 12 months to get the money?	Open-ended response
tp24_calc	This means that instead of getting 5,000 kr. in 12 months you will get	X kr. in 24 months

Page 28 of 28

Scale/item [branching logic]	Question	Response categories
Thank you so much for your help! **Your reply will help us to learn more about how people with type 1 diabetes use and live with their insulin pump. We will use this knowledge to improve treatment options for insulin pump users at Nordsjællands Hospital Hillerød and Steno Diabetes Center Copenhagen.**		
sdccnoh	Are you treated at Nordsjællands Hospital Hillerød or Steno Diabetes Center Copenhagen?	1. Nordsjællands Hospital Hillerød 2. Steno Diabetes Center Copenhagen
contact	Can we send you a similar questionnaire in a year?	1. Yes 2. No
panel	At Steno Diabetes Center Copenhagen, we carry out numerous research projects with different research subjects on an ongoing basis. In the context of this, we have been given permission to create a register of people interested in participating in new research projects. By ticking here, you agree that we may contact you with information about the possibility of participation in upcoming research projects/trials. Your consent is valid for 1 year. You can say no to participating in the trials at any time, just as you can always withdraw your consent to be included in the register.	1. Yes, I would like to be included in the register and contacted via e-Boks when new research projects come in 2. Yes, I would like to be included in the register and contacted via e-Boks and/or phone when new research projects come in. 3. I do not want to be part of the register
phone [if panel = 2]	Please provide a phone number we may contact you at. Enter only the 8 digits.	Open-ended response.
carbcountanswer_intro	Bonus info: fact list for the carbohydrate counting exercise!	
carbcountanswer1	Chocolate: You replied that there are [choco4] grams of carbohydrates in the chocolate in the selected image. The exact amount of carbohydrates is:	X
carbcountanswer2	Pasta: You replied that there is [pasta4] grams of carbohydrates in the pasta in the selected image. The exact amount of carbohydrates is:	X
carbcountanswer3	Grapes: You replied that there are [grapes4] grams of carbohydrates in the grapes in the selected image. The exact amount of carbohydrates is:	X
carbcountanswer4	Buns: You replied that there are [bun4] grams of carbohydrates in the bread roll on the selected image. The exact amount of carbohydrates is:	X