Diabetes Treatment Guidelines


Criteria for Diagnosis of Diabetes

<table>
<thead>
<tr>
<th>Diagnostic Tool</th>
<th>Value Associated with Diagnosis of Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Plasma Glucose (FPG)*</td>
<td>≥ 126 mg/dL</td>
</tr>
<tr>
<td></td>
<td>• In absence of unequivocal hyperglycemia, this number must be confirmed by repeat testing.</td>
</tr>
<tr>
<td>Random Plasma Glucose</td>
<td>≥ 200 mg/dL with symptoms (Polyuria; Polydipsia; Unexplained weight loss)</td>
</tr>
<tr>
<td></td>
<td>• Value measured without regard to last meal</td>
</tr>
<tr>
<td></td>
<td>• Only diagnostic with classic symptoms of hyperglycemia or hyperglycemic crisis</td>
</tr>
<tr>
<td>Oral Glucose Tolerance Test</td>
<td>≥ 200 mg/dL 2 hours post 75 g glucose challenge</td>
</tr>
<tr>
<td></td>
<td>• In absence of unequivocal hyperglycemia, this number must be confirmed by repeat testing.</td>
</tr>
<tr>
<td>Hemoglobin A1c</td>
<td>≥ 6.5%</td>
</tr>
<tr>
<td></td>
<td>• Performed in a laboratory using a method that is NGSP certified* and standardized to the DCCT assay**</td>
</tr>
</tbody>
</table>

# = Fasting is defined as no caloric intake for at least 8 hours.
* National Glycohemoglobin Standardization Program; ** Diabetes Control and Complications Trial

Practitioner may select one diagnostic tool above and in absence of unequivocal hyperglycemia should confirm results with repeat testing.

Criteria Associated with Increased Risk for Diabetes

<table>
<thead>
<tr>
<th>Diagnostic Tool</th>
<th>Value Associated with Diagnosis of Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impaired Fasting Glucose*</td>
<td>100 to 125 mg/dL</td>
</tr>
<tr>
<td>Impaired Glucose Tolerance</td>
<td>140 to 199 mg/dL</td>
</tr>
<tr>
<td></td>
<td>• 2 hours post 75 g glucose challenge</td>
</tr>
<tr>
<td>Hemoglobin A1c</td>
<td>Range of 5.7% to 6.4%</td>
</tr>
</tbody>
</table>

# = Fasting is defined as no caloric intake for at least 8 hours.

Asymptomatic patients with increased risk of diabetes who should be considered for further testing: adults of any age who are overweight or obese (BMI ≥ 25 kg/m² or BMI ≥ 23 kg/m² for Asian Americans) and who have one or more additional risk factors such as age ≥ 45. For all patients, testing should be initiated at age 45 and offered at 3-year intervals.

Updated by Jeanine P. Abrons, Elisha Andreas, and Molly Polzin
## Associated Goals for Adults with Diabetes

<table>
<thead>
<tr>
<th>Associated Goal</th>
<th>Value of Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Glycemic Control (A1c)</strong></td>
<td>ADA*: &lt; 7%&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>AACE**: &lt; 6.5%&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Pre-Prandial Capillary Plasma Glucose</strong></td>
<td>ADA: 80 to 130 mg/dL&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>AACE: &lt; 110 mg/dL</td>
</tr>
<tr>
<td><strong>Post-Prandial Capillary Plasma Glucose</strong></td>
<td>ADA: &lt; 180 mg/dL&lt;sup&gt;a,c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>AACE: &lt; 140 mg/dL</td>
</tr>
<tr>
<td><strong>Blood Pressure (Systolic)</strong></td>
<td>ADA: &lt; 140 mmHg&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>AACE: &lt; 130 mmHg</td>
</tr>
<tr>
<td><strong>Blood Pressure (Diastolic)</strong></td>
<td>ADA: &lt; 90 mmHg</td>
</tr>
<tr>
<td></td>
<td>AACE: &lt; 80 mmHg</td>
</tr>
</tbody>
</table>

<sup>*American Diabetes Association (ADA) Standards of Medical Care 2018; **American Association of Clinical Endocrinologists and American College of Endocrinology Comprehensive Type 2 Diabetes Management Algorithm 2018</sup>

a: More or less stringent glycemic goals may be appropriate for individual patients. Goals should be based on duration of diagnosis, age/life expectancy, comorbid conditions (e.g., known cardiovascular disease or advanced microvascular complications), hypoglycemia unawareness, and other considerations.

