Learning Objectives

- Summarize the clinical evidence supporting the use of basal insulin therapy, with and without GLP-1 receptor agonists, in the management of type 2 diabetes.
- Incorporate strategies to overcome barriers to insulin use in the treatment of type 2 diabetes.

Incorporating the New AACE Comprehensive Diabetes Management Algorithm

Frank Lavernia, MD
Founder
North Broward Diabetes Center
Deerfield Beach, FL

Presenter Disclosure Information

The following relationships exist related to this presentation:

- Frank Lavernia, MD, participates on the advisory board for Janssen Pharmaceuticals, Sanofi-Aventis, Eli Lilly, and Eisai.
- George Dailey III, MD, participates on the speakers bureau for Merck, Sanofi-Aventis, BMS-Astra Zeneca, Eli Lilly-Boeringer Ingleheim, Amylin, and Janssen; as an investigator for Sanofi-aventis, GlaxoSmithKline, Merck, Eli Lilly-Boergering Ingleheim, Amylin, Novo Nordisk, Roche, Novartis, Halozyme, GSK, Lexicon, Bristol-Myers Squibb/Astra Zeneca, Gilead, Lexicon, ITC, Minimed, and Mannkind; and as an occasional consultant for Sanofi-Aventis.
- Carol Wysham, MD, participates on the speakers bureau for Bristol-Myers Squibb/Astra Zeneca, Boehringer Ingleheim, Eli Lilly, Janssen, Novo Nordisk, Sanofi-Aventis; and receives consulting fees from Bristol-Myers Squibb/Astra Zeneca, Boehringer Ingleheim, Eli Lilly, Janssen, and Sanofi-Aventis.
**Goals and Objectives**

1. Utilize a case based, practical approach to allow you to effectively employ basal insulin in your patients with T2DM
2. Interactive cases will illustrate:
   a) How to use the latest guidelines
   b) When and how to use basal insulin with and without GLP-1 receptor agonists and in combination with other anti-diabetic agents
   c) What you need to know about safety issues

**Case 1: Mary**

- 52-year-old Latina woman obese with T2DM for 14 years
- She is presently taking metformin 1000 mg BID, glimepiride 4 mg BID, sitagliptin 100 mg daily
- She comes to the office complaining of increased tiredness and elevated fasting blood sugars in the 180 to 200 mg/dL range
- Her A1C now is 9.8% (eAG 231 mg/dL)

**Decline in β-Cell Function with Diabetes Progression: UKPDS**

![Graph showing decline in β-cell function with diabetes progression.]

- Dashed line shows extrapolation forward and backward from years 0 to 6 based on HOMA data from UKPDS.

**How to Start Insulin Therapy When Oral Antidiabetic Drugs Fail in Patients with T2DM**

- **Basal Insulin Therapy**
- **Combination of 2 or 3 OADs**
- Lifestyle changes plus metformin

**Idealized Profiles of Basal Insulin Analogs**

![Graph showing idealized profiles of basal insulin analogs.]

**So, When Do You Add Insulin?**

- ADA/EASD and AACE consensus statements agree:
  - Lifestyle modification + 2 to 3 oral/non-insulin injectable (in 3-month increments/changes) and fail to achieve goal A1C level
  - Start basal insulin to achieve glucose targets

**Rx: Insulin, Metformin, Sulfonylurea**

**β-Cell Function (%)**

**Postprandial Hyperglycemia**

**IGT Type 2 Diabetes**

**Phase I Type 2 Diabetes**

**Phase II**

**Phase III**

**So, When Do You Add Insulin?**

- ADA/EASD and AACE consensus statements agree:
  - Lifestyle modification + 2 to 3 oral/non-insulin injectable (in 3-month increments/changes) and fail to achieve goal A1C level
  - Start basal insulin to achieve glucose targets

Are There Any Other Reasons to Start Insulin Sooner?

