Learning Lab: Focus on the 2019 Diabetes Adapted Clinical Guidelines

LAWRENCE CHANG, PharmD
DARLENE M. JENKINS, DrPH, RD, CHES
AMBER RICHERT, DNP, FNP-BC
Welcome & Introductions
Who are we?

• Most of us are clinicians
• Some of us are case managers
• Some of us are care coordinators
• Some of us are executives
• Some of us are board members
• All of us are a part of the multi-disciplinary team that ensures the health and well-being of clients who are experiencing homelessness
What do we hope to gain from this session?

• Recognizing warning signs
• Causes and treatment of diabetes
• Clinical application of updated guidelines
• Addressing the special needs of diabetic clients experiencing homelessness
• Available resources
• Tools for client engagement
• Best practices & shared learning
Agenda

• Session 1: DIABETES MANAGEMENT
  ▪ Risk Factors/Signs and Symptoms
  ▪ Updated Recommendations for Care
  ▪ Treatment for Clients at Risk, Prediabetes, Diabetes

• Session 2: MEDICATION MANAGEMENT

• Session 3: FACING THE CHALLENGES
  ▪ Food Insecurity and Healthy Food Choices (soup kitchens, shelters and pantries)
  ▪ Mental Illness, Substance Use Disorders
  ▪ Engaging and Establishing Relationships
Session 1
DIABETES MANAGEMENT
Risk Factors, Signs, and Symptoms

• Increased hunger, thirst and urination
• Slowly healing abrasions, cuts and wounds
• Numbness or tingling in hands and feet
Risk Factors, Signs, and Symptoms

- Hypertension
- High cholesterol
- Overweight/obesity
- Persons who do not identify as white or Caucasian
- First degree family member with diabetes
Risk Factors, Signs, and Symptoms

Symptoms of hypoglycemia:
- Racing pulse
- Cold sweats, pale face
- Headache
- Feeling incredibly hungry
- Shivering, feeling weak in the knees
- Feeling restless, nervous or anxious
- Difficulty concentrating, confusion

Symptoms of hyperglycemia:
- Extreme thirst
- Frequent urination
- Feeling tired
- Listlessness
- Nausea
- Dizziness
Updated Recommendations for Care: Testing for DM

• Overweight or obese adults
• High-risk race/ethnicity
• Clients with history of
  • Cardiovascular disease
  • Hypertension
  • High Cholesterol
  • Physical inactivity
  • Other clinical conditions associated with insulin
• Women with polycystic ovary syndrome
Updated Recommendations for Care: Glycemic Goals & Monitoring

- **Patient / Disease Features**
  - **Risks potentially associated with hypoglycemia and other drug adverse effects**
    - More stringent → A1C 7% → Less stringent
    - Low → high
  - **Disease duration**
    - Newly diagnosed → long-standing
  - **Life expectancy**
    - Long → short
  - **Important comorbidities**
    - Absent → few / mild → severe
  - **Established vascular complications**
    - Absent → few / mild → severe
  - **Patient preference**
    - Highly motivated, excellent self-care capabilities → preference for less burdensome therapy
  - **Resources and support system**
    - Readily available → limited
# Updated Recommendations for Care

<table>
<thead>
<tr>
<th>Overall Health Category</th>
<th>Group 1: Good Health</th>
<th>Group 2: Intermediate Health</th>
<th>Group 3: Poor Health</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No comorbidities or 1-2 non-diabetes chronic illnesses* and No ADL impairments and ≤1 IADL impairment</td>
<td>3 or more non-diabetes chronic illnesses* <strong>and/or</strong> Any one of the following: mild cognitive impairment or early dementia ≥2 IADL impairments</td>
<td>Any one of the following: End-stage medical condition(s)** Moderate to severe dementia ≥2 ADL impairments Residence in a long-term nursing facility</td>
</tr>
</tbody>
</table>

**Reasonable glucose target ranges and HbA1c by group**

- **Shared decision-making: individualized goal may be lower or higher**
- **Use of drugs that may cause hypoglycemia (e.g., insulin, sulfonylurea, glinides):**
  - **No**
    - Fasting: 90-130 mg/dL
    - Bedtime: 90-150 mg/dL
    - <7.5%<br>
    - Fasting: 90-150 mg/dL
    - Bedtime: 100-180 mg/dL
    - <8%<br>
    - Fasting: 100-180 mg/dL
    - Bedtime: 110-200 mg/dL
    - <8.5%*<br>
  - **Yes**
    - Fasting: 90-150 mg/dL
    - Bedtime: 100-180 mg/dL
    - ≥7.0 and <7.5%<br>
    - Fasting: 100-150 mg/dL
    - Bedtime: 150-180 mg/dL
    - ≥7.5 and <8.0%<br>
    - Fasting: 100-180 mg/dL
    - Bedtime: 150-250 mg/dL
    - ≥8.0 and <8.5%*<br>
Treatment for Clients at Risk, Prediabetes, Diabetes

