Individualizing Therapy in T2DM With Insulin

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OBJECTIVES:

At the conclusion of this activity, participants should be able to:

- Compare the pharmacodynamic and therapeutic characteristics of ultralong-acting basal insulins with those of previously approved insulins
- Identify simplified, patient-centered treatment regimens incorporating ultralong-acting insulin for advancing therapy in patients with T2DM
- Using New Technologies to identify glycemic variability and hypoglycemia
T2DM Is a Progressive Disease

Disease progression occurs *no matter how well* patients self-manage: insulin therapy should not be used as a threat or described as failure

Insulin Is the Universal Agent for Achieving Glycemic Control

At diagnosis

- Benefit especially likely in:
  - Treatment-naive individuals with hyperglycemic symptoms and A1C > 9%
  - Latent autoimmune diabetes in adults (LADA)
  - Individuals with hyperlipidemia and/or hypertension

In combination with non-insulin agents

- Recommended for use in combination with most other major classes of antihyperglycemic agents
- Combinations reduce glycemic variability compared with insulin-only regimens

In long-duration disease

- Loss of β-cell function is inevitable as T2DM progresses
- With appropriate dose adjustment, insulin can be used in any patient (including those with comorbidities that preclude the use of other agents)

Benefits and Limitations of Early Initiation of Insulin Therapy vs Conventional Care

**Benefit:**
Rapid normalization of blood glucose levels

**Benefit:**
Reduces risk of progression from prediabetes to T2DM

**Benefit:**
Consistently better long-term glycemic control

**Benefit:**
Reduces risk of microvascular complications if A1C > 6.4%

**Benefit:**
No increased CVD risk

**Limitation:**
Increased risk of severe hypoglycemia

# Current Options Among Insulin Products

<table>
<thead>
<tr>
<th>Type</th>
<th>Basal Insulins</th>
<th>Prandial Insulins</th>
<th>Premixed Insulins</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>• U-100 NPH</td>
<td>• U-100 regular human insulin (RHI)</td>
<td>• U-100 70/30 RHI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• U-500 RHI</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Technosphere inhaled insulin</td>
<td></td>
</tr>
<tr>
<td><strong>Analogue</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>• U-100 glargine</td>
<td>• U-100 lispro</td>
<td>• U-100 50/50 lispro</td>
</tr>
<tr>
<td></td>
<td>• U-100 glargine equivalent&lt;sup&gt;a&lt;/sup&gt;</td>
<td>• U-100 aspart</td>
<td>• U-100 70/30 aspart</td>
</tr>
<tr>
<td></td>
<td>• U-100 detemir</td>
<td>• U-100 glulisine</td>
<td>• U-100 75/25 lispro</td>
</tr>
<tr>
<td></td>
<td>• U-100 degludec</td>
<td>• U-200 lispro</td>
<td>• U-100 70/30 degludec/aspart</td>
</tr>
<tr>
<td></td>
<td>• U-300 glargine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- All recently approved insulins are *only* available in pens,<sup>1,e</sup> red text denotes which insulins are *only* available in prefilled pens.
- Analogue insulins are associated with less hypoglycemia than human insulins, although these differences are not always statistically significant.<sup>2</sup>

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<sup>a</sup> In the US, U-100 glargine equivalent is not approved as a biosimilar product.<sup>3</sup>

Comparing the Therapeutic Characteristics of Older and Newer Basal Insulins
Ultralong-Acting Basal Insulins Have Minimal Glycemic Variability


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**U-300 glargine**

- Period 1
- Period 2

Average glucose infusion rate (GIR)

- Time, h
- GIR, mg/kg/min
- 0 6 12 18 24
- GIR, μmol/kg/min
- 0 2 4 6 8

**U-100 degludec**

- Individual patient profiles
- Mean profile

**Older Basals**

- NPH
- Detemir
- Glargine

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a 2-period crossover study in T1DM; n = 50.
b 3-period crossover study in T2DM.
Insulin Glargine U300

- Concentrated insulin with smaller depot surface area\textsuperscript{[a]}
- Flatter, prolonged PK and PD profiles and more consistency\textsuperscript{[b,c]}
- Onset is 6 h, half-life is $\sim$23 h, duration $\leq$ 36 h, steady state is 4 d\textsuperscript{[c]}
  - FDA-approved February 25, 2015

EDITION 2: Glargine U300 vs U100*

**Hypoglycemia**

- GLAR U100
- GLAR U300

Cumulative Number of Confirmed or Severe Hypoglycemic Events/Participant

![Graph showing hypoglycemia comparison between GLAR U100 and GLAR U300.]

