AACE Type 2 Diabetes Management Guidelines 2018
Lifestyle Therapy

RISK STRATIFICATION FOR DIABETES COMPLICATIONS

INTENSITY STRATIFIED BY BURDEN OF OBESITY AND RELATED COMPLICATIONS

**Nutrition**
- Maintain optimal weight
- Calorie restriction (if BMI is increased)
- Plant-based diet; high polyunsaturated and monounsaturated fatty acids
- Avoid *trans* fatty acids; limit saturated fatty acids
- Structured counseling
- Meal replacement

**Physical Activity**
- 150 min/week moderate exertion (e.g., walking, stair climbing)
- Strength training
- Increase as tolerated
- Structured program
- Wearable technologies
- Medical evaluation/clearance
- Medical supervision

**Sleep**
- About 7 hours per night
- Basic sleep hygiene
- Screen OSA
- Home sleep study
- Referral to sleep lab

**Behavioral Support**
- Community engagement
- Alcohol moderation
- Discuss mood with HCP
- Formal behavioral therapy

**Smoking Cessation**
- No tobacco products
- Nicotine replacement therapy
- Referral to structured program
Complications-Centric Model for Care of the Patient with Overweight/Obesity

**STEP 1**

**EVALUATION FOR COMPLICATIONS AND STAGING**

<table>
<thead>
<tr>
<th>CARDIOMETABOLIC DISEASE</th>
<th>BIOMECHANICAL COMPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI &lt; 25</td>
<td></td>
</tr>
<tr>
<td>NO COMPLICATIONS</td>
<td></td>
</tr>
<tr>
<td>NO OVERWEIGHT OR OBESITY</td>
<td></td>
</tr>
<tr>
<td>BMI ≥ 25</td>
<td></td>
</tr>
<tr>
<td>OVERWEIGHT OR OBESITY</td>
<td></td>
</tr>
<tr>
<td><strong>STAGE 0</strong></td>
<td></td>
</tr>
<tr>
<td><strong>STAGE 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>STAGE 2</strong></td>
<td></td>
</tr>
<tr>
<td>COMPLICATIONS</td>
<td></td>
</tr>
<tr>
<td>BMI ≥ 25</td>
<td></td>
</tr>
<tr>
<td>MILD TO MODERATE</td>
<td></td>
</tr>
<tr>
<td>SEVERE</td>
<td></td>
</tr>
</tbody>
</table>

**STEP 2**

**SELECT:**

- Therapeutic targets for improvement in complications
- Treatment modality
- Treatment intensity based on staging

**Lifestyle Therapy:**

- Physician/RD counseling, web/remote program, structured multidisciplinary program

**Medical Therapy (BMI ≥ 27):**

- Individualize care by selecting one of the following based on efficacy, safety, and patients’ clinical profile: phentermine, orlistat, lorcaserin, phentermine/topiramate ER, naltrexone/bupropion, liraglutide 3 mg

**Surgical Therapy (BMI ≥ 35):**

- Gastric banding, sleeve, or bypass

**STEP 3**

If therapeutic targets for complications not met, intensify lifestyle, medical, and/or surgical treatment modalities for greater weight loss. Obesity is a chronic progressive disease and requires commitment to long-term therapy and follow-up.
## ASCVD Risk Factor Modifications Algorithm

### Dyslipidemia

**Lifestyle Therapy** (Including Medically Assisted Weight Loss)

**Lipid Panel:** Assess ASCVD Risk

**Statin Therapy**
If TG > 500 mg/dL, fibrates, Rx-grade omega-3 fatty acids, niacin

If statin-intolerant

Try alternate statin, lower statin dose or frequency, or add nonstatin LDL-C lowering therapies

Repeat lipid panel; assess adequacy, tolerance of therapy

Intensify therapies to attain goals according to risk levels

**Risk Levels**

<table>
<thead>
<tr>
<th>Risk Levels</th>
<th>High</th>
<th>Very High</th>
<th>Extreme</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL-C (mg/dL)</td>
<td>&lt;100</td>
<td>&lt;70</td>
<td>&lt;55</td>
</tr>
<tr>
<td>Non-HDL-C (mg/dL)</td>
<td>&lt;130</td>
<td>&lt;100</td>
<td>&lt;80</td>
</tr>
<tr>
<td>TG (mg/dL)</td>
<td>&lt;150</td>
<td>&lt;150</td>
<td>&lt;150</td>
</tr>
<tr>
<td>Apo B (mg/dL)</td>
<td>&lt;90</td>
<td>&lt;80</td>
<td>&lt;70</td>
</tr>
</tbody>
</table>