• Requires lifestyle modifications and behavior change.
• Most successful when it involves evidence-based behavior change techniques, such as:
  • shared-decision making,
  • assessing the stages of change,
  • cognitive behavioral therapy, and
  • motivational interviewing.
Treatment for Clients at Risk, Prediabetes, Diabetes

• Maintaining a Healthy Weight

The American Diabetes Association: Standards of Medical Care in Diabetes-2019 includes the following recommendations regarding Lifestyle Management:

“...... all people with diabetes should participate in diabetes self-management education to facilitate the knowledge, skills, and ability necessary for diabetes self-care. Diabetes self-management support is additionally recommended to assist with implementing and sustaining skills and behaviors needed for ongoing self-management.”

“All individuals with diabetes should be offered a referral for individualized MNT, preferably provided by a registered dietitian (RDN) who is knowledgeable and skilled in providing diabetes-specific MNT.”
Treatment for Clients at Risk, Prediabetes, Diabetes

• Physical Activity

• Patient Education and Self-Management

✓ Four critical times to evaluate the need for diabetes self-management education and support:

1. at diagnosis,
2. annually,
3. when complicating factors arise, and
4. when transitions in care occur.
Maintaining a Healthy Weight: Diet and Nutrition

- Refer patient to a Registered Dietitian for Medical Nutrition Therapy and follow-up.

- To keep energized throughout the day, assess how often the patient is able to eat three meals plus one to two healthy small snacks?

- For a healthy balance, does the patient have access to meals and snacks that are roughly 50% veggies and fruit, 25% whole grains (at least half the time) and 25% lean protein (fish, lean meats, beans, eggs)?

- To stay hydrated, is the patient able to drink water before, during and after being active?
Maintaining a Healthy Weight: Diet and Nutrition

• To maintain energy for exercising, is the patient able to exercise one to three hours after eating a meal or have a small healthy snack one to two hours before being active?

• Is the patient able to consume extra fats such as oil, butter, margarine, salad dressings, gravies and creamy sauces in smaller amounts (30 -45 mL or two – three tbsp per day – includes the amounts used for cooking)?

• When filling a plate, is the patient able to watch portion sizes and try to fill up on veggies, fruits, whole grains and lean proteins most often?

• Is the patient able to read and understand food labels to choose foods higher in fiber, lower in calories, saturated and trans fats and sodium?
Maintaining a Healthy Weight: Diet and Nutrition

• Assess where and when patients are eating, and the frequency and healthfulness of meals.

• Recognize that patients may choose to eat at local fast food restaurants and provide them with a list of healthier food choices available within these locations.

• Provide suitable documentation for the patient with diabetes to use at food pantries, soup kitchens and shelters to obtain healthful snacks and foods.
Maintaining a Healthy Weight: Diet and Nutrition

• Encourage patients to make the best choices they can from what is available, for example, taking a smaller portion of macaroni and cheese and a larger portion of vegetables.

• Ask patients to save part of the meal for later when only one or two meals are available per day.

• Provide multivitamins with minerals.

• Acknowledge the patients’ limitations given food choices and work to adjust medications to address glucose control.
Maintaining a Healthy Weight: Physical Activity

• Remind the patient that regular exercise is part of the diabetes treatment plan.
• Chart how far the patient walks daily.
• When appropriate, suggest that the patient take steps instead of elevators.
• Assess the condition of the patient’s shoes and socks at every visit.
• Research possibilities for exercise monitors such as pedometers and options such as the YMCA or other local fitness centers that can offer membership at reduced rates.
Maintaining a Healthy Weight: Physical Activity

• Provide examples of strength exercises that can be performed without special equipment, such as those recommended by the National Institutes of Health

• Provide examples of balance exercises that can be performed without special equipment, such as those recommended by the National Institutes of Health

• Provide examples of stretching exercises that can be performed without special equipment, such as those recommended by the National Institutes of Health
Treatment for Clients at Risk, Prediabetes, Diabetes

• Criteria for Testing for Diabetes or Prediabetes in Asymptomatic Adults:

  ✓ Patients with prediabetes (HbA1C greater than or equal to 5.7% [39 mmol/mol], IGT, or IFG) should be tested annually.