**Weight Change**

- GLAR U100
- GLAR U300

![Graph showing weight change comparison between GLAR U100 and GLAR U300.]

Glargine U300 yields less hypoglycemia and weight gain

*811 patients with T2D; baseline weight, 98.0 kg to 98.7 kg; mean BMI = 34.8 kg/m²; hypoglycemia defined per ADA criteria (assistance needed or confirmed BG ≤ 70 mg/dL). Yki-Jarvinen H, et al. Diabetes Care. 2014;37:3235-3243.*
EDITION Pooled Analysis

- Pooled analysis of the EDITION 1, 2, and 3 studies with > 2400 participants with T2D, glargine U300 vs U100 demonstrated:
  - Comparable improvement in glycemic control
  - Significantly lower confirmed (≤ 70 mg/dL) and/or severe hypoglycemia at any time within 24 h, including at night
  - Weight gain was low in both groups:
    - U300 (0.51 kg) and U100 (0.79 kg); \( P = .039 \)
  - 12% increase in mean insulin dose at 6 mo for U300 vs U100:
    - U300 (0.85 U/kg/day) vs U100 (0.76 U/kg/day)

Insulin Degludec

**desB30 insulin**
- Acylated (16 carbon fatty acid chain) at LysB29

**PK**
- Onset: 2 to 4 h
- Half life: ~25 h
- Duration of action: ≥ 42 h
- Steady state: ~3 to 4 d
- Detectable: ≥ 5 d
- 36-h stable level

**FDA approval in 2015**

Insulin Degludec Mechanism of Action

Insulin degludec

Phenol from the vehicle diffuses quickly

Long multi-hexamer chains assemble

Insulin degludec links up via single side-chain contacts.

Phenol

Zn$^{3+}$
Degludec vs Glargine U100: Insulin-Naive Patients* at 1 Y

- Similar HbA$_{1c}$ and weight changes
  - -1.1% vs -1.2% ($P = .40$)
  - 2.4 kg vs 2.1 kg ($P = .28$)
- Similar overall hypoglycemia†
  - 1.5 vs 1.9 events/y (NS)
- Lower nocturnal hypoglycemia‡,§ with degludec (graph)

*1030 patients with T2D; †Once daily, U100; ‡Hypoglycemia defined as plasma glucose < 56 mg/dL or severe per ADA definition; §Nocturnal, occurring between 0100 h and 0559 h. Zinman B, et al. Diabetes Care. 2012;35:2464-2471.
Degludec vs Glargine U100*: Basal-Bolus With Prandial Insulin Aspart

Equal efficacy, yet less nocturnal (and overall) hypoglycemia with degludec

*992 patients with T2D (full analysis set); †Once daily, U100.
DEVOTE: Study Design and Objectives

Eligibility Criteria:
- T2DM with HbA1c ≥7.0% or <7.0%a
- Age ≥50 years with predefined CV disease or renal disease or age ≥60 with predefined CV risk factors
- ≥1 oral or injectable antihyperglycemic drug

Primary Outcome:
- Composite of CV death, nonfatal MI, or nonfatal stroke

Key Secondary Outcomes:
- Severe hypoglycemic episodes
- Change in HbA1c

Duration: 5 years

- Study design: Multicenter, randomized, double-blind study
- Primary objective: To compare cardiovascular safety of insulin degludec vs. insulin glargine in subjects with type 2 diabetes at high risk of cardiovascular events
- Study start - expected completion: October 2013 - September 2016

aPatients with HbA1c <7.0% receiving ≥20 U of basal insulin/day

This trial was conducted to assess the CV-risk associated with insulin degludec per FDA’s request; earlier results from a meta-analysis of CV events accrued in 17 glycemic trials indicated an increased CV-risk for insulin degludec2

2. http://www.accessdata.fda.gov/drugsatfda_docs/nda/2015/203313Orig1s000_203314Orig1s000SumR.pdf
Similar mean HbA$_{1c}$