b: For patients without concurrent serious illness and at low hypoglycemic risk; level ≥ 6.5% for patients with concurrent illness and at risk for hypoglycemia. A1c targets must be individualized.

c: Post-prandial glucose may be targeted if A1c goals are not met despite reaching pre-prandial glucose goals. Measurements should be made 1-2 hours after the beginning of a meal; generally represents peak levels.

d: Lower systolic goals (e.g., < 130 mmHg) may be considered for certain individuals such as younger patients, those with albuminuria, and/or those with hypertension and one or more atherosclerotic cardiovascular disease risk factors if safe and tolerable for the patient.

e: Less stringent goals may be considered for frail patients with complicated comorbidities or those who have adverse medication effects. More intensive goal (e.g., < 120/80 mmHg) should be considered for patients if this goal can be safely reached without adverse medication-related effects.

Updated by Jeanine P. Abrons, Molly Polzin and Elisha Andreas
## Insulin and Insulin Analogues

<table>
<thead>
<tr>
<th>Type</th>
<th>Generic Name (Trade Name)</th>
<th>Onset (hours)</th>
<th>Peak (hours)</th>
<th>Duration (hours)</th>
<th>Administration Route</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rapid Acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analogue</td>
<td>Aspart (Novolog®)</td>
<td>0.2 to 0.3</td>
<td>1 to 3</td>
<td>3 to ≤ 5</td>
<td>Subcutaneous (SC) [Injection/CSII]</td>
</tr>
<tr>
<td></td>
<td>Glulisine (Apidra®)</td>
<td>0.2 to 0.5</td>
<td>1.6 to 2.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lispro (Humalog®)</td>
<td>&lt; 0.25</td>
<td>0.5 to 2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Short Acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human</td>
<td>Regular (Humulin R®; Novolin®)</td>
<td>0.5</td>
<td>2.5 to 5</td>
<td>4 to 12</td>
<td>Daily Maintenance Use: SC [Injection/CSII]; Continuous infusion may be used in other instances</td>
</tr>
<tr>
<td></td>
<td>Regular U500 (Concentrated)</td>
<td></td>
<td></td>
<td>Up to 24</td>
<td>(SC) [Injection/CSII]</td>
</tr>
<tr>
<td><strong>Intermediate Acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human</td>
<td>NPH (Humulin-N®; Novolin-N®)</td>
<td>1 to 2</td>
<td>9 to 12</td>
<td>14 to 24</td>
<td>SC</td>
</tr>
<tr>
<td><strong>Long Acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analogue; Human</td>
<td>Degludec (Tresiba®)</td>
<td>~ 1</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>SC</td>
</tr>
<tr>
<td></td>
<td>Detemir (Levemir®)</td>
<td>3 to 4</td>
<td>3 to 9</td>
<td>6 to 23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glargine (Lantus®)</td>
<td></td>
<td>Not applicable</td>
<td>10.8 to &gt; 24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glargine (Basaglar®)</td>
<td></td>
<td></td>
<td>≥ 24</td>
<td></td>
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<tr>
<td></td>
<td>Glargine (Toujeo®)</td>
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<tr>
<td><strong>Insulin Combinations</strong></td>
<td></td>
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</tr>
<tr>
<td>Combination</td>
<td>Degludec + Aspart (Ryzodeg® 70/30)</td>
<td>0.23</td>
<td>Not applicable</td>
<td>&gt; 24</td>
<td>SC</td>
</tr>
<tr>
<td></td>
<td>NPH + Regular (Humulin® 70/30; Novolin® 70/30)</td>
<td>0.5</td>
<td>2 to 12</td>
<td>18 to 24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lispro protamine + Lispro (Humalog® Mix 50/50; Humalog® Mix 75/25)</td>
<td>0.25 to 0.5</td>
<td>50/50 Mix: 0.8 to 48 75/25 Mix: 1 to 6.5</td>
<td>14 to 24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aspart protamine + Aspart (Novolog® Mix 70/30)</td>
<td>0.2 to 0.3</td>
<td>1 to 4</td>
<td>18 to 24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glargine + GLP-1 Agonist (Soliqua® 1000/33)</td>
<td>Not listed</td>
<td>2.5 to 3</td>
<td>T 1/2 = 3 h; Clearance = 35 L/h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Degludec + GLP-1 Agonist (Xultophy®)</td>
<td>Not applicable</td>
<td>&gt; 24 (see individual drugs)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*CSII = continuous subcutaneous insulin infusion*