- Individuals presenting with very high glucose levels (>300 mg/dL) — Glucotoxicity
- A1C >10%
- Symptomatic patients with ketonuria and in a catabolic state

Reasons for Clinical Inertia

- Lack of education, training, and practice organization to achieve goals
  - Need for combination therapy
  - Familiarity with algorithms
  - Use of preventive medicine checklists

How to Adjust Insulin

- Identify target blood glucose goals
- Emphasize importance of eating consistently when trying to determine insulin adjustment and pattern management, especially carbohydrates
- Determine basal insulin doses by looking for blood glucose patterns

Reasons for Clinical Inertia

- Overestimation of care
- “Soft” reasons for lack of intensification
  - Perception of improving control
  - Dietary non-adherence
  - Translatability of clinical research findings
  - Drug side effects and interaction
  - Patient aversion to medical therapy

Case 1: Mary

- Following a discussion of the advantages and precautions about using insulin therapy, you begin Mary on a long-acting basal insulin analog, continuing metformin 1000 mg BID, glimepiride 4 mg BID, sitagliptin 100 mg daily
- She is advised to self monitor her fasting
- After 4 weeks her A1C now is 8.0% (eAG 231 mg/dL)

Initiating and Titrating Basal Insulin Detemir

INITIATION: 10 units or 0.1 to 0.2 units/kg daily

TITRATION: Assess mean 3-day fasting plasma glucose and adjust every 3 days according to the following schedule:

- If fasting plasma glucose goal is 70 to 90 mg/dL:
  1) Add 3 units if FPG is >90 mg/dL
  2) No Change if FPG is 70 to 90 mg/dL
  3) Reduce dose by 3 units if FPG is <70 mg/dL

- If fasting plasma glucose goal is 80 to 110 mg/dL:
  1) Add 3 units if FPG is >110 mg/dL
  2) No Change if FPG is 80 to 110 mg/dL
  3) Reduce dose by 3 units if FPG is <80 mg/dL
Initiating and Titrating Basal Insulin Glargine

INITIATION: 10 units daily

TWO SUGGESTED TITRATION OPTIONS:
1) Increase dose by 2 units every 3 days until individualized target fasting plasma glucose is achieved

OR

2) Increase by 1 unit every day until fasting plasma glucose ≤100 mg/dL or individualized target fasting plasma glucose is achieved

Take Home Points

• AACE algorithms recommend use of insulin if not at goal within the first year of treatment
• Basal insulin is titrated to a target FPG
• Insulin can be used in combination with other agents
• Stop titration of basal insulin when fasting plasma glucose goals are achieved or with warning signs of hypoglycemia

Addressing Post-Prandial Hyperglycemia in Patients Taking Basal Insulin

George Dailey III, MD
Medical Director/Head of Diabetes Research, Scripps Whittier Diabetes Institute
Clinical Professor of Medicine, University of California, San Diego
San Diego, CA

Case 2: Eloise

• 60-year-old African-American female with hypertension and T2DM for 11 years
• Current medications: metformin 1000 mg BID, glipizide XL 10 mg once daily, insulin detemir 25 units daily and olmesartan/HCTZ 20/12.5 once daily
• She tells you: “Doctor, I am always hungry, and my sugar is frequently in the 200 to 225 range after supper.”
• Lab data:
  – BMI 30 kg/m²; BP 146/94 mmHg bilaterally
  – A1C 8.2%; Post supper glucose 201 to 243 mg/dL; Pre-breakfast glucose 108 to 125 mg/dL
  – Triglycerides: 249 mg/dL; HDL-C 42 mg/dL; LDL-C 113 mg/dL; Total cholesterol 205 mg/dL
  – eGFR 85 mL/min

When Basal Insulin, Metformin, and Secretagogues are Not Enough: What is the Next Strategy?