- **Observed mean change from baseline at month 24**
  - **Insulin degludec**
    - ETD: $0.01\%$ [−0.05; 0.07]$_{95\% \text{ CI}}$
  - **IGlar U100**

Full analysis set

CI, confidence interval; ET, end treatment visit; ETD, estimated treatment difference
Incidence of severe hypoglycemia

Odds ratio: 0.73
[0.60; 0.89] 95% CI
p<0.001

Full analysis set; The incidence of events is analyzed using a logistic regression model adjusted for treatment group.
Rates of severe hypoglycemia

Rate ratio: 0.60
[0.48; 0.76] 95% CI
p<0.001

<table>
<thead>
<tr>
<th></th>
<th>Insulin degludec (N=3818)</th>
<th>IGlar U100 (N=3819)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAC-confirmed</td>
<td>E</td>
<td>R</td>
</tr>
<tr>
<td>episodes</td>
<td>280</td>
<td>3.70</td>
</tr>
</tbody>
</table>

Full analysis set; Mean number of confirmed severe hypoglycemic episodes. The number of events is analyzed using a negative binomial regression model using a log link and the logarithm of the observation time (100 years) as offset
E, number of events; R, events per 100 patient-years of observation; PYO, patient-years of observation
Rates of nocturnal severe hypoglycemia

Rate ratio: 0.47
[0.31; 0.73] 95% CI
p<0.001

Full analysis set; Nocturnal hypoglycemia: EAC-confirmed severe hypoglycemic episode with an investigator-reported onset between 00:01 and 05:59.

Mean number of nocturnal EAC-confirmed severe hypoglycemic episodes. The number of events is analyzed using a negative binomial regression model using a log link and the logarithm of the observation time (100 years) as offset.
DEVOTE: Conclusions

- In patients with T2DM who were at high CV risk, insulin degludec was noninferior to insulin glargine for the primary CV endpoint\(^a\)
  - HR, 0.91 (95% CI, 0.78-1.06); p=.21
- Insulin degludec was associated with a lower rate of severe hypoglycemia compared to insulin glargine (40% rate reduction; p<.001)
- Rates of AEs were similar between the two groups

\(^a\)Primary endpoint was defined as the composite of CV death, nonfatal MI, or nonfatal stroke

Marso SP et al. *N Engl J Med* 2017;Ahead of print
# Mortality by Severe Hypoglycemia

<table>
<thead>
<tr>
<th></th>
<th>Never Experienced a Hypoglycemic Event</th>
<th>Experienced Hypoglycemic Event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Mortality Rates</strong></td>
<td>1.2% / year</td>
<td>3.3% / year</td>
</tr>
<tr>
<td><strong>Intensive Glycemia</strong></td>
<td>1.3% / year</td>
<td>2.8% / year</td>
</tr>
<tr>
<td><strong>Standard Glycemia</strong></td>
<td>1.1% / year</td>
<td>4.9% / year</td>
</tr>
</tbody>
</table>

New Insulin Pens

Glargine pens
- U300 pen
  - Delivers ≤ 80 U/injection in increments of 1 U

Degludec pens
- U100 pen
  - Delivers ≤ 80 U/injection in increments of 1 U
- U200 pen
  - Delivers ≤ 160 U/injection in increments of 2 U

Pens do not require calculation; simply dial to the number of units prescribed
For titration, recommended time between dose increases is 3 to 4 d
Efficacy and Safety of U-100 Glargine Equivalent (LY2963016) vs U-100 Glargine in Insulin-naive Patients With T2DM

- Equivalent change in A1C (−1.48% vs −1.54%, LY vs GLAR, P = NS)
- Equivalent insulin dose (0.42 vs 0.44 U/kg, LY vs GLAR, P = NS)
- Equivalent weight gain (2.0 vs 2.2 kg, LY vs GLAR, P = NS)