*Updated by Jasmine Mangrum and Jeanine P. Abrons*
<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name / Brand Name</th>
<th>Monotherapy Hypoglycemia Y/N</th>
<th>Maximum Daily Dose</th>
<th>Usual Starting Dose</th>
<th>Notable Side Effects and Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Diabetes Medications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-Acting Secretagogues</td>
<td>Glimepiride (Amaryl®)</td>
<td>Y</td>
<td>8 mg</td>
<td>1 to 2 mg daily</td>
<td>Weight gain. Possible sun sensitivity. Not recommended in geriatric or those with renal insufficiencies. Active metabolites increase risk of prolonged hypoglycemia. Glyburide and micronized glyburide are not bio-equivalent; re-titrate if patient transferred between products. <strong>Dose adjustments should not be made more frequently than every 7 days.</strong> Possible avoidance of sustained-release formulations in renal impairment.</td>
</tr>
<tr>
<td></td>
<td>Glyburide (Diabeta®)**</td>
<td></td>
<td>12 mg</td>
<td>1.5 to 3 mg daily</td>
<td>Divide doses of ≥ 6 mg and take BID before meals.</td>
</tr>
<tr>
<td></td>
<td>Glipizide (Glucotrol®)</td>
<td></td>
<td>20 mg</td>
<td>2.5 to 5 mg daily</td>
<td>Divide doses &gt; 10 mg</td>
</tr>
<tr>
<td></td>
<td>Extended release glipizide (Glucotrol® XL)**</td>
<td></td>
<td>40 mg</td>
<td>5 mg</td>
<td>Divide doses &gt; 15 mg</td>
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</tr>
<tr>
<td>Drug Class</td>
<td>Generic Name / Brand Name</td>
<td>Usual Starting Dose</td>
<td>Maximum Daily Dose</td>
<td>Monotherapy Hypoglycemia Y/N</td>
<td>Notable Side Effects</td>
</tr>
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</tr>
<tr>
<td><strong>SHORT-ACTING SECRETAGOGUES</strong></td>
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<tr>
<td>Repaglinide (Prandin®)*</td>
<td></td>
<td>New to blood glucose lowering agents or A1c &lt; 8%: 0.5mg</td>
<td>16 mg (Maximum dose of 4 mg per meal)</td>
<td>Y</td>
<td>· Hypoglycemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prior treatment with blood glucose lowering agent or A1c ≥ 8%: 1 to 2 mg</td>
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</tr>
<tr>
<td>Nateglinide (Starlix®)</td>
<td>120 mg</td>
<td>360 mg</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 mg (in patients near A1c goal)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>α-GLUCOSIDASE INHIBITORS</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Acarbose (Precose®)</td>
<td>25 mg TID</td>
<td>100 mg TID</td>
<td></td>
<td>N</td>
<td>· Abdominal pain</td>
</tr>
<tr>
<td></td>
<td>&lt; 60 kg: 50 mg TID</td>
<td></td>
<td></td>
<td></td>
<td>· Flatulence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>· Diarrhea</td>
</tr>
<tr>
<td>Miglitol (Glyset®)</td>
<td>25 mg TID</td>
<td>100 mg TID</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Oral Diabetes Medications (continued)