Individualize treatment to patient’s needs:
– Add or substitute premix insulin
– Add bolus insulin analogue
– Add GLP-1 receptor agonist
– Add SGLT2 inhibitor

Optimizing Insulin Therapy for Maintenance of Glycemic Control When Basal is Not Enough

• Add prandial insulin before meals
• Add prandial insulin at main meal
• Add basal insulin and titrate
• Lifestyle changes plus metformin (+/- other agents)
Insulin in Combination With Other Agents

- Insulin + GLP-1 receptor agonists
- Insulin + DPP-4 inhibitors
- Insulin + SGLT2 inhibitors

SGLT2 Inhibitors

- Oral agents: canagliflozin, dapagliflozin
- Efficacy:
  - Moderate A1C improvement (average A1C reductions 0.6% to 0.9%)
  - Reduce systolic and diastolic blood pressure
  - Weight loss (2 to 4 kg)
- Safety:
  - No added hypoglycemia unless used with secretagogues and/or insulin
  - Increases LDL-C and non-HDL-C (canagliflozin)
- Dapagliflozin not indicated for eGFR < 60 mL/min/1.73m²
- Canagliflozin not indicated for eGFR < 45 mL/min/1.73m²

DPP-4 Inhibitors

- Efficacy:
  - Moderate A1C improvement
  - Higher potency when combined with metformin
  - Weight neutral
  - Improved CV risk profile
- Safety:
  - No added hypoglycemia unless used with sulfonylurea
  - No GI side effects
- Dosing adjustments for renal dysfunction EXCEPT lixagliptin

Symptomatic Hypoglycemic Events

Idealized Profiles of Human Insulin and Analogs
**Ideal Insulin Replacement Pattern**

Basal
Mealtime

**Patients With Type 2 Diabetes May Spend 12 Hours Per Day in the Postprandial State**

Postprandial
Postabsorptive
Fasting

**Matching Treatment to Disease Progression Using a Stepwise Approach**

Basal Bolus: Once-daily basal insulin plus rapid-acting insulin before meals

Basal Bolus
Add prandial insulin before each meal

Basal Plus
Add prandial insulin at main meal

Basal
Add basal insulin and titrate

Lifestyle changes plus metformin
(± other agents)

Progressive deterioration of β-cell function

**Relative Contributions of Postprandial and Fasting Hyperglycemia Related to A1C**

PPG Becomes More Important to Control in Type 2 Diabetes as A1C Level Improves

**Insulin Analogs**

- Rapid-acting (mealtime)
  - Insulin aspart
  - Insulin glulisine
  - Insulin lispro
- Long-acting (basal)
  - Insulin detemir
  - Insulin glargine

**Insulin Analogs (cont’d)**

Pre-mixed analogs
- Insulin aspart protamine and insulin aspart
- Insulin lispro protamine and insulin lispro
Pre-Mixed Regimen
Prandial Insulin Profile

Provides combined prandial and basal coverage with two injections

Plasma Insulin µU/ml

<table>
<thead>
<tr>
<th>Time</th>
<th>4:00</th>
<th>8:00</th>
<th>12:00</th>
<th>16:00</th>
<th>20:00</th>
<th>24:00</th>
<th>4:00</th>
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<tbody>
<tr>
<td>Breakfast</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
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<tr>
<td>Dinner</td>
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</tbody>
</table>

Sequential Insulin Strategies in Patients with T2DM

Non-insulin regimen
Basal insulin only (usually with oral agents)
Basal insulin + 1 (mealtime) rapid-acting insulin injection
Premixed insulin twice daily
Basal insulin + ≥ 2 (mealtime) rapid-acting insulin injection

Number of Complexity
1 Low
2 Mod
3+ High

More Flexible Less Flexible

Pre-Mixed Regimen
Prandial Insulin Profile

Provides combined prandial and basal coverage with two injections

Plasma Insulin µU/ml

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<th>4:00</th>
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<tr>
<td>Breakfast</td>
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<tr>
<td>Lunch</td>
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<tr>
<td>Dinner</td>
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</tr>
</tbody>
</table>

1.2.3 Study: Glargine Plus 1, 2, or 3 Doses of Glulisine

Evolution of A1C in the randomized population (n=343)

