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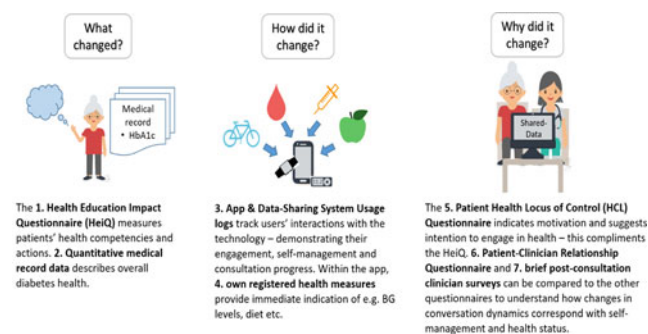


Figure 1: Framework for choosing measures (1-7) for evaluating what, how and why an mHealth data-sharing system impacts patients and clinicians.

that the chosen measures better explain what, why and how an mHealth data-sharing intervention impacts diabetes self-management and treatment.

**Conclusion:** mHealth intervention assessment should not be limited to clinical measures. Measures that reflect patients' engagement, e.g. usage logs, health competence and health beliefs should be added to better understand why and how self-management and health status are affected by mHealth interventions.

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## Informatics in the Service of Medicine; Telemedicine, Software and other Technologies

ATTD8-0324

### MOBILE APPLICATION “EUGLYCA” IN MANAGEMENT OF DIABETES MELLITUS TYPE 1 IN CHILDREN AND ADOLESCENTS

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**Background and Aims:** We developed <<Euglyca>>, a mobile application which calculate the amount of carbohydrates and lipids that a patient consumes during a meal and by taking into consideration eight more parameters calculates the required

bolus dose of insulin. Aim of this study is to evaluate the efficacy of this application on patient's glycemic control and satisfaction.

**Method:** 80 children and adolescents with T1DM were randomly assigned in two groups. 40 of them used the application and the rest were controls. At the baseline, three months and 6 months later, Glycosilated Hamoglobin (HbA1c) levels were determined and amount of hypoglycemias, hyperglycemias and normoglycemias were calculated. In addition, Diabetes Treatment Satisfaction (DTSQ) was used to assess patient's satisfaction.

**Results:** In the target group HbA1c dropped from  $7.8 \pm 0.75$  at baseline to  $7.05 \pm 0.59$  in 3 months and  $6.9 \pm 0.61$  in 6 months. In the control group HbA1c rose from  $7.5 \pm 0.91$  to  $7.8 \pm 0.83$  and  $7.9 \pm 0.8$  at the same period. At the baseline there was no statistically significant difference ( $p=0.279$ ), while at 3 and 6 months there was,  $p=0.011$  and  $p<0.001$  respectively.

In the target group Normoglycemias increased from  $48.3\% \pm 10.9$  at baseline to  $62.3\% \pm 10.2$  in 3 months and  $58.3 \pm 10.1$  in 6 months ( $p<0.05$ ). At the same period, hyperglycemias decreased from  $38.7\% \pm 11.2$  to  $28.5\% \pm 8.9$  and  $30.5\% \pm 11.1$  respectively ( $p<0.05$ ).

In the control group Normoglycemias fell from  $52.3\% \pm 11.8$  to  $48.4\% \pm 12$  and  $46.8\% \pm 13.3$  while hyperglycemias rose from  $37.4\% \pm 12.6$  to  $39.3\% \pm 13.1$  and  $41.3\% \pm 13.7$ .

Improvement in patient's satisfaction is noted in the target group.

**Conclusion:** “Euglyca” improves the glycemic control and satisfaction of children and adolescents with T1DM.

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## Informatics in the Service of Medicine; Telemedicine, Software and other Technologies

ATTD8-0396

### RESULTS OF THE MULTI-CENTRIC STUDY RENACED DIABETES TIPO 1 IN MEXICO

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**Background and Aims:** Information regarding type 1 diabetes (T1D) patients follow-up in Mexico is limited. An online-system, RENACED DT1, registers longitudinal T1D data in Mexico.

**Method:** Descriptive analysis of 894 T1D patients registered on RENACED DT1, in 17 Mexican States, until 10/8/2017.

**Results:** Fifty percent patients were diagnosed in last 10 years, 59% women and 41% men. Average age at diagnosis was 12.5 years old (yo), being men 2 years younger than women (11.78 vs. 13.02,  $p=0.0289$ ). At the time of analysis, 860 patients remain active, with a ratio women:men of 1.5. Their average age was 24.6 yo, being women significantly ( $p=0.0268$ ) older than men (25.4 vs. 23.4); 12% have family history of T1D and 57.5% of T2D. Mean BMI was 22.3 Kg/m<sup>2</sup> and mean HbA1c was 8.5%. Thirty-eight percent of patients performs SMBG  $\geq 4$  times/day, 23% uses insulin-pump and 66% MDI. Performing SMBG  $\geq 4$  times/day, results in lower HbA1c (8.08; CI95% 7.9–8.3) than monitoring less (8.7; CI 95% 8.4–8.9;  $p<0.05$ ). Lower HbA1c ( $<0.05$ ) was observed in CGM users (8.0; CI 95% 7.5–8.5 vs. 8.8; CI 95% 8.5–9.0). A total of 20.9% and 12.1% of patients had HbA1c $<7\%$  and  $7<7.5\%$ , respectively. The presence of mild/moderate hypoglycemia was high at 74.6%, severe hypoglycemia, 26.3%, and chronic complications, 12.2%.