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name / Brand Names</th>
<th>Usual Starting Dose</th>
<th>Maximum Daily Dose</th>
<th>Monotherapy Hypoglycemia Y/N</th>
<th>Notable Side Effects</th>
<th>Special Considerations/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DPP-4 INHIBITORS</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
| Alogliptin                  | (Nesina®)*                 | 25 mg Daily         | Generally not dosed over 25 mg Daily | N                             | · Usually well tolerated  
  · Headache  
  · GI upset  
  · Naso-pharyngitis  
  · Potential pancreatitis | *Renal impairment dose reduction required  
  · CrCl 30 to 60 mL/min: 12.5 mg Daily  
  · CrCl <30 mL/min: 6.25 mg Daily |
| Sitagliptin phosphate       | (Januvia®)**               | 100 mg Daily       | 100 mg Daily       |                              |                      | **Renal impairment dose reduction required  
  · CrCl ≤ 50 mL/min: 50 mg Daily  
  · CrCl < 30 mL/min: 25 mg Daily |
| Saxagliptin                 | (Onglyza®)***              | 2.5 mg or 5 mg Daily | 5 mg Daily         |                              |                      | ***Renal impairment dose reduction required  
  · CrCl ≤ 50 mL/min: 2.5 mg Daily  
  ***Limit dose to 2.5 mg when co-administered with a strong CYP450 3A4/5 inhibitor |
| Linagliptin                 | (Tradjenta®)               | 5 mg Daily          | 5 mg Daily         |                              |                      | none |
| **SODIUM GLUCOSE TRANSPORTER 2 INHIBITORS (SGLT2)** |                          |                     |                    |                              |                      |                                |
| Canagliflozin               | (Invokana®)*               | 100 mg Daily       | 300 mg Daily       | N                             | -Genitourinary infection  
  - Dehydration  
  - Renal failure  
  - Hypotension  
  - Increased serum K+  
  - Increased LDLs | *Renal impairment dose reduction required  
  · eGFR (estimated glomerular filtration rate): 45 to 60 mL/min: 100 mg Daily  
  · eGFR < 45 mL/min: Use not recommended |
| Dapagliflozin               | (Farxiga®)**               | 5 mg Daily          | 10 mg Daily        |                              |                      | **Renal impairment dose reduction required  
  · eGFR < 60 mL/min: Use not recommended  
  · eGFR < 30 mL/min: Contraindication |
| Empagliflozin               | (Jardiance®)***            | 10 mg Daily         | 25 mg Daily        |                              |                      | ***Renal impairment dose reduction required  
  · eGFR < 45 mL/min: Use not recommended  
  · eGFR < 30 mL/min: Contraindicated |
| **DOPAMINE AGONIST**        |                            |                     |                    |                              |                      |                                |
| Bromocriptine               | (Cycloset®)                | 0.8 mg Daily        | 4.8 mg Daily       | N                             | · Dizziness  
  · GI upset | · Increase by 0.8 mg weekly interval  
  · Take within 2 hours of waking in morning  
  · Take with food to lessen GI upset |
| **BILE ACID SEQUESTRANTS**  |                            |                     |                    |                              |                      |                                |
| Colesevelam                 | (Welchol®)                 | 3.75 g Daily or in divided doses of 1.875 g BID | 3.75 g Daily or in divided doses of 1.875 g BID | N                             | · Constipation  
  · Elevated triglycerides | · Not recommended with GI motility disorders  
  · May cause decreased absorption of certain medications  
  · Take with meals |
<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name/ Brand Name</th>
<th>Usual Starting Dose</th>
<th>Maximum Daily Dose</th>
<th>Monotherapy Hypoglycemia Y/N</th>
<th>Notable Side Effects</th>
<th>Special Considerations/Notes</th>
</tr>
</thead>
</table>
| **BIGUANIDES** | Metformin (Glucophage®)/ Metformin Oral Solution (Riomet®) | 500 mg BID to 850 mg Daily | 2,550 mg daily in 2 to 3 divided doses | N | • Black Box Warning: Lactic Acidosis | • Contraindicated in renal dysfunction  
• Females: Serum creatinine >1.4 mg/dL  
• Males: Serum creatinine >1.5 mg/dL  
• Use food to lessen GI side effects |
| | Metformin Extended Release (Fortamet®, Glumetza®, Glucophage XR®) | 500 mg to 750 mg Daily | 2,000 mg daily (*2500 mg daily) | | • Other Side Effects: GI effects | |
| **THIAZOLIDINEDIONS** | Pioglitazone HCl (Actos®)** | 15 mg Daily | 45 mg Daily | N | • **Black Box Warning: Heart Failure | • Contraindicated in New York Heart Association (NYHA) Class III/IV heart failure  
• Monitor liver function tests before and periodically with use  
• Safety program exists for Avandia |
| | Rosiglitazone Maleate (Avandia®)** | 4 mg Daily or Divided | 8 mg Daily, If Not On Insulin | | • ***Black Box Warning: Higher MI risk | |

Updated by Jasmine Mangrum and Jeanine P. Abrons
## Combination Oral Diabetes Medications