Glarine alone
Glarine plus glulisine (patients with A1C >7%)

HbA1c (%)

<table>
<thead>
<tr>
<th>Time</th>
<th>Rest in Run in Randomization</th>
<th>Wk 3</th>
<th>Wk 12</th>
<th>Wk 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td>7.0</td>
<td>7.0</td>
<td>7.0</td>
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<tr>
<td>7.5</td>
<td>7.5</td>
<td>7.5</td>
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<td>8.0</td>
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<td>9.0</td>
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</tr>
</tbody>
</table>

How to Initiate Basal-Plus 1 Regimen

- Start with one dose at largest/main meal - generally dinner
- Continue metformin + stop insulin secretagogues
- Encourage patient to keep journal to track BG patterns
  - "Testing in pairs" – bedtime and AM
- Start with 4 units or 10% of basal dose
- Consider decreasing basal dose by same amount
- Instruct patient to increase by 1 to 2 units every 1 to 3 days until HS BG is in goal (120 to 150 mg/dL)


Adjusting Pre-meal Insulin

<table>
<thead>
<tr>
<th>When to inject</th>
<th>When to test</th>
<th>If BG is:</th>
<th>You should</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>At dinner</td>
<td>Before bed</td>
<td>&lt; 125</td>
<td>Subtract 2 units</td>
<td>Before dinner next day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>125 – 150</td>
<td>No change</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 150</td>
<td>Increase by 2 units</td>
<td></td>
</tr>
</tbody>
</table>

Use of Twice-Daily Exenatide in Basal Insulin–Treated Patients with T2DM

Change in A1C Over 30 Weeks

Change in HbA1c (%)

<table>
<thead>
<tr>
<th>Week</th>
<th>0.5</th>
<th>-1.0</th>
<th>-1.5</th>
<th>-2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>20</td>
<td></td>
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</tr>
<tr>
<td>30</td>
<td></td>
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</tr>
</tbody>
</table>

Change in A1C over 30 weeks. Data are least-squares means estimated from a mixed model, in which the post-baseline treatment effect was modeled as a linear function of visit on repeated measures. *P < .001 for between-group comparisons.

Using Basal Insulin with GLP-1 Receptor Agonists

<table>
<thead>
<tr>
<th>Complementary features of basal insulin and GLP-1 receptor agonists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basal Insulin</strong></td>
</tr>
<tr>
<td>Primary effects</td>
</tr>
<tr>
<td>‣ Fasting glucose</td>
</tr>
<tr>
<td>‣ Interprandial glucose</td>
</tr>
<tr>
<td>Mechanisms</td>
</tr>
<tr>
<td>‣ Hepatic glucose production</td>
</tr>
<tr>
<td>‣ Non-glucose dependent endogenous insulin</td>
</tr>
<tr>
<td>+ Glucagon secretion</td>
</tr>
<tr>
<td>+ Insulin concentration</td>
</tr>
<tr>
<td>Effect on weight</td>
</tr>
<tr>
<td>‣ Body weight</td>
</tr>
</tbody>
</table>


**Case 2: Eloise**

- Eloise would initially like to try a GLP-1 receptor agonist added to her basal insulin
- She does not have any contraindications, is already using a basal insulin pen, and likes the idea of possibly losing weight in addition to having something to curb her appetite.

**Therapeutic Rationale**

Advantages of GLP-1 receptor agonist compared to other possible therapies in this patient:
1. Weight reduction (weight gain with insulin; weight neutral with DPP-4 inhibitor)
2. Reduced postprandial lipemia and hypertriglyceridemia (increased LDL-C and non-HDL-C with SGLT2 inhibitors)
3. Low risk of hypoglycemia (increased risk with secretagogues and insulin)
4. Blood pressure reduction (SGLT2 inhibitors also lower blood pressure – no direct effects with other agents)
5. Increased satiety (not seen with other agents) – the patient needs help curbing her appetite