  ✓ Female patients who have been diagnosed with GDM should have lifelong testing at least every 3 years.

  ✓ Patients who are considered overweight or obese (BMI greater than or equal to 25 kg/m2 or greater than or equal to 23 kg.m2 in Asian Americans) should be tested for diabetes.

  ✓ For all other patients, testing should begin at age 45 years.
Treatment for Clients at Risk, Prediabetes, Diabetes

Lab Tests and Specialty Services

• Fasting Plasma Glucose (FPG) -- This test gives a blood glucose reading for a moment in time. A patient is considered to be fasting when they have not had anything to eat or drink (except water) for at least 8 hours.

• Hemoglobin A1C -- This test provides an average blood glucose over the last three months. An HbA1C does not require the patient to fast, and provides a better indication of true blood glucose control, especially in persons who are food insecure.
Breakout 1: Shared Learning

Some of the questions you posed include:

• What are emergency symptoms we should watch for?

• Primary causes of diabetes in the homeless community and how best to manage it.

• Causes, prevention and treatment of diabetes among the homeless population.

• Intro into DM management in homeless population.
Session 2
MEDICATION MANAGEMENT
Medication Adherence

Clinical Strategies to Improve Adherence

• Decrease frequency of DM regimens
• Reduce pill burden
• Utilize medications that promote weight loss
• Remove food requirement
• Minimize risk of hypoglycemia and need to check BG
• Consider need for refrigeration
  • If insulin indicated, insulin pens/pen needles > vials/syringes.
• Freestyle Libre CGM meter
Medication Adherence

Non-Clinical Strategies to Improve Adherence

- Placing stickers on pill bottles
- Pill box
- Blisterpacking medications
Pharmacologic Approaches to Glycemic Treatment

2019 ADA Guidelines
Metformin

First-line therapy

**Pros:**
- Strong efficacy (A1c ↓ 1.5-2%)
- Cardiovascular (CV) Benefit
- No risk of hypoglycemia
- Weight neutral
- ER formulation (once daily)

**Cons:**
- Diarrhea/GI ADRs
- Taken with food (to reduce GI upset)
- IR: Twice daily dosing
- ER: only 500 mg and 750 mg
Metformin and Alcohol

- Increased risk of lactic acidosis (risk factors include: renal impairment, ≥65 years, exposure to contrast, surgery and other procedures, hypoxic states (eg, acute heart failure), excessive alcohol intake, and hepatic impairment.

- Weigh risks and benefits of therapy

- Generally okay if LFTs normal
2016 ADA Guidelines
Insurance Coverage

Know your formularies!

- https://www.formularylookup.com/
- Formularies are typically accessible online

Common Abbreviations
- PA = Prior Authorization (www.covermymeds.com)
- ST = Step Therapy
- QL = Quantity Limit
Pharmacologic Overview

Mechanisms of Action:

- Metformin
  - ↑ Glucose uptake
- TZDs
  - ↑ Glucose uptake
- Meglitinides, Sulphonylureas
  - ↑ Insulin release
- DPP-4i, GLP-1RA
  - ↓ Glucagon secretion
  - ↑ Insulin secretion
- TZDs
  - ↑ Insulin sensitivity
- Metformin
  - ↓ Gluconeogenesis
- SGLT-2i
  - ↑ Renal glucose excretion
- TZDs
  - ↑ Glucose uptake
- GLP-1RA
  - ↓ Gastric emptying
- DPP-4i
  - ↑ GLP-1
- Metformin
  - ↑ GLP-1
  - ↓ Glucose absorption

SGLT2 Inhibitors
SGLT2 Inhibitors

FDA-approved Agents:
- Empagliflozin (Jardiance)
- Canagliflozin (Invokana)
- Dapagliflozin (Farxiga)
- Ertugliflozin (Steglatro)

Clinical Pearl:
- Synjardy XR (empagliflozin-metformin ER)
- Invokamet XR (canagliflozin-metformin ER)
- Xigduo XR (dapagliflozin-metformin ER)
- Segluromet (ertugliflozin-metformin IR)
SGLT2 Inhibitors

Pros:

• Oral, once daily
• Promote weight loss
• CV and Renal benefit
  ➢ Jardiance and Invokana
• Low hypoglycemia risk (if any)
• Modest A1c reduction (↓0.5-1%)
SGLT2 Inhibitors

Cons

Side effects:

• Risk for UTI (females: 18%; males: 4%)
• Genitourinary fungal infection (~4-6%)
• Increased urine output (~3-5%)

• Requires renal function (eGFR>30) to be effective
SGLT2 Inhibitors

FDA Safety Alert (Issued 8/2018)

- “Rare occurrences of Fournier’s Gangrene (necrotizing fasciitis of the perineum)”
- March 2013 to May 2018: 12 cases reported
  - In 2017, an estimated 1.7 million patients received a dispensed prescription for an SGLT2 inhibitor from a retail pharmacy.