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name/Brand Name</th>
<th>Dosage Range</th>
<th>Common Side Effects</th>
<th>Special Considerations/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMBINATION OF CLASSES</strong></td>
<td></td>
<td></td>
<td>• Upper respiratory infection (URI)</td>
<td>• Dosed once daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Nasopharyngitis</td>
<td>• Fungal infection</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Headache</td>
<td>• Dosing based on if patient not controlled by diet/exercise alone, with a sulfonyurea &amp;/or metformin, &amp; fasting plasma glucose (FPG)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Hypoglycemia</td>
<td>• Start dose: no &gt; than current daily dose of components; ↑ every 2 weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Gastrointestinal (GI) symptoms</td>
<td>• Hypoglycemia &amp; GI are ↑ with higher initial doses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Risk of anemia in G6PD deficiency</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Given in divided doses or once daily</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Initial dose based on whether on metformin or not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Dosing based on New York Heart Association (NYHA) heart failure (HF) class, control on metformin or pioglitazone monotherapy adequacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Slowly ↑ based on weight gain, edema, signs/symptoms of HF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Metformin doses &gt; 3,000 mg tolerated better if divided 3 times daily</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Dose adjustment with strong CYP2C8 inhibitors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Lower extremity edema</td>
</tr>
<tr>
<td>Glipizide + Metformin (Metaglip®)</td>
<td>Glipizide 2.5 mg/Metformin 250 mg or 500 mg** to 10 mg/200 mg in divided doses</td>
<td></td>
<td>• Hypoglycemia &amp; GI are ↑ with higher initial doses</td>
<td>• Dose divided twice daily with meals.</td>
</tr>
<tr>
<td>Glyburide + Metformin (Glucovance®)</td>
<td>1.25 mg/250 mg Daily or Twice Daily** to 20 mg/2000 mg Daily With Meals</td>
<td></td>
<td>• Risk of anemia in G6PD deficiency</td>
<td>• Dosed once daily</td>
</tr>
<tr>
<td>Linagliptin + Metformin (Jentadueto®)</td>
<td>See Notes to 5 mg/2000 mg Daily</td>
<td></td>
<td>• Given in divided doses or once daily</td>
<td>• Fungal infection</td>
</tr>
<tr>
<td>Pioglitazone + Metformin (Actoplus Met®, Actoplus Met XR®)</td>
<td>Immediate Release (IR): Pioglitazone 15 mg/Metformin 500 to 850 mg** Daily or Twice Daily Extended Release (ER): Pioglitazone 15 to 30 mg/Metformin 1000 mg Daily or Twice Daily Max: Pioglitazone 45 mg/ Metformin 2000 mg Daily</td>
<td></td>
<td>• Dose based on New York Heart Association (NYHA) heart failure (HF) class, control on metformin or pioglitazone monotherapy adequacy</td>
<td>• Dosing based on New York Heart Association (NYHA) heart failure (HF) class, control on metformin or pioglitazone monotherapy adequacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Slowly ↑ based on weight gain, edema, signs/symptoms of HF</td>
<td>• Slowly ↑ based on weight gain, edema, signs/symptoms of HF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Metformin doses &gt; 3,000 mg tolerated better if divided 3 times daily</td>
<td>• Metformin doses &gt; 3,000 mg tolerated better if divided 3 times daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Dose adjustment with strong CYP2C8 inhibitors</td>
<td>• Dose adjustment with strong CYP2C8 inhibitors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Lower extremity edema</td>
<td>• Lower extremity edema</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Dose 2 to 3 times daily with meals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Dose based on dosing of individual drugs at start &amp; adequacy of control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Dose based on New York Heart Association (NYHA) heart failure (HF) class, control on metformin or pioglitazone monotherapy adequacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Dose based on New York Heart Association (NYHA) heart failure (HF) class, control on metformin or pioglitazone monotherapy adequacy &amp; should not be used with Insulin</td>
</tr>
<tr>
<td>Rosiglitazone + Metformin (Avandamet®)</td>
<td>See Notes to Rosiglitazone 8 mg/Metformin 2000 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Combination Oral Diabetes Medications (continued)

