Barriers to Insulin:
Overcoming FEAR
Promoting LOVE

Christian Hermansen, MD
Medical Director, Downtown Family Medicine
Assistant Deputy Director, Lancaster General Family Medicine Residency
Disclaimer

• I am not a diabetic expert
• Preparation breeds conviction
• Springboard for discussion rather than mandate
Let’s Talk About

• When should we start insulin
• How should we start insulin
• Review patient and provider barriers to insulin
• Review strategies to overcome these issues
• Discuss our experience in the trenches
We currently identify patients as high risk for diabetes and initiate discussion with each patient.

1. Strongly Agree
2. Agree
3. Unsure
4. Disagree
5. Strongly Disagree
I can name at least 3 barriers that patients have expressed for not adhering to their insulin regime.

1. Strongly Agree
2. Agree
3. Unsure
4. Disagree
5. Strongly Disagree
Average Daily Food Intake of Homer Simpson

Snacks:
- 1 Family-Size Chippos
- 1 Can Nuts and Gum
- 1 Powersauce Bar
- 1 Hot Dog
- 64 Slices of Cheese
- 11,239 estimated cals.

Throughout Day:
- 12 Duff Beers
- 1,740 estimated cals.

Lunch:
- 2 Krusty Burgers
- 3 Orders of Fries
- 2 Large Squishes
- 2,360 estimated cals.

Dinner:
- 1/2 whole pig
- 1 bowl mashed potatoes
- 1 bowl green moosh
- 2 pieces floor pie
- 5,340 estimated cals.

Breakfast:
- 13 Donuts
- 4,250 estimated cals.

Suggested Daily Cals: 2,774
HOMER’S ESTIMATED CALS: 24,929
What Do We Know to Start?

• By the time T2DM is diagnosed, up to 50% of beta cells are not functioning properly

• Beta cell failure continues in DM at about 4% annually
In General

Insulin should be started when insulin secretory capacity of pancreatic beta cells is insufficient to achieve glycemic control
What is the A1c Goal? ADA

• Lowering A1C to below or around 7% has been shown to reduce microvascular complications of diabetes, and if implemented soon after the diagnosis of diabetes is associated with long-term reduction in macrovascular disease. Therefore, a reasonable A1C goal for many nonpregnant adults is <7%. (B)

• Providers might reasonably suggest more stringent A1C goals (such as <6.5%) for selected individual patients, if this can be achieved without significant hypoglycemia or other adverse effects of treatment. Appropriate patients might include those with short duration of diabetes, long life expectancy, and no significant CVD. (C)
But What About My Really Sick Patients? - ADA

- Less stringent A1C goals (such as <8%) may be appropriate for patients with a history of severe hypoglycemia, limited life expectancy, advanced microvascular or macrovascular complications, and extensive comorbid conditions and for those with longstanding diabetes in whom the general goal is difficult to attain despite diabetes self-management education, appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents including insulin. (B)
How Many DM Patients at Goal?

- US Data 2000-2004: 43% goal not achieved
- UK Data 2007-2008: 33% goal not achieved
- DFM Data 2012: 35% DM have A1c > 9
- PAFP RPC Data
Defining Our Terms

• Initiation
  – Starting someone on insulin

• Intensification
  – Increasing the dose of their insulin
  – Increasing the number of shots they receive
Burning Question

AT WHAT POINT SHOULD INSULIN BE CONSIDERED?
Criteria for Insulin Institution

• Definition of Severe Hyperglycemia (Diabetes Care 2009):
  1. Fasting glucose > 250
  2. Random glucose > 200
  3. A1c > 10
  4. Ketonuria
  5. Symptomatic diabetes
Effects of Intensive Glucose Lowering in Type 2 Diabetes

The Action to Control Cardiovascular Risk in Diabetes Study Group

ACCORD TRIAL

ABSTRACT

BACKGROUND

Epidemiologic studies have shown a relationship between glycated hemoglobin levels and cardiovascular events in patients with type 2 diabetes. We investigated whether intensive therapy to target normal glycated hemoglobin levels would reduce cardiovascular events in patients with type 2 diabetes who had either established cardiovascular disease or additional cardiovascular risk factors.

METHODS

In this randomized study, 10,251 patients (mean age, 62.2 years) with a median glycated hemoglobin level of 8.1% were assigned to receive intensive therapy (targeting a glycated hemoglobin level below 6.0%) or standard therapy (targeting a level from 7.0 to 7.9%). Of these patients, 58% were women, and 35% had had a previous cardiovascular event. The primary outcome was a composite of nonfatal myocardial infarction, nonfatal stroke, or death from cardiovascular causes. The finding of higher mortality in the intensive-therapy group led to a discontinuation of intensive therapy after a mean of 3.5 years of follow-up.