Canagliflozin

Black Box Warning (Only Invokana)

• Lower Limb Amputations
  • Approximately 2-fold increased risk
  • CANVAS TRIAL
    • 5.9 out of every 1,000 patients treated with canagliflozin
    • 2.8 out of every 1,000 patients treated with placebo
  • CANVAS-R TRIAL
    • 7.5 out of every 1,000 patients treated with canagliflozin
    • 4.2 out of every 1,000 patients treated with placebo
  • “Prior to initiation consider risk factors for amputation including prior amputation, peripheral vascular disease, neuropathy, and diabetic foot ulcers.”

GLP-1 Agonists and DPP-4 Inhibitors
Pharmacologic Overview

Mechanisms of Action:

- **Metformin**
  - ↑ Glucose uptake
  - ↓ Gluconeogenesis

- **TZDs**
  - ↑ Glucose uptake
  - ↑ Insulin sensitivity

- **Meglitinides, Sulphonylureas**
  - ↑ Insulin release

- **DPP-4i, GLP-1RA**
  - ↓ Glucagon secretion
  - ↑ Insulin secretion

- **TZDs**
  - ↓ Gastric emptying

- **GLP-1RA**
  - ↑ GLP-1
  - ↓ Glucose absorption

- **Metformin**
  - ↑ GLP-1
  - ↓ Glucose excretion

GLP-1 Agonists
• Injectable
• Strong efficacy (A1c ↓1-2%)
• Available once daily/weekly!
• CV Benefit
• Weight Loss
• GI side effects

DPP-4 Inhibitors
• Oral
• Modest efficacy (A1c ↓0.5-1%)
• Once daily
• Alogliptin/Saxagliptin- CHF warning
• Weight Neutral
• Minimal side effects

<table>
<thead>
<tr>
<th>GLP-1 Agonist</th>
<th>DPP-4 Inhibitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once daily:</td>
<td>Renally adjusted:</td>
</tr>
<tr>
<td>Liraglutide (Victoza)</td>
<td>Linagliptin (Tradjenta)</td>
</tr>
<tr>
<td>Lixisenatide (Adlyxin)</td>
<td></td>
</tr>
<tr>
<td>Once weekly:</td>
<td></td>
</tr>
<tr>
<td>Semaglutide (Ozempic)</td>
<td>Alogliptin (Nesina)</td>
</tr>
<tr>
<td>Dulaglutide (Trulicity)</td>
<td>Saxagliptin (Onglyza)</td>
</tr>
<tr>
<td>Exenatide (Bydureon)</td>
<td></td>
</tr>
</tbody>
</table>
Dulaglutide (Trulicity)

Trulicity Steps:
1) Remove gray cap
2) Turn pen from “locked” position to “unlocked”
3) Press green button to inject SQ
Exenatide

**Bydureon Steps:**
1) Attach pen needle
2) Rotate top
3) Hit pen onto palm 10 times, rotate and repeat (hit >80 times)
4) Rotate top again and inject SQ by pressing down on button

**Bydureon BCise Steps:**
1) Shake pen ~15 sec
2) Turn pen from "locked" position to "unlocked"
3) Unscrew orange cap
4) Push auto-injector into skin, wait until device clicks (dose complete)
Semaglutide (Ozempic) and Liraglutide (Victoza)

- Inject like an insulin pen
- **Ozempic (once weekly) COMES WITH pen needles**
- **Victoza (once daily) does NOT come with pen needles and needs separate prescription**
Ozempic vs. Trulicity

• SUSTAIN-7 Trial: Semaglutide superior to dulaglutide in low and high doses

  Change in A1c from baseline (%)
  
<table>
<thead>
<tr>
<th></th>
<th>Semaglutide 0.5 mg</th>
<th>Semaglutide 1.0 mg</th>
<th>Semaglutide 1.5 mg</th>
<th>Dulaglutide 0.75 mg</th>
<th>Dulaglutide 1.0 mg</th>
<th>Dulaglutide 1.5 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>-1.5</td>
<td>-1.1</td>
<td>-1.4</td>
<td>-1.8</td>
<td>-1.4</td>
<td>-1.8</td>
</tr>
<tr>
<td>ETD</td>
<td>-0.40</td>
<td>-0.41</td>
<td>-0.41</td>
<td>-0.55 to -0.25</td>
<td>-0.57 to -0.25</td>
<td>-0.57 to -0.25</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