**Using Insulin and GLP-1 Receptor Agonists**

- Intensive insulin regimens are associated with a higher risk of hypoglycemia and weight gain
- Basal insulin in combination with GLP-1 receptor agonists improve A1C and postprandial glucose with weight loss and no marked increase in the risk of hypoglycemia


**Which to Use First—Insulin or GLP-1 Receptor Agonist?**

Starting with GLP-1 receptor agonist and then adding insulin (if necessary):
1) May allow potential nausea associated with GLP-1 receptor agonist to diminish before starting insulin
2) Avoids challenges of down-titrating insulin
3) May avoid or delay insulin use

Adding GLP-1 receptor agonist to basal insulin:
1) Attenuates weight gain
2) Improves postprandial glycemic control and lowers A1C


**Take Home Points**

- Patients can successfully self-titrate basal insulin
- Basal insulin analogues provide a relatively peakless, more physiological time-action profile than NPH insulin
- GLP-1 receptor agonists plus long-acting basal insulin provide an attractive combination to control fasting and postprandial glucose, while attenuating weight gain and suppressing appetite
- An individualized approach is always best, balancing convenience of basal-only or premix regimens with the control achievable by more complex regimens including combinations with other agents
Insulin Therapy: Addressing Safety and Patient Concerns

Carol Wysham, MD
Clinical Associate Professor of Medicine
University of Washington School of Medicine
Research Professor at the College of Pharmacotherapy
Washington State University
Section Head, Rockwood Center for Diabetes and Endocrinology
Spokane, WA

Objectives

• Review the evidence regarding diabetes therapies and their effects on weight gain and hypoglycemia
• Advance your skills in counseling patients on insulin injections, devices, and techniques
• Improve your approaches for individualizing diabetes therapy to improve adherence

Case 3: Alice

• 58-year-old African-American female with 7 year history of T2DM on metformin 1000 mg BID and glimepiride 4 mg QAM.
• She works as a salesperson in a department store. She struggles with her weight. Finances are tight.
• At her previous visit, 6 months ago, her A1C was 7.6%. You suggested insulin, but she begged you to try diet and exercise. You reluctantly agree.

Case 3: Alice

Follow-up Visit

• She returns for follow up. She admits that she has not been able to make significant changes in her diet and exercise.
• Her weight is unchanged at 198 lbs.
• Her A1C is 7.9%.
• Again you suggest basal insulin as an option. She starts to cry.

Patient Barriers to Insulin Therapy

• Fear of injection
• Fear of hypoglycemia
• Weight gain
• Feelings of failure
• Association of insulin with poor prognosis
• Stigma
• Concerns about fitting it into their lifestyle
• Cost
• More frequent monitoring

Patient Willingness to Start Insulin Therapy

What you say (and how you say it) makes a difference!

Patient Willingness to
Start Insulin Therapy

Unwilling to
Start Insulin
Ambivalent
Willing to
Take Insulin

Provider Barriers To Insulin Therapy

- Initiating insulin takes time
- Management more complicated
- Lack of resources
- Increased risk for hypoglycemia
- Fear of increased CVD risk
  - ORIGIN study refutes this
- Weight gain, worsening insulin resistance
- Patient resistance

Addressing Patient Barriers to Insulin

- Explain progressive nature of disease and need for progressive changes in treatment at initial and follow up visits
- Discuss likely need for insulin from the outset
  - If patient elicits a negative response, explore it and try to dispel concerns
- Never use insulin as a threat
- Take care with your words/actions

“Weight” Has Negative Impact Beyond Therapeutic Goals in Those With T2DM

- Worry about weight has been associated with poorer outcomes, such as greater likelihood of
  - Symptomatic hyperglycemia
  - Suboptimal therapy adherence
  - Poor psychological well-being
  - Diabetes-specific stress

- Weight gain has been associated with
  - Lower treatment satisfaction
  - Lower health-related quality of life

Weight Changes with Antihyperglycemic Agents Added to Metformin: Meta-Analysis

Weight Gain Minimized by Metformin

Change in Weight in Treat-to-Target Studies Using Basal Insulin
Classification of Hypoglycemia