RESULTS

At 1 year, stable median glycated hemoglobin levels of 6.4% and 7.5% were achieved in the intensive-therapy group and the standard-therapy group, respectively. During follow-up, the primary outcome occurred in 352 patients in the intensive-therapy group, as compared with 371 in the standard-therapy group (hazard ratio, 0.90; 95% confidence interval [CI], 0.78 to 1.04; P = 0.16). At the same time, 257 patients in the intensive-therapy group died, as compared with 203 patients in the standard-therapy group (hazard ratio, 1.22; 95% CI, 1.01 to 1.46; P = 0.04). Hypoglycemia requiring assistance and weight gain of more than 10 kg were more frequent in the intensive-therapy group (P < 0.001).

CONCLUSIONS

As compared with standard therapy, the use of intensive therapy to target normal glycated hemoglobin levels for 3.5 years increased mortality and did not significantly reduce major cardiovascular events. These findings identify a previously unrecognized harm of intensive glucose lowering in high-risk patients with type 2 diabetes. (ClinicalTrials.gov number, NCT00000620.)
### Degree of A1c Reduction Per Medicine

<table>
<thead>
<tr>
<th>Medication</th>
<th>A1c Reduction Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metformin</td>
<td>1-1.5%</td>
</tr>
<tr>
<td>Sulfonylureas</td>
<td>1-1.5%</td>
</tr>
<tr>
<td>TZD</td>
<td>1-1.5%</td>
</tr>
<tr>
<td>DPP-4 Inhibitors</td>
<td>0.5-1%</td>
</tr>
<tr>
<td>GLP-1 Agonists</td>
<td>1-1.5%</td>
</tr>
<tr>
<td>Insulin</td>
<td>1.5-3.5%</td>
</tr>
</tbody>
</table>
**Table 1**

**Summary of Key Benefits and Risks of Medications**

Benefits are classified according to major effects on fasting glucose, postprandial glucose, and nonalcoholic fatty liver disease (NAFLD). Eight broad categories of risks are summarized. The intensity of the background shading of the cells reflects relative importance of the benefit or risk.*

<table>
<thead>
<tr>
<th>Medications*</th>
<th>Metformin (MET)</th>
<th>DPP4 Inhibitor*</th>
<th>GLP-1 Agonist (Incretin Mimetic)</th>
<th>Sulfonylurea (SU)</th>
<th>Glinide**</th>
<th>Thiazolidinedione (TZD)</th>
<th>Colesevelam</th>
<th>Alpha-glucosidase inhibitor (AGI)</th>
<th>Insulin</th>
<th>Pramlintide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postprandial Glucose (PPG) - lowering</td>
<td>Mild</td>
<td>Moderate</td>
<td>Moderate to Marked</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Mild</td>
<td>Mild</td>
<td>Moderate to Marked</td>
<td>Moderate to Marked</td>
<td>Mild</td>
</tr>
<tr>
<td>Fasting glucose (FPG) - lowering</td>
<td>Moderate</td>
<td>Mild</td>
<td>Mild</td>
<td>Moderate</td>
<td>Mild</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Moderate to Marked</td>
<td>Mild</td>
<td></td>
</tr>
<tr>
<td>Nonalcoholic fatty liver disease (NAFLD)</td>
<td>Mild</td>
<td>Neutral</td>
<td>Mild</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Hypoglycemia</th>
<th>Gastrointestinal Symptoms</th>
<th>Risk of use with renal insufficiency</th>
<th>Contraindicated in Liver Failure or Prediposition to Lactic Acidosis</th>
<th>Heart failure / Edema</th>
<th>Weight Gain</th>
<th>Fractures</th>
<th>Drug-Drug interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neut</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Mild</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate to Severe</td>
</tr>
<tr>
<td>Moderate</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate</td>
</tr>
<tr>
<td>Severe</td>
<td>Reduce Dosage</td>
<td>Moderate</td>
<td>Mild</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>Severe</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate</td>
</tr>
<tr>
<td>Use with caution in CHF</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
<tr>
<td>Benefit</td>
<td>Neutral</td>
<td>Benefit</td>
<td>Mild</td>
<td>Mild</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Mild to Moderate</td>
<td>Benefit</td>
</tr>
<tr>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

* The abbreviations used here correspond to those used in the algorithm (Fig. 1).
** The term ‘glinide’ includes both repaglinide and nateglinide.
Insulin-Based Versus Triple Oral Therapy for Newly Diagnosed Type 2 Diabetes

Which is better?