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### Summary

<table>
<thead>
<tr>
<th>U-100 Glargine Equivalent</th>
<th>U-300 Glargine</th>
<th>U-100 and U-200 Degludec</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 units/mL</td>
<td>300 units/mL</td>
<td>100 or 200 units/mL</td>
</tr>
<tr>
<td>Biologically equivalent to U-100 glargine</td>
<td>Same molecule as U-100 glargine but more concentrated</td>
<td>Novel molecular configuration</td>
</tr>
<tr>
<td>Compared with U-100 glargine:</td>
<td>Compared with U-100 glargine:</td>
<td>Compared with U-100 glarginea:</td>
</tr>
<tr>
<td>Equally effective</td>
<td>Equally effective</td>
<td>Equally effective</td>
</tr>
<tr>
<td>Equivalent hypoglycemia</td>
<td>Less hypoglycemiaa</td>
<td>Less hypoglycemiab</td>
</tr>
<tr>
<td>Equivalent weight gain</td>
<td>Equivalent weight gain</td>
<td>Equivalent weight gain</td>
</tr>
</tbody>
</table>

- **U-100 glargine equivalent** has the **same** therapeutic characteristics as U-100 glargine
- **U-300 Glargine**
  - 300 units/mL
  - Same molecule as U-100 glargine but more concentrated
  - Compared with U-100 glargine:
    - Equally effective
    - Less hypoglycemiaa
    - Equivalent weight gain
- **U-100 and U-200 Degludec**
  - 100 or 200 units/mL
  - Novel molecular configuration
  - Compared with U-100 glarginea:
    - Equally effective
    - Less hypoglycemiab
    - Equivalent weight gain

- Ultralong-acting basal insulins have a **flatter time-action profile**, with **less glycemic variability**, and may be **less likely to cause hypoglycemia** than first-generation insulin analogues.

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*a* Significantly less overall hypoglycemia in insulin-naive patients.

*b* Significantly less nocturnal hypoglycemia in insulin-naive patients.
### Guideline Recommendations for Initiating and Titrating Basal Insulin in Patients With T2DM

**ADA/EASD Guidelines**

<table>
<thead>
<tr>
<th><strong>Initial dose</strong></th>
<th><strong>10 U/d or 0.1-0.2 U/kg</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Titration</strong></td>
<td><strong>10%-15% or 2-4 U once or twice weekly to fasting blood glucose (FBG) of 80-130 mg/dL</strong></td>
</tr>
<tr>
<td><strong>Hypoglycemia:</strong></td>
<td><strong>determine and address cause; reduce dose by the greater of 4 U or 10%-20%</strong></td>
</tr>
</tbody>
</table>

Once-daily basal insulin, with injection timing based on patient’s schedule and glucose profile, is a convenient way to initiate insulin.

When Basal Is Not Enough

- **Basal bolus**
  Add prandial insulin before each meal

- **Basal plus**
  Add prandial insulin at main meal

- **Basal plus GLP-1 RAs**

- **Basal**
  Add basal insulin and titrate

- **Lifestyle changes plus metformin**
  (± other agents)
Combination of Basal Insulin With GLP-1 RA Has Scientific Logic

Basal insulin analogs
- Simple to initiate
- Control nocturnal and FPG
- Lower hypoglycemia risk vs NPH
- Modest weight increase (1–3 kg)
- Achieve HbA₁C targets in ~50–60%

GLP-1 RAs
- Simple to initiate
- Pronounced PPG control (short-acting)
- No increase in hypoglycemia
- Weight lowering/neutral effects
- Achieve HbA₁C targets in ~40–60%

Address the pathophysiologic defects that underlie T2DM.

FPG = fasting plasma glucose

## Combination GLP-1 RA/Basal Insulin

<table>
<thead>
<tr>
<th>iGlarlixi</th>
<th>IDegLira</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin glargine + lixisenatide</td>
<td>Insulin degludec + liraglutide</td>
</tr>
<tr>
<td>Once-daily injection 1 hour prior to first meal of the day</td>
<td>Once-daily injection</td>
</tr>
<tr>
<td>Dose range: 15–60U (equivalent to 15U insulin glargine + 5–20 mg lixisenatide)</td>
<td>Dose range: 10–50U insulin degludec + 0.36–1.8 mg liraglutide</td>
</tr>
<tr>
<td>Recommended starting dose:</td>
<td>Recommended starting dose:</td>
</tr>
<tr>
<td>• 15U for patients not controlled on 30U basal insulin or GLP-1 RA</td>
<td>• 16U IDegLira (equivalent to 16 U insulin degludec + 0.58 mg liraglutide)</td>
</tr>
<tr>
<td>• 30U for patients not controlled on 30-60U basal insulin or GLP-1 RA</td>
<td></td>
</tr>
<tr>
<td>Titrate dose up or down by 2–4U/wk to reach glucose target</td>
<td>Titrate dose up or down by 2U every 3–4 days to reach glucose target</td>
</tr>
</tbody>
</table>