<table>
<thead>
<tr>
<th>Classification</th>
<th>Severe hypoglycemia</th>
<th>Documented symptomatic hypoglycemia</th>
<th>Asymptomatic hypoglycemia</th>
<th>Probable symptomatic hypoglycemia</th>
<th>Pseudo-hypoglycemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical symptoms of hypoglycemia with measured plasma glucose ≤ 70 mg/dL</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No typical symptoms of hypoglycemia but measured plasma glucose ≤ 70 mg/dL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical symptoms of hypoglycemia but no measured plasma glucose available</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Typical symptoms of hypoglycemia with measured plasma glucose &gt; 70 mg/dL</td>
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</tbody>
</table>

Note: Pseudohypoglycemia was previously defined by Cryer et al. (2009) as an artifact after a blood sample was drawn. Pseudohypoglycemia as defined here was previously called relative hypoglycemia.


Severe hypoglycemia
- Assistance required from another person

Documented symptomatic hypoglycemia
- Typical symptoms of hypoglycemia with measured plasma glucose ≤ 70 mg/dL

Asymptomatic hypoglycemia
- No typical symptoms of hypoglycemia but measured plasma glucose ≤ 70 mg/dL

Probable symptomatic hypoglycemia
- Typical symptoms of hypoglycemia but no measured plasma glucose available

Pseudo-hypoglycemia
- Typical symptoms of hypoglycemia with measured plasma glucose > 70 mg/dL

Hypoglycemia in Insulin Treated Patients with T2DM

<table>
<thead>
<tr>
<th>Mild hypoglycemia (events per week)</th>
<th>0.4 to 0.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoglycemia unawareness (%)</td>
<td>49 to 64</td>
</tr>
<tr>
<td>Patient rarely or never reports hypoglycemia to providers (%)</td>
<td>50 to 59</td>
</tr>
<tr>
<td>Provider does not ask about hypoglycemia during routine appointment (%)</td>
<td>26</td>
</tr>
</tbody>
</table>


Hypoglycemia: Antihyperglycemic Agents Added to Metformin

<table>
<thead>
<tr>
<th>Drug</th>
<th>Odds Ratio vs Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biphasic insulin</td>
<td>17.8</td>
</tr>
<tr>
<td>Glinide</td>
<td>10.5</td>
</tr>
<tr>
<td>SU</td>
<td>8.9</td>
</tr>
<tr>
<td>Basal insulin</td>
<td>4.8</td>
</tr>
<tr>
<td>DPP-4i</td>
<td>1.1</td>
</tr>
<tr>
<td>GLP-1 RA</td>
<td>0.9</td>
</tr>
<tr>
<td>T2D</td>
<td>0.5</td>
</tr>
<tr>
<td>AGI</td>
<td>0.4</td>
</tr>
</tbody>
</table>


Appropriate Titration Is Critical to the Success of Insulin Therapy

- ADA/EASD consensus algorithm for the initiation and adjustment of a basal insulin regimen is indicated as follows:

  - Start with a long-acting basal insulin
  - Initiated at 10 units/day or 0.2 units/kg/day
  - Check fasting glucose daily and increase dose by:
    - 2 units every 3 days until fasting levels are in target range (70 to 130 mg/dL)


Case 3: Alice Starting Insulin

- She agrees to try basal insulin
- Due to finances, you start her on NPH insulin 10 units at bedtime
- You ask your medical assistant to show her how to inject, using a pen, and to review self-titration. She gives herself a small dose in the office
- You ask her to return in 4 weeks

Simplest Titration Option
(The Goal Should be Individualized)

Increase by 1, REPEAT unit every day; continue until FPG ≤ Target 130 mg/dL* (or higher, as appropriate)

NOTE: Dosage should not be increased that week if there are any episodes of documented hypoglycemia (<72 mg/dL) during the preceding week.