ILDIKO LINGVAY, MD, MPH, MScS1
JAIME L. LEGENDRE, BS1
POLINA F. KALOYANOVA, MD1
SONG ZHANG, PHD2
BEVERLEY ADAMS-HUET, MS1,2
PHILIP RASKIN, MD1

OBJECTIVE — Early use of insulin after diagnosis of type 2 diabetes is met with resistance because of associated weight gain, hypoglycemia, and fear of decreased compliance and quality of life (QoL).

RESEARCH DESIGN AND METHODS — In treatment-naïve patients with newly diagnosed type 2 diabetes, insulin and metformin were initiated for a 3-month lead-in period, then patients were randomly assigned to insulin and metformin (insulin group) or metformin, pioglitazone, and glyburide (oral group) for 36 months. Hypoglycemic events, compliance, A1C, weight, QoL, and treatment satisfaction were assessed.

RESULTS — Of 29 patients randomly assigned into each group, 83% (insulin group) and 72% (oral group) completed this 3-year study. At study completion, A1C was 6.1 ± 0.6% (insulin group) versus 6.0 ± 0.8% (oral group). Weight increased similarly in both groups (P = 0.09) by 4.47 kg (95% CI 0.89–8.04 kg) (insulin group) and 7.15 kg (95% CI 4.18–10.13 kg) (oral group). Hypoglycemic events did not differ between groups (mild: 0.51 event/person-month in the insulin group vs. 0.68 event/person-month in the oral group, P = 0.18 and severe: 0.04 event/person-year in the insulin group vs. 0.09 event/person-year in the oral group, P = 0.53). Compliance, QoL, and treatment satisfaction were similar between groups, with 100% of patients randomly assigned to insulin willing to continue such treatment.

CONCLUSIONS — When compared with a clinically equivalent treatment regimen, insulin-based therapy is effective and did not cause greater weight gain or hypoglycemia nor decrease compliance, treatment satisfaction, or QoL. Insulin is safe, well-accepted, and effective for ongoing treatment of patients with newly diagnosed type 2 diabetes.

Diabetes Care 32:1789–1795, 2009

therapy required insulin therapy within 4 years (8).

Insulin is the most effective hypoglycemic agent in our treatment armamentarium and is now recommended by the American Diabetes Association (ADA) guidelines (9) as the second agent after metformin. Insulin is also thought to protect β-cell function decline (10) and therefore exerting a “disease-modifying” effect. Yet there is resistance to insulin initiation among physicians and patients alike, not only as an early treatment option but also when oral hypoglycemic agents fail to control glucose levels.

Some commonly cited barriers to insulin initiation are patient fear of disease progression and needle anxiety, as well as patient and provider fears of weight gain and hypoglycemic episodes (12). For these reasons, insulin has traditionally been viewed as a last resort for patients who fail to maintain glycemic control with diet and oral hypoglycemic drugs.

However, previous studies have shown comparable weight gain, edema, and lipid changes in a comparison of insulin glargine or rosiglitazone added to an initial regimen of sulfonylurea and thiazolidinedione. (13–16)
Burning Question

HOW SHOULD INSULIN BE INITIATED?
AND
SHOULD I GO BASAL OR BOLUS?
Insulin Initiation Calculations – Basal Insulin

- Generally the initial choice for insulin therapy
- Goal of basal insulin is to suppress hepatic glucose production and improve fasting hyperglycemia
- Glargine and determir are preferred due to peakless time action curves which translates into less hypoglycemia
- Start with a set dosage
  - Example: Glargine 10 units daily
- Weight based Calculation
  - 0.3 units per kg for augmentation
  - (compared to 0.6-1.0 for replacement as in T1DM)
Goal Blood Sugars – ADA – General Population

<table>
<thead>
<tr>
<th>Situation</th>
<th>Goal Blood Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Blood Glucose</td>
<td>90-130</td>
</tr>
<tr>
<td>Postprandial Blood Glucose</td>
<td>Less than 180</td>
</tr>
</tbody>
</table>
# Table 1. Pharmacokinetic Profiles of Insulin Therapies