  Change in weight from baseline (kg)
  
<table>
<thead>
<tr>
<th></th>
<th>Semaglutide 0.5 mg</th>
<th>Semaglutide 1.0 mg</th>
<th>Semaglutide 1.5 mg</th>
<th>Dulaglutide 0.75 mg</th>
<th>Dulaglutide 1.0 mg</th>
<th>Dulaglutide 1.5 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>-4.6</td>
<td>-6.5</td>
<td>-3.0</td>
<td>-2.6</td>
<td>-2.3</td>
<td>-3.0</td>
</tr>
<tr>
<td>ETD</td>
<td>-4.6</td>
<td>-3.55</td>
<td>-3.0</td>
<td>-3.02 to -1.51</td>
<td>-2.78</td>
<td>-3.02 to -1.51</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

• Trulicity is easier to inject than Ozempic
• Patients must tolerate Ozempic 0.25 mg x4 weeks before 0.5 mg dose
GLP-1 Storage

Room Temperature (59°-86°F)

Once *daily* GLP-1 agonists:
- Victoza (liraglutide) = 30 days
- Adlyxin (Lixisenatide) = 14 days

Once *weekly* GLP-1 agonists
- Ozempic (semaglutide) = 56 days
- Trulicity (dulaglutide) = 14 days
- Bydureon (exenatide) = 28 days
GLP-1 Agonists

Cons

**Side effects:**

- Nausea (16-20%)
- Diarrhea (9%)
- Abdominal Pain
- Constipation

Caution in pancreatitis(?)
GLP-1 Agonists

Black Box Warning

Risk of thyroid C-cell tumors

• Seen in male and female rats

• “It is unknown whether dulaglutide causes thyroid C-cell tumors, including medullary thyroid carcinoma (MTC), in humans.”

• Exercise caution if using GLP-1 agonists in patients with history of or genetic predisposition to familial thyroid cancer.
Sulfonylureas (SU) and Thiazolidinediones (TZD)
SUs and TZDs

**Sulfonylureas**
- Strong efficacy (A1c ↓1-2%)
- No renal adjustments (glipizide)
- *High risk* of hypoglycemia
- Weight gain

- Clinical pearl: Recommend *glipizide XL formulation* in patients with food insecurity (if SU indicated).

**Thiazolodinediones**
- Strong efficacy (A1c ↓1-2%)
- No renal adjustments
- *Low risk* of hypoglycemia
- ADRs: Edema, weight gain
- **Black Box Warning:** CHF
Decreasing Frequency

Recommended Once Daily Regimens

- **Metformin ER**
  - Only available in 500 mg and 750 mg

- **SGLT2 Inhibitors**
  - Empagliflozin (Jardiance), canagliflozin (Invokana), dapagliflozin (Farxiga)

- **GLP-1 Agonists (injectable)**
  - *Once weekly*: Semaglutide (Ozempic), dulaglutide (Trulicity), exenatide (Bydureon [BCISE])
  - *Once daily*: liraglutide (Victoza)

- **DPP-4 Inhibitors**
  - Linagliptin (Tradjenta), sitagliptin (Januvia)
  - Alogliptin (Nesina) and saxagliptin (Onglyza) = CHF warning
Decreasing Frequency

Once Daily Combos

**SGLT2-metformin ER**
- Synjardy XR (empagliflozin-metformin ER)
- Invokamet XR (canagliflozin-metformin ER)
- Xigduo XR (dapagliflozin-metformin ER)