**Insulin glargine + lixisenatide (Soliqua™) prescribing information (PI), Rev 2016**
(http://products.sanofi.us/Soliqua100-33/Soliqua100-33.pdf). **Insulin degludec + liraglutide (Xultophy®) PI**
Glucose Control Beyond A1C
Prevention of Hypoglycemia and Glucose variability
Limitations of Current Glucose Monitoring Methods

**A1c**

Standard of care, however:
- The extent to which hypoglycemia and hyperglycemia occur are unknown
- Unknown glucose variability

**SMBG**

Provides glucose information for only points in time, however:
- Hypoglycemia and hyperglycemia are often missed
- Overnight data is impractical
- Logbooks are difficult to interpret

Sources: BBC, US T1 Diabetes Exchange 2011, dQ&A Q42011, ADC Category Revenue Estimates
HbA1c is simple to administer and interpret, but only provides a 90 day average.

HbA1c = 7%

Hyper 58%
Hypo 24%
In-Range 18%

HbA1c = 7%

Hyper 29%
In-Range 63%
Hypo 8%

HbA1c = 7%

In-Range 100%

Note: Patient data for illustrative purposes only

Unknown Daily Glucose Fluctuations

AGP graphs of four different T1 DM patients (each with an A1c of between 7.6 and 7.7%)\(^1\)

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A1C 7.8%

What do you think of this patient’s control?
Rationale for Retrospective CGM

Indications for retrospective CGM\(^1\)
- HbA1c above target with suspected post meal hyperglycemia or under utilization of insulin/oral medication
- Hypoglycemia, hypoglycemic unawareness

Value of retrospective CGM utilization\(^2\)
- Provision of actionable information on patterns and trends, regardless of underlying therapy
# Professional CGM

<table>
<thead>
<tr>
<th>Type of CGM</th>
<th>Professional CGM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primarily owned by</td>
<td>• Clinician</td>
</tr>
<tr>
<td>Purpose</td>
<td>• Facilitate treatment adjustments, patient coaching and education through analysis of patterns and trends of captured data</td>
</tr>
<tr>
<td>Type of data</td>
<td>• Retrospective</td>
</tr>
<tr>
<td>Key insights data can provide</td>
<td>• Snapshot of progress</td>
</tr>
<tr>
<td></td>
<td>• Need for therapy adjustment</td>
</tr>
<tr>
<td></td>
<td>• Glucose patterns</td>
</tr>
</tbody>
</table>
Professional CGM Options

- **G4 Platinum Professional**¹
  - 7-day sensor wear
  - Minimum twice daily finger-stick calibrations
  - Patient wears sensor, transmitter and receiver
  - Equipment disinfection after each use

- **iPro 2**²
  - 6-day sensor wear
  - 3 to 4 daily finger-stick calibrations
  - Patient wears sensor and transmitter
  - Equipment disinfection after each use

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¹ http://hcp.dexcom.com/resources Retrieved November 2016
² http://www.professional.medtronicdiabetes.com/resources-download-library Retrieved January 2017
The AGP graph can predict when a patient is most likely to experience hypoglycemia.\(^1\)

Contributing Factors to Glycemic Variability

- Food choices
- Medications
- Activity
- Other factors
  - Stress
  - Sleep (shift workers)
  - Illness or infections
  - Other medications

How the FreeStyle Libre Pro System works

1. **Application**
   
   HCP applies a sensor onto patient at clinic.

2. **Recording**
   
   Sensor is worn for up to 14 days and records glucose readings continuously.

3. **Download**
   
   Patient returns to the clinic. HCP scans the sensor to download the glucose data.