<table>
<thead>
<tr>
<th>Insulin type</th>
<th>Onset</th>
<th>Peak</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Long-acting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detemir (Levemir)</td>
<td>3 to 4 hours</td>
<td>6 to 8 hours</td>
<td>6 to 23 hours</td>
</tr>
<tr>
<td>Glargine (Lantus)</td>
<td>90 minutes</td>
<td>None</td>
<td>24 hours</td>
</tr>
<tr>
<td><strong>Intermediate-acting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPH (Humulin N)</td>
<td>1 to 2 hours</td>
<td>4 to 10 hours</td>
<td>14 or more hours</td>
</tr>
<tr>
<td><strong>Short-acting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspart (Novolog)</td>
<td>15 minutes</td>
<td>1 to 3 hours</td>
<td>3 to 5 hours</td>
</tr>
<tr>
<td>Glulisine (Apidra)</td>
<td>15 to 30 minutes</td>
<td>30 to 60 minutes</td>
<td>4 hours</td>
</tr>
<tr>
<td>Lispro (Humalog)</td>
<td>15 minutes</td>
<td>30 to 90 minutes</td>
<td>3 to 5 hours</td>
</tr>
<tr>
<td>Regular</td>
<td>30 to 60 minutes</td>
<td>2 to 4 hours</td>
<td>5 to 8 hours</td>
</tr>
<tr>
<td><strong>Mixed</strong>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPH/lispro or aspart</td>
<td>15 to 30 minutes</td>
<td>Dual</td>
<td>14 to 24 hours</td>
</tr>
<tr>
<td>NPH/regular</td>
<td>30 to 60 minutes</td>
<td>Dual</td>
<td>14 to 24 hours</td>
</tr>
</tbody>
</table>

*—NPH/regular: Humulin 70/30, Novolin 70/30, Humulin 50/50; NPH/lispro or aspart: Humalog 75/25, Novolog 70/30, Humalog 50/50.

When to Initiate Bolus Insulin

- Done in conjunction with basal insulin (not only bolus)
  - Would you only have a persistent asthmatic on albuterol??
- Involve multiple injections a day
  - The basal injection plus bolus for meals = 4 injections/day at least
- May be more efficacious and provide greater flexibility when meal times and carbohydrate loads vary
- Dose can start at either 5 units of fast acting insulin or about 7% of basal dose
Consider Groups!

- Patient came to a treatment center for education, administration, and self-adjustment
- A1c went from 8.8-6.8 in group trainings
- 48% less time spent doing the group care compared to total individual training
- Used glargine

Initiate Insulin by Aggressive Titration and Education (INITIATE)

A randomized study to compare initiation of insulin combination therapy in type 2 diabetic patients individually and in groups

Objective — Insulin is often postponed for years because initiation is time-consuming. We sought to compare initiation of insulin individually and in groups with respect to change in A1C and several other parameters in type 2 diabetic patients.

Research Design and Methods — A randomized (1:1), multicenter, two-arm, parallel design study with a recruiting period of up to 14 weeks and a 24-week treatment period. Either in groups of 4–8 or individually, using the same personnel and education program, 121 insulin-naive type 2 diabetic patients with an A1C of 7.0–12.0% were randomized to initiate bedtime insulin glargine. The patients visited the treatment center before and at the time of insulin initiation and at 6, 12, and 24 weeks. Patients self-adjusted the insulin dose to achieve a fasting plasma glucose 4.0–5.5 mmol/l.

Results — At 24 weeks, mean ± SE A1C had decreased from 8.7 ± 0.2 to 6.9 ± 0.1% in those treated individually and from 8.8 ± 0.2 to 6.8 ± 0.1% in those in groups (not significant [NS]). Insulin doses averaged 62 ± 5 IU and 56 ± 5 IU at 24 weeks (NS), respectively. The frequency of hypoglycemia was similar. The total time (visits and phone calls) spent in initiating insulin in the patients in groups (2.2 ± 0.1 h) was 48% less than in those treated individually (4.2 ± 0.2 h). Diabetes treatment satisfaction improved significantly in both sets of patients.

Conclusions — Similar glycemic control and treatment satisfaction can be achieved by initiating insulin in groups and individually. Starting insulin in groups takes one-half as much time as individual initiation.