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name/Brand Name</th>
<th>Usual Dosage Range</th>
<th>Notable Side Effects</th>
<th>Special Considerations/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saxagliptin + Metformin (Kombiglyze XR®)</td>
<td>Use individual dose of agents to Max: 2.5 to 5 mg Saxagliptin/Metformin 1000 to 2000 mg Daily</td>
<td>• Headache • Diarrhea • Upper respiratory infection (URI) • Hypoglycemia • Nasopharyngitis</td>
<td>• Dose based on use of individual drugs, adequacy of control, or use with insulin • Dose adjustment based on use with strong CYP 3A4/5 medication</td>
<td></td>
</tr>
<tr>
<td>Sitagliptin + Metformin (Janumet®, Janumet XR®)</td>
<td>Starting doses based on prior use of individual drugs to Sitagliptin 100 mg/Metformin 2000 mg Daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rosiglitazone + Glimepiride (Avandaryl®)</td>
<td>Rosiglitazone 4 mg/Glimepiride 1 or 2 mg Daily to Rosiglitazone 8 mg/Glimepiride 4 mg Daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pioglitazone + Glimepiride (Duetact®)</td>
<td>Pioglitazone 30 mg/Glimepiride 2 or 4 mg to Pioglitazone 45 mg/Glimepiride 8 mg Daily</td>
<td></td>
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</tr>
<tr>
<td>Alogliptin + Pioglitazone (Oseni®)</td>
<td>See Notes to Alogliptin 25 mg/Pioglitazone 45 mg Daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sitagliptin + Simvastatin (Juvisync®)</td>
<td>Sitagliptin 100 mg/Simvastatin 40 mg**, Max: Dose of simvastatin maximum based on concurrent drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empagliflozin + Metformin (Synjardy®)</td>
<td>Individualized based on patients current regimen to Empagliflozin 25 mg/Metformin 2000 mg Daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empagliflozin + Linagliptin (Glyxambi®)</td>
<td>Empagliflozin 10 mg/Linagliptin 5 mg to Empagliflozin 25 mg/Linagliptin 5 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: ≥ = used for uncontrolled type 2 diabetes; * = Use alone or in combination; ** = Dose selection based upon additional criteria*
## Injectable Type 2 Diabetes Medications

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Generic Name/Brand Name</th>
<th>Usual Starting Dose</th>
<th>Maximum Daily Dose</th>
<th>Notable Side Effects</th>
<th>Special Considerations/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLP-1 AGONISTS</td>
<td>Exenatide (Byetta®)</td>
<td>5 mcg twice daily</td>
<td>10 mcg twice daily</td>
<td>• Headache • Hypoglycemia • Nausea • Diarrhea • Injection site reaction</td>
<td>• Administer 60 minutes prior to a meal • Subcutaneous administration • Box warning: risk of developing thyroid C-cell tumors</td>
</tr>
<tr>
<td></td>
<td>Exenatide Extended Release (Bydureon®)</td>
<td>2 mg once weekly</td>
<td>Not applicable</td>
<td>• Headache • Hypoglycemia • Nausea • Diarrhea • Injection site nodule</td>
<td>• Subcutaneous administration • Box warning: risk of developing thyroid C-cell tumors • Use right away after mixing • Take with or without food</td>
</tr>
<tr>
<td></td>
<td>Albiglutide (Tanzeum®)</td>
<td>30 mg once weekly</td>
<td>50 mg once weekly</td>
<td>• Hypoglycemia • Diarrhea • Injection site reactions</td>
<td>• Subcutaneous administration • Box warning: risk of developing thyroid C-cell tumors • Take with or without food</td>
</tr>
<tr>
<td></td>
<td>Dulaglutide (Trulicity®)</td>
<td>0.75 mg once weekly</td>
<td>1.5 mg once weekly</td>
<td>• Nausea • Diarrhea • Vomiting</td>
<td>• Subcutaneous administration • Box warning: risk of developing thyroid C-cell tumors • Take with or without food</td>
</tr>
<tr>
<td></td>
<td>Liraglutide (Victoza®)</td>
<td>See notes</td>
<td>1.8 mg once daily</td>
<td>• Tachycardia • Headache • Hypoglycemia • Nausea • Constipation • Vomiting</td>
<td>• 0.6 mg once daily for 1 week, then increase to 1.2 mg once daily; may increase up to 1.8 mg once daily if optimal glycemic response not achieved with 1.2 mg once daily • Initial starting dose is intended to reduce GI symptoms and does not provide effective glycemic control • Subcutaneous administration • Box warning: risk of developing thyroid C-cell tumors • Take with or without food • Drink non-caffeine liquids</td>
</tr>
</tbody>
</table>

Prepared by Jasmine Mangrum and Jeanine P. Abrons