**DPP4-metformin ER**
- Janumet XR (sitagliptin-metformin ER)
Decreasing Frequency

**Second-line Once Daily Regimens**

**Sulfonylureas**
- Glipizide XL

**Thiazolodinedione**
- Pioglitazone (Actos)
## Summary

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>A1c Benefit</th>
<th>Clinical Benefits</th>
<th>Risk of hypoglycemia</th>
<th>Weight Change</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metformin</strong></td>
<td>High (&gt;1–2%)</td>
<td>CV benefit</td>
<td>None</td>
<td>Neutral</td>
<td>Diarrhea/GI upset&lt;br&gt;• ER formulation: less ADRs&lt;br&gt;Vitamin B12 deficiency</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SGLT2 Inhibitors</strong></td>
<td>Intermediate (&gt;0.5–1%)</td>
<td>CV benefit&lt;br&gt;CKD benefit&lt;br&gt;CHF benefit</td>
<td>None</td>
<td>Loss</td>
<td>Risk for UTI (♀: ~18%; ♂: ~4%)&lt;br&gt;Genitourinary fungal infection (~5%)&lt;br&gt;Canagliflozin <strong>BBW</strong>: amputations</td>
</tr>
<tr>
<td><strong>GLP-1 Agonists</strong></td>
<td>High (&gt;1–2%)</td>
<td>CV benefit&lt;br&gt;CKD benefit</td>
<td>None</td>
<td>Loss</td>
<td>Nausea (16-20%), diarrhea, abdominal pain, constipation&lt;br&gt;<strong>BBW</strong>: Risk of Thyroid C-cell tumors (only seen in rats/mice)</td>
</tr>
<tr>
<td><strong>DPP-4 Inhibitors</strong></td>
<td>Intermediate (&gt;0.5–1%)</td>
<td>None</td>
<td>None</td>
<td>Neutral</td>
<td>Nasopharyngitis (5%)&lt;br&gt;<strong>Alogliptin/Saxagliptin</strong>: CHF warning</td>
</tr>
<tr>
<td><strong>Sulfonylureas</strong></td>
<td>High (&gt;1–2%)</td>
<td>None</td>
<td>Yes</td>
<td>Gain</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td><strong>Thiazolidinediones</strong></td>
<td>High (&gt;1–2%)</td>
<td>None</td>
<td>None</td>
<td>Gain</td>
<td>Edema&lt;br&gt;<strong>BBW</strong>: Congestive Heart Failure</td>
</tr>
</tbody>
</table>
Injectable Therapy
If HbA₁c above target despite dual/triple therapy

Consider initial injectable combination (i.e., GLP-1 RA + basal insulin or prandial/basal insulin) if HbA₁c >86 mmol/mol (10%) and/or >23 mmol/mol (2%) above target.

Consider GLP-1 RA in most prior to insulin

Consider insulin as first injectable if
- HbA₁c very high >97 mmol/mol (11%)
- Symptoms or evidence of catabolism: weight loss, polyuria, polydipsia which suggest insulin deficiency
- If type 1 diabetes is a possibility

If already on GLP-1 RA or if GLP-1 RA not appropriate OR Insulin preferred

If above HbA₁c target

Add basal Insulin

For patient on GLP-1 RA and basal Insulin
Consider FRC of GLP-1 RA and insulin (IDegLira or iGlarLixi) But note max dose of insulin in the FRCs

INITIATION FOR GLP-1 RA
- Initiate starting dose (varies across class)

TITRATION FOR GLP-1 RA
- Gradual titration to maintenance dose (varies across class)

INITIATION FOR BASAL
- Start 10 IU a day OR 0.1-0.2 IU/kg a day

TITRATION FOR BASAL
- Patient self titration is more effective
- Set FPG target that correlates to HbA₁c target
- Choose evidence-based titration
Insulin Overview

Traditional U100 insulins

Concentrated Insulin (U300)

Toujeo (insulin glargine 300 units/mL)

- Longer duration of action (up to 32-36 hours)
- 21% reduction in relative risk of confirmed/severe hypoglycemia compared with U100 glargine.

- Tillner JA, Bergmann K, Teichert L, et al. Euglycemic clamp profile of new insulin glargine U300 formulation in patients with type 1 diabetes (T1DM) is different from glargine U100. Diabetes 2013;62:A234
- Yki-Järvinen H, Bergenstal R, Ziemen M et al. New Insulin Glargine 300 Units/mL Versus Glargine 100 Units/mL in People With Type 2 Diabetes Using Oral Agents and Basal Insulin: Glucose Control and Hypoglycemia in a 6-Month Randomized Controlled Trial (EDITION 2). Diabetes Care. 2014;37(12):3235-3243.
ULTRA-long acting insulin

Tresiba (insulin degludec U200 and U100)

- LONGEST duration of action (up to 42 hours)

Insulin Storage

Room Temperature (59°-86°F)

Most insulin formulations last **28 days** at RT!