Diabetes Care 30:1364–1369, 2007
Burning Question

HOW SHOULD INSULIN BE TITRATED?
Insulin Titration

- At every office visit? Too Slow!
  - Allow patients a longer time outside of goal range
  - Does not empower or engage the patient
  - Allows for the clinical enertia
Insulin Titration

• Allow the patient to adjust based on their glucose readings
  – Check fasting glucose daily and increase the dose by (2) units every (3) days until fasting levels are at goal (70-130)
  – Can increase by greater amount if fasting sugars > 180; (4) units every (3) days
  – If hypoglycemia occurs, reduce dose by 4 units or 10%, whatever greatest
  – Rules apply for both basal and bolus insulin although usually your basal dose should be higher than bolus dose
    • If bolus dose gets high, you could adjust to half is basal and half bolus
  – Consider making a handout for the patient with these instructions
Table 4. Treat-to-Target Trial’s Titration Schedule for Basal Insulin in Patients with Diabetes Mellitus

<table>
<thead>
<tr>
<th>Fasting glucose level</th>
<th>Increase in basal insulin</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 to 140 mg per dL (6.66 to 7.77 mmol per L)</td>
<td>2 units</td>
</tr>
<tr>
<td>141 to 160 mg per dL (7.83 to 8.88 mmol per L)</td>
<td>4 units</td>
</tr>
<tr>
<td>161 to 180 mg per dL (8.94 to 9.99 mmol per L)</td>
<td>6 units</td>
</tr>
<tr>
<td>&gt; 180 mg per dL (9.99 mmol per L)</td>
<td>8 units</td>
</tr>
</tbody>
</table>

Titrating Bolus Insulin

• Before meal insulin dose can be titrated upward 2-3 units every 2-3 days based on postprandial glucose and/or taking into account before meal glucose level

• Consider calculating total insulin amount and ensuring at least 50% of dose is basal

• Example:
  – Patient with fasting BS 160 and postprandial BS 214/200/230
  – Lantus at 20 units qhs with 15 units of Humalog each meal
  – Total insulin at this point is 65 units with inadequate control
  – Could make regimen Lantus 35 units qhs with 10 Humalog qmeal
Burning Question

WHAT ABOUT INSULIN PUMPS?
Insulin Pumps

- Provides maximum flexibility with regards to meals, exercise, and travel
- “The walking insulin drip”
- Insurance limitations
- More often in Type I who need replacement than Type II with resistance/augmentation
- Should at least be explained in a patient-centered approach
WHAT ARE THE PATIENT AND PROVIDER BARRIERS PREVENT ACCEPTANCE OF INSULIN?
Some Notes from DAWN Study
Cross National Type 2 Diabetes Attitudes, Wishes and Needs study – Diabetes Care 2005

• Patients rate clinical efficacy of insulin low and view themselves as a failure if they needed insulin
• Self-blame is lower in diabetics with good diet/exercise habits
• Some diabetics with complications view insulin as potential beneficial
• Most nurses and general practitioners delay insulin until “absolutely necessary”
  – USA had the second highest endorsement of this statement
  – #1 = India
  – Interestingly, USA patients where highest with “self-blame”
• Delay to use insulin is less when clinician perceives patient as “compliant”
• Kinds sounds like that clinical inertia stuff we heard from BP challenge...
Factors Negatively Impacting Patient Utilization of Insulin

FEAR
Factors Negatively Impacting Patient Utilization of Insulin

FINANCIAL EDUCATIONAL ADVERSE EFFECTS REPERCUSSIONS

Patient FEARS

Clinician FEARS
FEAR - Financial

- The American Diabetes Association reports that the typical monthly cost to treat diabetes runs from $350 to $900 for those who do not have insurance
- NPH = $22-50 per 1000 unit vial
- Detemir/Glargine = $70-90 per 1000 unit vial
- Detemir/Glargine pens = $170-200 for 5 pens (1500 units)

- Clinicians may also be considered about cost burdens to their patients
FEAR - Educational

• Patients also may not be familiar with how to administer insulin
  – Drawing up the insulin
  – Use of needle
  – Rotating sites
  – Amount and timing of injections

• Clinicians may be concerned may be that regimen may too complex or burdensome on patient

• Does patient have the educational or social support level to do this?
• May not have the personal education to teach how to inject
• May not have enough or trained staff to teach how to inject
FEAR – Adverse Effects

• Patient may have legitimate concerns about life on insulin
  – Weight gain
  – Hypoglycemia
  – Pain from injections

• Clinicians may share the same concerns for their patients
  – Avoid weight gain in already obese patients
  – Will sugars be driven so low to cause complications?
FEAR – Repercussion – What Does This Mean to Me?