**If not at desirable levels:**

Intensify lifestyle therapy (weight loss, physical activity, dietary changes) and glycemic control; consider additional therapy

**To lower LDL-C:**
- Intensify statin, add ezetimibe, PCSK9i, coleselvelam, or niacin
- Intensify statin and/or add Rx-grade OM3 fatty acid, fibrate, and/or niacin
- Intensify statin and/or add ezetimibe, PCSK9i, coleselvelam, and/or niacin
- Statin + PCSK9i

**To lower Non-HDL-C, TG:**

**To lower Apo B, LDL-P:**

**To lower LDL-C in FH:**

Assess adequacy & tolerance of therapy with focused laboratory evaluations and patient follow-up

---

### Hypertension

**Goal:** Systolic <130, Diastolic <80 mm Hg

**ACEi or ARB**

**For initial blood pressure >150/100 mm Hg:**

**Dual Therapy**

ACEi + ARB

Calcium Channel Blocker

β-blocker

Thiazide

If not at goal (2-3 months)

Add calcium channel blocker, β-blocker or thiazide diuretic

If not at goal (2-3 months)

Add next agent from the above group, repeat

If not at goal (2-3 months)

Additional choices (α-blockers, central agents, vasodilators, aldosterone antagonist)

Achievement of target blood pressure is critical

* EVEN MORE INTENSIVE THERAPY MIGHT BE WARRANTED ** FAMILIAL HYPERCHOLESTEROLEMIA

COPYRIGHT © 2018 AACE MAY NOT BE REPRODUCED IN ANY FORM WITHOUT EXPRESS WRITTEN PERMISSION FROM AACE. DOI 10.4158/CS-2017-0153
Glycemic Control Algorithm

**INDIVIDUALIZE GOALS**

- **A1C ≤ 6.5%** For patients without concurrent serious illness and at low hypoglycemic risk
- **A1C > 6.5%** For patients with concurrent serious illness and at risk for hypoglycemia

**LIFESTYLE THERAPY** (Including Medically Assisted Weight Loss)

- **Entry A1C < 7.5%**
  - **MONOTHERAPY**:
    - Metformin
    - GLP-1 RA
    - SGLT-2i
    - DPP-4i
    - TZD
    - AGi
    - SU/GLN
  - **DUAL THERAPY**:
    - GLP-1 RA
    - SGLT-2i
    - DPP-4i
    - TZD
    - Basal Insulin
    - Colesevelam
    - Bromocriptine QR
    - AGi
    - SU/GLN
  - If not at goal in 3 months proceed to Dual Therapy

- **Entry A1C ≥ 7.5%**
  - **DUAL THERAPY**:
    - GLP-1 RA
    - SGLT-2i
    - DPP-4i
    - TZD
    - Basal Insulin
    - Colesevelam
    - Bromocriptine QR
    - AGi
    - SU/GLN
  - MET or other 1st-line agent + 2nd-line agent
  - If not at goal in 3 months proceed to or intensify insulin therapy

- **Entry A1C > 9.0%**
  - **TRIPLE THERAPY**:
    - GLP-1 RA
    - SGLT-2i
    - DPP-4i
    - TZD
    - Basal Insulin
    - Colesevelam
    - Bromocriptine QR
    - AGi
    - SU/GLN
  - MET or other 1st-line agent + 2nd-line agent + 3rd-line agent
  - If not at goal in 3 months proceed to or intensify insulin therapy

**SYMPTOMS**

- **NO**
  - DUAL Therapy
- **YES**
  - INSULIN + Other Agents
  - OR
  - TRIPLE Therapy
  - ADD OR INTENSIFY INSULIN
    - Refer to Insulin Algorithm

**LEGEND**

- ✔ Few adverse events and/or possible benefits
- ! Use with caution

* Order of medications represents a suggested hierarchy of usage; length of line reflects strength of recommendation

**PROGRESSION OF DISEASE**

COPYRIGHT © 2018 AACE MAY NOT BE REPRODUCED IN ANY FORM WITHOUT EXPRESS WRITTEN PERMISSION FROM AACE. DOI 10.4158/CS-2017-0153
Algorithm for Adding/Intensifying Insulin