In the Treat to Target Study – Median Insulin dose = 0.48 U/kg

*Adjust dose subsequently to patient’s need.
Case 3: Alice
Follow-up Visit

- She did well for two years, but changed to insulin detemir due to occasional nocturnal hypoglycemia.
- Current dose is 50 units at bedtime.
- Weight: 201 pounds
- A1C: 7.9%
- As requested, she brings in SMBG records.

**Case 3: Alice SMBG RESULTS**

<table>
<thead>
<tr>
<th></th>
<th>B' FAST</th>
<th>LUNCH</th>
<th>DINNER</th>
<th>HS</th>
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</thead>
<tbody>
<tr>
<td>MON</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TUES</td>
<td>118</td>
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<tr>
<td>WED</td>
<td>136</td>
<td></td>
<td></td>
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<tr>
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</table>

**WHAT NEXT?**

### Objectives

- Review the evidence regarding diabetes therapies and their effects on weight gain and hypoglycemia
- Advance your skills in counseling patients on insulin injections, devices, and techniques
- Improve your approaches for individualizing diabetes therapy to improve adherence

### Insulin Syringes

- Insulin syringes come in 3 volumes:
  - 1 cc (100 units)
  - ½ cc (50 units)
  - 0.3 cc (30 units)

### Steps to Injecting Insulin with a Pen

- Put a needle on the pen
- Dial up and discard 2 units to “prime” the pen
- Dial up dose
- Inject (no pinch needed) in abdomen, arm or leg
- Count five seconds before withdrawing

### Pen Needles – Not All The Same!

- Equivalent glycemic control REGARDLESS of BMI
- Strong preference for shorter needles
- Ease of use, pain, overall preference

Objectives

- Review the evidence regarding diabetes therapies and their effects on weight gain and hypoglycemia
- Advance your skills in counseling patients on insulin injections, devices, and techniques
- Improve your approaches for individualizing diabetes therapy to improve adherence

Goals to Facilitating Behavior Change

**Goal-Setting Model**
- Explore the problem
- Clarify feelings and meaning
- Develop a plan
- Commit to action
- Experiment with and evaluate the plan

**Communication Model**
- Ask
- Listen
- Empathize
- Encourage

Ask open-ended questions to help patient:
1. Reflect on areas of concern or behaviors
2. Identify actions to address the problem or behavior

Patient-Centered Communication
Focus on the person, not the disease
Explore feelings — many patients with diabetes feel shock, guilt, anger, anxiety, depression, and helplessness

**Communication Model**
- Ask
- Listen
- Empathize
- Encourage

Ask open-ended questions to help patient:
1. Reflect on areas of concern or behaviors
2. Identify actions to address the problem or behavior

**Goal-Setting Model**
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Strategies to Address Patients Concerns About Insulin Therapy

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Strategies to Address Concerns</th>
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<tbody>
<tr>
<td>Sense of control</td>
<td>Insulin treatment helps control glucose</td>
</tr>
<tr>
<td>Belief that means diabetes more serious</td>
<td>Explain progressive insulin deficiency</td>
</tr>
<tr>
<td>Sense of personal failure</td>
<td>Show that insulin can be used at any point</td>
</tr>
<tr>
<td>Injection-related anxiety</td>
<td>Show patient a needle</td>
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<tr>
<td>Fear of weight gain</td>
<td>Starting insulin early – less weight gain</td>
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<tr>
<td>Fear of hypoglycemia</td>
<td>Discern between minor and serious</td>
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</tbody>
</table>

Modified from Peyrot M. Prim Care. 2010 4(suppl 1) S11 – S18.

Take Home Points

- Treatment goals and insulin regimens must be individualized. Use shared decision making.
- Basal insulin is usual first option
- Basal + 1 or premixed are reasonable next step
  - Consider when: A1C >7% and FBG < 130 mg/dL
  - Basal insulin dose >0.5 units/kg
  - HS BG >> FBG
- Consider addition of GLP-1 receptor agonist, especially short-acting ones
- Remember you can always negotiate a 1 month trial

Question & Answer