• Patients may hold irrational beliefs about the need for insulin for their glycemic control has on their life
  – Now that I need the needle, life will be less flexible or enjoyable
  – How can I combine all the sugar testing and insulin supplies into life
  – I will become addicted to insulin
  – This is the beginning of the deterioration of my health
    • 35% of patients believed insulin caused blindness, renal failure, amputations, heart attacks, strokes, or early death *
  – They are a failure because they need insulin

• Will regimen be so burdensome to foster noncompliance
• Will it induce depression because patient feels like a failure

Barriers to Insulin Initiation - Diabetes Care 2010
<table>
<thead>
<tr>
<th>Stated moderate/extreme concerns (versus not at all or a little concerned) regarding:</th>
<th>Nonadherent</th>
<th>Adherent</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of insulin shots</td>
<td>12/51 (24)</td>
<td>22/82 (27)</td>
</tr>
<tr>
<td>How insulin shots might restrict your activities or “hold back” your lifestyle</td>
<td>20/54 (37)</td>
<td>20/82 (24)</td>
</tr>
<tr>
<td>The additional burden associated with home monitoring of blood sugar</td>
<td>15/59 (25)</td>
<td>19/82 (23)</td>
</tr>
<tr>
<td>Difficulty giving insulin due to things like poor eyesight, shakiness, or arthritis</td>
<td>23/55 (42)</td>
<td>24/81 (30)</td>
</tr>
<tr>
<td>Your ability to make dose adjustments†</td>
<td>22/54 (41)</td>
<td>10/82 (12)</td>
</tr>
<tr>
<td>How insulin shots may negatively impact your social life†</td>
<td>21/56 (38)</td>
<td>15/82 (18)</td>
</tr>
<tr>
<td>A negative impact on your job (if you work outside the home)†</td>
<td>15/45 (33)</td>
<td>6/72 (8)</td>
</tr>
<tr>
<td>The insulin shots being painful†</td>
<td>17/56 (30)</td>
<td>12/82 (15)</td>
</tr>
<tr>
<td>Possible side effects of giving yourself shots†</td>
<td>24/55 (44)</td>
<td>10/82 (12)</td>
</tr>
<tr>
<td>Insulin shots causing you to have low blood glucose†</td>
<td>22/51 (43)</td>
<td>13/81 (16)</td>
</tr>
</tbody>
</table>

**Patient-provider interactions and communication**

<table>
<thead>
<tr>
<th>Never or only sometimes (versus usually or always) felt confidence or trust in personal physician that manages diabetes</th>
<th>Nonadherent</th>
<th>Adherent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11/68 (16)</td>
<td>11/97 (11)</td>
</tr>
<tr>
<td>Moderately or extremely difficult (versus not at all difficult or a little difficult) to talk with doctor about concerns about diabetes medication or insulin</td>
<td>9/66 (14)</td>
<td>10/100 (10)</td>
</tr>
<tr>
<td>Risks and benefits were not very well or not well at all (versus somewhat well or very well) explained†</td>
<td>37/67 (55)</td>
<td>37/96 (39)</td>
</tr>
<tr>
<td>Inadequate health literacy: sometimes, often, or always (versus never or rarely); have problems learning about medical condition because of difficulty understanding written information (not including problems due to poor vision)†</td>
<td>35/69 (51)</td>
<td>30/99 (30)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How was the insulin self-management training provided</th>
<th>Nonadherent</th>
<th>Adherent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor trained†</td>
<td>1/66 (2)</td>
<td>13/77 (17)</td>
</tr>
<tr>
<td>Insulin self-management class†</td>
<td>5/66 (8)</td>
<td>31/77 (40)</td>
</tr>
<tr>
<td>Nurse trained†</td>
<td>4/66 (6)</td>
<td>33/77 (43)</td>
</tr>
</tbody>
</table>

Data are n/N (%). *N takes into account missing responses. †Significant contrasts (P < 0.05).
Humor Me For a Moment – What is FEAR?

- a distressing emotion aroused by impending danger, evil, pain, etc., whether the threat is real or imagined; the feeling or condition of being afraid. Synonyms: foreboding, apprehension, consternation, dismay, dread, terror, fright, panic, horror, trepidation, qualm
- There is a certain amount of solitude in FEAR – being alone in it
- Not surrounded by goodness
So then the Opposite of Fear Could Be - LOVE

- Ok – per Dictionary.com it’s Bravery but…
- There is no FEAR in LOVE
- You are not alone in LOVE
- Surrounded by goodness
- Makes for the acronym to combat the FEAR of starting insulin
Way to Encourage Acceptance Towards Patient Utilization of Insulin

LISTEN
OFFER
VALIDATE
EDUCATE
LOVE - Listen

Ogres are like onions. Ogres have layers. Onions have layers. You get it? We both have layers.
**LOVE - Offer**