**START BASAL** (Long-Acting Insulin)

- **A1C < 8%**
  - TDD 0.1–0.2 U/kg
- **A1C > 8%**
  - TDD 0.2–0.3 U/kg

**Insulin titration every 2–3 days to reach glycemic goal:**
- Fixed regimen: Increase TDD by 2 U
- Adjustable regimen:
  - FBG > 180 mg/dL: add 20% of TDD
  - FBG 140–180 mg/dL: add 10% of TDD
  - FBG 110–139 mg/dL: add 1 unit
  - If hypoglycemia, reduce TDD by:
    - BG < 70 mg/dL: 10% – 20%
    - BG < 40 mg/dL: 20% – 40%

**Consider discontinuing or reducing sulfonylurea after starting basal insulin (basal analogs preferred to NPH)**

**Glycemic Goal:**
- <7% for most patients with T2D; fasting and premeal BG < 110 mg/dL; absence of hypoglycemia
- A1C and FBG targets may be adjusted based on patient’s age, duration of diabetes, presence of comorbidities, diabetic complications, and hypoglycemia risk

**INTENSIFY** (Prandial Control)

- **Add GLP-1 RA**
  - Or SGLT-2i
  - Or DPP-4i
- **Add Prandial Insulin**

**Basal Plus 1, Plus 2, Plus 3**
- Begin prandial insulin before largest meal
- If not at goal, progress to injections before 2 or 3 meals
- Start: 10% of basal dose or 5 units

**Basal Bolus**
- Begin prandial insulin before each meal
- 50% Basal / 50% Prandial TDD 0.3–0.5 U/kg
- Start: 50% of TDD in three doses before meals

**Insulin titration every 2–3 days to reach glycemic goal:**
- Increase prandial dose by 10% or 1-2 units if 2-h postprandial or next premeal glucose consistently > 140 mg/dL
- If hypoglycemia, reduce TDD basal and/or prandial insulin by:
  - BG consistently < 70 mg/dL: 10% – 20%
  - Severe hypoglycemia (requiring assistance from another person) or BG < 40 mg/dL: 20% – 40%

*Glycemic Control Not at Goal*

**COPYRIGHT © 2018 AACE. MAY NOT BE REPRODUCED IN ANY FORM WITHOUT EXPRESS WRITTEN PERMISSION FROM AACE. DOI 10.4158/CS-2017-0153**
# Profiles of Antidiabetic Medications

<table>
<thead>
<tr>
<th></th>
<th>MET</th>
<th>GLP-1 RA</th>
<th>SGLT-2i</th>
<th>DPP-4i</th>
<th>AGi</th>
<th>TZD (moderate dose)</th>
<th>SU</th>
<th>COLSVL</th>
<th>BCR-QR</th>
<th>INSULIN</th>
<th>PRAML</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HYPO</strong></td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate/Severe</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate to Severe</td>
<td>Neutral</td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
<td>Slight Loss</td>
<td>Loss</td>
<td>Loss</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Gain</td>
<td>Gain</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Gain</td>
</tr>
<tr>
<td><strong>RENA L / GU</strong></td>
<td>Contra-indicated if eGFR &lt; 30 mL/min/1.73 m²</td>
<td>Exenatide Not Indicated CrCl &lt; 30</td>
<td>Not Indicated for eGFR &lt; 45 mL/min/1.73 m²</td>
<td>Genital Mycotic Infections</td>
<td>Dose Adjustment Necessary (Except Linagliptin)</td>
<td>Effective in Reducing Albuminuria</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>More Hypo Risk</td>
</tr>
<tr>
<td><strong>GI Sx</strong></td>
<td>Moderate</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Mild</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>CHF</strong></td>
<td>Neutral</td>
<td>See #1</td>
<td>See #2</td>
<td>See #3</td>
<td>Neutral</td>
<td>Moderate</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>CHF Risk</td>
</tr>
<tr>
<td><strong>CARDIAC</strong></td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Mild Fracture Risk</td>
<td>Neutral</td>
<td>Moderate Fracture Risk</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
<tr>
<td><strong>ASCVD</strong></td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>DKA Can Occur in Various Stress Settings</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><strong>BONE</strong></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>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

- Few adverse events or possible benefits
- Likelihood of adverse effects
- Use with caution

1. Liraglutide—FDA approved for prevention of MACE events.
2. Empagliflozin—FDA approved to reduce CV mortality. Canagliflozin shown to reduce MACE events.
3. Possible increased hospitalizations for heart failure with alogliptin and saxagliptin.
For any scientific queries on above topic

Write to the Scientific Department at:

+91 8879607724  scientific@aristopharma.org