- Toujeo (insulin glargine U300) = **42 days**
- Tresiba (insulin degludec U100 and U200) = **56 days**
Self-Monitoring of BG

Non-adherence to Checking Sugars

• Prescribe medications that have low risk of hypos
• AVOID prescribe fast-acting/meal-time insulin
• Consider prescribing basal insulin to be given in the morning
• If sulfonylurea required, prescribe glipizide XL (assuming they eat at least once/day)

• Baby steps! Focus on once/day and slowly increase frequency.
Freestyle Libre

Continuous Glucose Monitoring (CGM)

• Sensors last 14 days
• Clinically shown to reduce hypoglycemia
Freestyle Libre

Medicare Coverage Criteria

Therapeutic CGMs and related supplies are covered by Medicare when all the following coverage criteria are met:

• The beneficiary has diabetes mellitus; and
• The beneficiary has been using a blood glucose monitor (BGM) and performing frequent (4 or more times a day) testing; and
• The beneficiary is insulin-treated with multiple (3 or more) daily injections of insulin or a Medicare covered continuous subcutaneous insulin infusion (CSII) pump; and
  - The beneficiary’s insulin treatment regimen requires frequent adjustment by the beneficiary on the basis of BGM or CGM testing results; and
  - Within six (6) months prior to ordering the CGM, the treating practitioner has an in-person visit with the beneficiary to evaluate their diabetes control and determined that criteria (1-4) above are met; and
  - Every six (6) months following the initial prescription of the CGM, the treating practitioner has an in-person visit with the beneficiary to assess adherence to their CGM regimen and diabetes treatment plan.
Breakout 2: Shared Learning

Some of the questions you posed include:

• How are other HCH programs are improving the management of A1C's > 9?
• Which treatment regimens are least likely to cause hypoglycemia?
• What are the options for simple, effective medication regimens?
• What resources are available to get free or reduced cost medications?
• What are the best practices for medication management?
• What emergency symptoms should we watch for?
• What are the benefits of 70/30 mix insulin vs rapid acting meal based insulin?
• How to more safely provide hypoglycemics in those without regular access to food or bathrooms?
• Which diabetes medications don’t require refrigeration?
Session 3
FACING THE CHALLENGES
Food Insecurity and Healthy Food

• Direct correlation between housing instability and food insecurity; and the association of type 2 diabetes
• Obesity with food insecurity has been well documented.
• Many health centers use the Hunger Vital Sign, a standardized two-question screener, to assess for food security.
  • The Feeding America toolkit is also very helpful with this process.
• Important for patients to be assessed regarding their eligibility for food stamps or Supplement Nutrition Assistance Program (SNAP).
Mental Illness, Substance Use Disorders

• Higher prevalence of diabetes, but fewer recommended laboratory tests for diabetes monitoring and screenings for complications.

• Higher risk of hospitalization for diabetes complications and experience not only a higher diabetes mortality rate but also a higher all-cause mortality rate.

• Patients with severe depression may be less likely to adhere to medication and dietary treatment regimens.

• People experiencing homelessness with mental illness are especially prone to having low levels of food security.

• Ongoing substance abuse presents for a very high risk for poor wound attention, progression of infection and the inability to self-refer for care if the wound worsens.

• Symptoms of mental illness (e.g. paranoia, apathy, delusion) can be barriers to self-care and the ability to self-refer for care.
Engaging and Establishing Relationships

• Practice cultural humility that includes having self-awareness and a respectful attitude toward the patient’s point of view.

• Provide culturally appropriate education and involve the patient in the learning process.

• Assess the patient’s basic literacy knowledge, numeracy and health literacy and provide self-management education accordingly.
The Sociobiological Cycle of Diabetes

- Social determinants of health
- Poverty
- Chronic stress
- Material deprivation
- Biological and Psychological responses
- Diabetes
- Lifestyle factors
- Managed condition

Need expanded social interventions to focus here.

Current interventions typically focus here.
Patient Education and Self-Management

• Specifically ask the patient about their understanding of diabetes and what they feel is the best way to manage their condition. This may provide an opportunity to address possible misconceptions that might otherwise be unrecognized.

• Assess the patient for tobacco, alcohol or illicit drug use and their readiness for change. This will give the provider an idea if the patient is or is not ready or able to abstain from these substances.

• Use motivational interviewing to assist the patient to move in the direction of contemplating change. This may be the first step in helping the patient reach a goal.
Breakout 3: Shared Learning

Some of the questions you posed include:

• What are healthy eating options for those with food insecurity?
• How can we provide medication to clients who can’t keep appointments?
• How can we help better coordinate meals and medications?
• How can we help manage diabetes when substance use and mental illness may be barriers to disease management?
A CLIENT STORY
Dedra (DeeDee) Blanchard,
STORIES FROM THE FIELD

Best Practices and Creative Resources
What can you share from your experience?
One take-away...