- Dependent on the FEAR, offer options to overcome
  - Consider cheaper insulins (70/30 or NPH)
  - Work with SW or drug companies for assistance
  - Show videos on ease of insulin administration
    [video link](http://www.youtube.com/watch?v=KP6Zm9vl3FM&feature=related)
  - Consider use of insulin pens – easy storage, simple clicks
    [video link](http://www.youtube.com/watch?v=CIHQ1WETDsU)
  - Schedule time for an insulin training, group visit, care manager

  - **UNLEASH THE MEDICAL HOME**
  - Emphasize diet and exercise to minimize weight gain…glucophage
  - Adjust goals to meet patient’s needs, set mutual, attainable goals
  - Discount untruths and remove stigma as much as possible
**LOVE - Offer**

What you offer is based on the fear

<table>
<thead>
<tr>
<th>Fear</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>I cannot do it</td>
<td>Explore what ‘it’ is</td>
</tr>
<tr>
<td></td>
<td>Respect individual resources and competences</td>
</tr>
<tr>
<td></td>
<td>Express conviction that he/she will be able to learn it</td>
</tr>
<tr>
<td></td>
<td>Explore possibilities of support (diabetes nurse, family)</td>
</tr>
<tr>
<td></td>
<td>Offer a trial period</td>
</tr>
<tr>
<td>Hypoglycaemic events</td>
<td>Express conviction that prophylaxis and treatment of hypos can be learned</td>
</tr>
<tr>
<td></td>
<td>Realistic description of potential harm and life-threatening potential</td>
</tr>
<tr>
<td>Dependence on injection schedule</td>
<td>Explain benefits of prandial regimes</td>
</tr>
<tr>
<td>Vocational restrictions</td>
<td>Inform about legal issues (e.g. driving)</td>
</tr>
<tr>
<td></td>
<td>Explore solutions for the worst case</td>
</tr>
<tr>
<td>Injection</td>
<td>Demonstrate pen and needle</td>
</tr>
<tr>
<td></td>
<td>Explain injection technique — Let the patient touch the device</td>
</tr>
<tr>
<td></td>
<td>Initial injection without insulin</td>
</tr>
<tr>
<td>Now diabetic complications will occur</td>
<td>Explore any influential negative experiences the patient may have had</td>
</tr>
<tr>
<td></td>
<td>Explain that insulin helps to reduce the likelihood of complications</td>
</tr>
<tr>
<td>Weight gain</td>
<td>Inform about weight loss during hyperglycaemia</td>
</tr>
<tr>
<td></td>
<td>Reiterate dietary issues</td>
</tr>
<tr>
<td>Injecting in public</td>
<td>Explain possibilities of discretion</td>
</tr>
<tr>
<td></td>
<td>Let the patient define his special situations</td>
</tr>
<tr>
<td></td>
<td>Respect the courage needed in the beginning to inject in public</td>
</tr>
<tr>
<td>Now being seriously ill</td>
<td>Listen actively</td>
</tr>
<tr>
<td></td>
<td>Express your understanding</td>
</tr>
<tr>
<td></td>
<td>Express hope</td>
</tr>
<tr>
<td></td>
<td>T2DM is serious from the beginning, not because insulin is initiated —</td>
</tr>
<tr>
<td></td>
<td>insulin as a chance to stay healthy</td>
</tr>
<tr>
<td>Guilt</td>
<td>Explain natural course of diabetes</td>
</tr>
<tr>
<td></td>
<td>Insulin is not a punishment, it is the best option</td>
</tr>
<tr>
<td></td>
<td>To value the future over the past</td>
</tr>
</tbody>
</table>
Addressing patient resistance to insulin therapy for patients with type 2 diabetes

| Patient concerned with pain from injection          | Minimal with thinner, smaller needles |
| Use of insulin pens                               |
| Patient worried that starting insulin signifies worsening diabetes |
| Diabetes is a progressive disease                 |
| Taking insulin will control blood glucose and help prevent complications |
| Taking insulin may slow down the rate of beta cell failure |
| Patient believes that need for insulin signifies patient failure to follow treatment regimen |
| Diabetes is a progressive disease; beta cell activity declines over time |
| Not related to patient compliance                 |
| Patient fears low blood sugar reactions           |
| Explain that severe hypoglycemia is rare in type 2 diabetes |
| Self-monitoring glucose levels                    |
| Explain how to avoid and how to treat hypoglycemia |
| Patient concerned that taking insulin will upset daily routine |
| Address specific concerns                         |
| Taking insulin may be less intrusive than complicated drug regimens |
| Patient believes that insulin will decrease his/her quality of life |
| Benefits from glucose control: more energy, better sleep, overall well-being |
| Patient thinks insulin will lead to diabetic complications |
| Discuss role of insulin in reducing risk of diabetic complications |
| Patient concerned that he/she will be treated differently by friends and family |
| Educate friends and family: offer reading materials on diabetes, support groups for family |
| Patient has heard insulin causes weight gain       |
| Role of diet and exercise                         |
| Patient wants a more natural alternative therapy  |
| Insulin is the most natural therapy for diabetes. It is replacing the hormone that the patient does not make enough of. |