**Conclusion:** The percentage of T1D patients in Mexico that reach the HbA1c target is low (20.9%  $<7\%$  and 33%  $<7.5\%$ ), but similar to that described in the literature. Improved glucose monitoring technology, insulin delivery systems and adjunctive therapy are necessary to improve glycemic control in T1D patients.

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### Insulin Pumps

ATTD8-0409

### EFFICACY AND SAFETY OF SENSOR-AUGMENTED INSULIN PUMP THERAPY WITH LOW-GLUCOSE SUSPEND FEATURE IN OLDER ADULTS

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**Background and Aims:** Life expectancy is increasing worldwide, it is therefore essential to maintain functionality, improve quality of life and decrease incidence of complications. We evaluated efficacy and safety of sensor augmented insulin pump therapy (SAP) in older adults.

**Method:** Before and after study. Patients with Type 1 and 2 diabetes mellitus (DM) with preserved basic functionality by Barthel index and clinically, evaluating capability of self-administration of insulin, carbohydrate counting and smartphone usage. Participants with adequate social network support and who had been using SAP for at least 3 months were included. Data was analyzed from a cohort of SAP users recruited from 2008 to 2014 at Diabetic Clinic of Hospital Universitario San Ignacio in Bogotá, Colombia, a tertiary level referral center. Efficacy was assessed with A1C and safety by frequency of hypoglycemia. There were also addressed body mass index, number of hospitalizations, severe hypoglycemia episodes and self-rated health (SRH).

**Results:** 50 patients were included, 26 were younger adults and 24 older adults ( $\geq 60$  years), mean age was 38 and 69.7 years-of-age for younger and older adults respectively. 58.3% of older adults had Type 2 DM and after SAP, number of hospitalizations (12.85% vs 33%), severe hypoglycemia (66.67% vs. 0%) and A1c ( $9.06 \pm 1.69$  vs.  $7.27 \pm 0.87$ ) significantly decreased and a significant improvement of SPH was found ( $46.08 \pm 24.30$  vs.  $82.69 \pm 18.86$ ) ( $p<0.05$ ). No statistically significant differences were found in A1C comparing older and younger adults.

**Conclusion:** Integrated systems in older adults led to a significant decrease in A1c and severe hypoglycemia episodes.

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### New Insulin Analogues

ATTD8-0420

### HYPOGLYCEMIA RISK ASSOCIATED WITH BASAL INSULIN USE IN TYPE 2 DIABETES (T2DM): THE LIGHTNING STUDY

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**Background and Aims:** The Lightning study aims to utilize real-world electronic health record data, representative of the general population and real-life practice, to assess hypoglycemia rates in patients with type 2 diabetes (T2DM) prescribed first-generation (glargine 100 U/mL [Gla-100], detemir [IDet]) or second-generation (degludec [IDeg], glargine 300 U/mL [Gla-300]) basal insulin (BI) analogs.

**Method:** We collected data for BI treatments between April 1, 2015 and December 31, 2016. This preliminary analysis

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### Informatics in the Service of Medicine; Telemedicine, Software and other Technologies

ATTD8-0397

#### INSULIN RESISTANCE ASSOCIATED CHARACTERISTICS IN T1D PATIENTS 20 YEARS AND OLDER IN MEXICO. RESULTS FROM THE MULTI-CENTRIC STUDY RENACED DIABETES TIPO I

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**Background and Aims:** Information regarding the prevalence of some insulin resistance (IR) associated characteristics in type 1 diabetes (T1D) patients during adulthood, in Mexico, is limited. We studied adult patients registered in RENACED DT1.

**Method:** The gold standard to measure IR is the hyperinsulinemic euglycemic clamp, usually done in a clinical research center. Clinical surrogates of IR include body weight, BMI, waist circumference, hypertension, HDL, triglycerides, and insulin dose. We analyzed the presence of these characteristics in 486 T1D patients  $\geq 20$  years-old registered on RENACED DT1, until 10/8/2017.

**Results:** Sixty-two percent of patients were women, 37.6% men, with a mean age of 32.8 years-old. Average diagnosis age was 16 years, 52% have family history of T2D. Mean BMI was 24.8 Kg/m<sup>2</sup> (n=412), 29% were overweight and 11% were obese. 12.5% had diagnosed hypertension. 21.9% had triglyceride levels  $\geq 150$  mg/dl and 19.1% had HDL levels  $< 40$  mg/dl. Mean HbA1c was 8.5% (n=377). Regarding insulin dose, 13% of the patients use  $1.0 < 1.5$  U/kg/day, and 1.3% use  $\geq 1.5$  U/kg/day. Only 40% of patients with HbA1c  $\geq 9.0\%$  exercised vs 67% of patients with  $< 7.0\%$  ( $< 0.0001$ ). Thirteen percent of patients are on metformin therapy, those have lower HbA1c levels, but the difference was not significant (8.18 vs. 8.55).

**Conclusion:** A large proportion (40%) of adult patients living with T1D in Mexico are overweight or obese, and have some associated features associated with IR. Adjunctive therapies are needed to help improve glycemic control and reduce IR, and therefore reduce cardiovascular risk.

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### Informatics in the Service of Medicine; Telemedicine, Software and other Technologies

ATTD8-0282

#### SOFTWARE TOOL FOR GLUCOSE VARIABILITY ANALYSIS FROM CONTINUOUS GLUCOSE MONITORING DATA

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**Background and Aims:** In the last decade, multiple studies have shown the association between glucose variability (GV) and hypoglycemia. In this regard, different GV metrics and software tools