4. **Interpretation**
   
   Reports generated from the data are interpreted by an HCP and used in patient consultation.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Time</th>
<th>Reimbursable Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Application</td>
<td>HCP applies a sensor onto patient at clinic.</td>
<td>&lt;5 min*</td>
<td></td>
</tr>
<tr>
<td>2. Recording</td>
<td>Sensor is worn for up to 14 days and records glucose readings continuously.</td>
<td>Up to 14 days</td>
<td>CPT 95250</td>
</tr>
<tr>
<td>3. Download</td>
<td>Patient returns to the clinic. HCP scans the sensor to download the glucose data.</td>
<td>&lt;5 min*</td>
<td>CPT 95251</td>
</tr>
<tr>
<td>4. Interpretation</td>
<td>Reports generated from the data are interpreted by an HCP and used in patient consultation.</td>
<td>~10 min*</td>
<td></td>
</tr>
</tbody>
</table>
Stick on, scan in, read out
Easy to integrate into practice

• **1-STICK ON**
  • Sensor is applied to the back of the upper arm and activated during an office visit.

• **2- 14 DAYS**
  • Patient wears the sensor up to 14 days without any interaction with the device.

• **3-SCAN IN**
  • Sensor is scanned at the next visit.
Ambulatory Glucose Profile (AGP) is a visual report that is designed to collapse all glucose readings from several days or weeks as if they occurred in a single 24-hour period, making it easier to visualize glycemic patterns:

- The shape of the median curve represents variability: flat curve = stability; sharp rise and drop = instability
- The dark blue band represents 50% of all data, or the Interquartile range (IQR): the wider the IQR the more variability
- The light blue band represents the 10th to 90th percentile: 80% of all data
Christopher M. is a 30 year old male, diagnosed Type 1 DM 10 years ago. Christopher was on an insulin pump for three years, not well controlled, decided to go on MDI.

On Tresiba 10 units and Humalog with meals I/C: 1/10, CF: 1/60. His HbA1c 7-7.7% and his BMI was 18.6. SMBG < 70 mg/dl before meals.
Real Patient Case Study 1 – Christopher M. (before)
The case study provided is intended to be used for educational purposes only. Individual symptoms, situations and circumstances may vary.
Darryl H. is a 53 year old male, diagnosed Type 2 DM 9 years ago. When Darryl was seen in February, he had an HbA1c greater than 15%. His BMI was 24.5. Darryl started on Tresiba at 50 units and Trulicity at 1.5 mg/week plus Metformin. 3 months later his HbA1c is 8.8%
The case study provided is intended to be used for educational purposes only. Individual symptoms, situations and circumstances may vary.

Real Patient Case Study 2 – Darryl H.
Manuel I. is a 64 year old male, diagnosed Type 2 DM in February, was referred for evaluation RX. Metformin 1000 mg BID. His HbA1c was 9.6%!
Started on GLP-1 RA, did not tolerate well, treatment was changed to Tresiba 20 units/day.
On his recent visit A1c was 6%, he denied any symptoms of hypoglycemia. To R/o Asymptomatic hypoglycemia.
Real Patient Case Study 4 – Manuel I.

Daily Patterns (with Ambulatory Glucose Profile)
19 July 2017 - 2 August 2017 (15 days)

Estimated A1c 5.6%, or 38 mmol/mol

<table>
<thead>
<tr>
<th>Glucose (mg/dL)</th>
<th>00:00</th>
<th>02:00</th>
<th>04:00</th>
<th>06:00</th>
<th>08:00</th>
<th>10:00</th>
<th>12:00</th>
<th>14:00</th>
<th>16:00</th>
<th>18:00</th>
<th>20:00</th>
<th>22:00</th>
<th>00:00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125</td>
<td>104</td>
<td>96</td>
<td>100</td>
<td>124</td>
<td>123</td>
<td>114</td>
<td>115</td>
<td>111</td>
<td>119</td>
<td>117</td>
<td>121</td>
<td></td>
</tr>
</tbody>
</table>

Target Range

The case study provided is intended to be used for educational purposes only. Individual symptoms, situations and circumstances may vary.
Summary

- Most patients with T2DM will eventually need insulin therapy
- Insulin is recommended throughout the progression of T2DM
- Earlier insulin use is associated with better long-term glycemic control than postponed insulin use
- With appropriate dose adjustment, insulin can be used alone or in combination with other antihyperglycemic agents in essentially all patients
- New Technologies allow us to go beyond A1C, detect hypoglycemia, minimize glucose variability and adjust our therapy based on REAL DATA!