LOVE - Validate

- Confirm with the patient that this is a big step for them
- Value their side of things
- May feel like drinking through a fire hydrant
- Remind them they are not alone in the process
LOVE - Educate

• Explain what insulin is and how your body makes/needs it
• Discuss insulin resistance – the “rusty gates”
• Discuss titration to goal
• Discuss if other medications are to be continued or stopped
• Review, review, review as it may take some time for comprehension
• Patient handouts and/or internet links for learning out of office
• Continuing education for yourself and staff (especially on administration of insulin)
  – “You can’t give what you don’t possess”
Follow Up – From FEAR to LOVE

• Frequent follow-up in the office, not just with the doc
  – Nursing - Care Manager
  – SW - Pharmacist
  – Diabetic Educator - Group Care

• Consider out of office follow-up
  – Phone call
  – Patient emails
Showing Some **LOVE** to the Office V

- Involve the whole team in educational initiatives
  - Workshops
  - Conferences
  - Case Reviews

*Not just for diabetes*

*Also for motivational interviewing, patient centeredness, etc*

- Connect with your specialists for help
  - Can they spare a diabetic educator to teach your staff/patients?
  - Dedicated line for rapid consultations?
Burning Question

DO WE CONTINUE ORAL MEDICATIONS WITH PATIENTS ON INSULIN?
Metformin

- Proven safe and effective in combination with insulin
- Reduces cardiovascular risk in overweight patients with T2DM
- Associated with:
  - decreased weight gain
  - lower insulin dosage
  - less hypoglycemia
Thiazolidinediones

- Improve insulin sensitivity
- May increase weight gain and risk of CHF
- Maybe associated with increased fracture risk*
- Not shown to reduce macrovascular complications
- Not shown to reduce all cause mortality

* = Diabetes Care May 2008 vol. 31 no. 5 845-851
Alpha glucosidase inhibitors

- Delay absorption of carbohydrates from GI tract
- Decrease post-prandial hyperglycemia
- Safe and effective when combined with insulin
Sulfonylureas

- Can be combined with insulin
- Possible increased risk of hypoglycemia
- Need for insulin may reflect ineffectiveness of this category
- May be better to use prandial insulin then this class
DPP-4 Inhibitors

- Only one FDA approved for combination with insulin is sitagliptin (Januvia) to improve fasting and postprandial glucose levels
- No improvement in macrovascular event reduction
- No reduction in all cause mortality
Burning Question

DOES ALL THIS STUFF MATTER?
With sufficient doses and lifestyle modification, insulin can reduce ANY level of A1c to the therapeutic goal.

However, only 41% of patients studied got A1c to goal within 5 months.

Key to glycemic success is intensification of therapy quickly.
Burning Question

WHEN WILL WE MAKE A CHANGE?
Fighting the Clinical Inertia

- We know why to start insulin
- We know how to start insulin
- We know what insulin to start
- When will we start?
Conclusion

• Introduce the concept of insulin at diabetes diagnosis – “salad bar”
• Peel back the layers of the onion to identify the FEAR
• Share the LOVE to overcome patient and provider FEAR
• Develop pathways for initiation and intensification
• Utilize your whole Medical Home and Neighborhood in the process
I can name at least 3 barriers that patients have expressed for not adhering to their insulin regime.

1. Strongly Agree
2. Agree
3. Unsure
4. Disagree
5. Strongly Disagree
I am equipped to provide solutions to increase patient adherence.

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree
Please Rate the overall Speaker Ability. (Results not shown)

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree
The information presented is directly applicable to patient care and practice behavior.

1. Strongly Agree  20%
2. Agree  20%
3. Neutral  20%
4. Disagree  20%
5. Strongly Disagree  20%

Answer Now
Burning Question

WHAT ARE YOUR BURNING QUESTIONS?