Did you get your questions answered?
• Proper management of diabetes
• Creative approaches to address the needs of diabetic clients experiencing homelessness
• Avoidance of hypoglycemia
• Prevalence of DM among homeless population; A1C goals
• Strategies to improve QI measure related to A1C's > 9
• Widely available community resources
• Approaches to encourage client engagement and agency
• Developing follow up plans for clients
• Communicating the severity of the disease to create buy-in for self-care
• Controlling DM and preventing complications like gangrene and amputations.
Patient Cases
Patient #1: 62 year-old homeless male

• PMH DM2 (A1c 11.8%), recently admitted for a burn due to severe neuropathy impairing his sense of touch and motor skills. Because his sugars were relatively well-controlled on an insulin during his admission, the team discharged the patient on a similar basal-bolus insulin regimen.

• Discharged on:
  • Insulin NPH 13 units twice daily
  • Insulin lispro 5/6/8 units with a +1:50>150 sliding scale.

• Physically unable to check sugars or inject insulin.
Patient #1: 62 year-old homeless male

Interventions:

• Discontinued ALL insulin

• Started on Synjardy XR and Januvia once daily

• Pill box provided, worked with patient until he could fill it independently.

• Patient developed nasopharyngitis, so Januvia d/c’d and switched to glipizide XL 5 mg daily.

• A1c 11.8% -> 6.4%
Patient #2: 65 year-old homeless male

• PMH DM2 (A1c >20%, improved to 16.2%), CHF, admitted for hypertensive urgency and discharged to respite on Lantus 60 units QHS, Humalog 15 units TID ac meals with sliding scale, glipizide 10 mg twice daily and metformin 1000 mg twice daily.

• BGs labile, reports frequent hypoglycemia with BG falling to the 50s 4-5 times/week. Skips meals frequently.
Patient #2: 65 year-old homeless male

Initial plan:
• Discontinue prandial insulin and glipizide
• Decrease Lantus to 30 units once daily
• Start Trulicity 0.75 mg qweek
• Start Synjardy XR (empagliflozin-metformin ER) 5-1000 mg 2 tabs daily in place of metformin
Patient #2: 65 year-old homeless male

• One week later: Patient began to experience worsening N/V/D (etiology unclear, could be GLP-1 vs. food poisoning), eating only 0.5-1 meals per day with poor appetite. Meanwhile, continued to get hypoglycemia with BG dropping to 60s 1-2x/week, BG 220s in-clinic.

• What should we do?
Patient #2: 65 year-old homeless male

• One week later: Patient began to experience worsening N/V/D (etiology unclear, could be GLP-1 vs. food poisoning), eating only 0.5-1 meals per day with poor appetite. Meanwhile, continued to get hypoglycemia with BG dropping to 60s 1-2x/week, BG 220s in-clinic.

• What should we do?

Plan:
• Hold Lantus while NPO, inject 15 units if BG >200
• Continue Trulicity 0.75 mg qweek
• Increase Synjardy XR to 12.5-1000 mg 2 tabs daily
Patient #2: 65 year-old homeless male

• One week later: Pt’s N/V/D have resolved, now eating regularly again. Fasting BG 146 in-clinic, but reports one episode of hypoglycemia after skipping breakfast over the weekend. Endorses adherence to his regimen:
  • Self-increased Lantus back up to 30 units daily
  • Trulicity 0.75 mg qweek
  • Synjardy XR 12.5-1000 mg 2 tabs daily

• Is it possible to get the patient off of insulin?
Patient #2: 65 year-old homeless male

• Discontinue Lantus 30 units qAM
• Increase Trulicity to 0.75 mg -> 1.5 mg qweek
• Continue Synjardy XR 12.5-1000 mg 2 tabs daily
• Start glipizide XL 5 mg once daily

• A1c 16.2% -> 8.1%
• What else can we do to improve glycemic control further?
Patient #3: 33 year-old homeless male

- PMH DM2 (A1c 15.7%) with EtOH dependence, depression, schizoaffective disorder, and gastroparesis s/p multiple hospitalizations for DKA. Discharged from custody on Lantus 50 units qAM and 35 qPM. Has failed metformin (diarrhea), non-adherent to all pills.
- BG extremely labile, frequent hypoglycemic episodes (BG 50-60s).
- Living on the street, lost his insulin and pen needles a few days ago. Food insecure. Presents to clinic with BG 511.
- C-Peptide: **0.25** (0.80 – 3.85 ng/mL)
- **Thoughts/Ideas?**