

# Step-Wise Dosing and Titration of Oral Medications for Type 2 Diabetes last update 5/3/10

A1C	S Creatinine	Medications	Dosing and Titration guidelines - <i>(Recheck A1C in 3 months)</i>												
7-8	Less than 1.4	<p><b>Start single agent</b></p> <ul style="list-style-type: none"> <li>Metformin 500 mg twice a day with food</li> </ul> <p><b>If on max tolerated dose of metformin, add 2nd oral agent</b></p> <ul style="list-style-type: none"> <li>Add sulfonylurea (preferred due to cost)</li> <li>Add pioglitazone</li> </ul> <p><b>Sulfonylurea starting doses before breakfast:</b></p> <ul style="list-style-type: none"> <li>Glipizide 2.5 mg</li> <li>Glyburide 2.5 mg</li> <li>Glimepiride 1 mg</li> </ul> <p><b>Pioglitazone starting dose is:</b></p> <ul style="list-style-type: none"> <li>Pioglitazone 15-30 mg per day</li> </ul>	<p><b>Increase every 1-2 weeks</b></p> <ul style="list-style-type: none"> <li>Metformin: by 500 mg daily if preprandial blood glucose values are greater than 130-150.                             <ul style="list-style-type: none"> <li><b>Note:</b> slow titration is needed to decrease GI side effects</li> <li><b>Note:</b> metformin use is contraindicated in renal dysfunction (Scr&gt;1.5mg/dL in men or Scr&gt;1.4mg/dL in females) and should not be used in patients aged &gt;80 unless a measured creatinine clearance is within normal limits.</li> </ul> </li> <li>Glipizide or Glyburide: add 2.5 mg in the evening and then increase by 2.5 mg in the morning alternating with increasing evening dose if preprandial blood glucose values are greater than 130-150.</li> <li>Glimepiride: by 1 mg daily if preprandial blood glucose values are greater than 130-150</li> <li>Pioglitazone : by 15 mg per day if A1C is greater than 7 in 3 months.                             <ul style="list-style-type: none"> <li><b>Note:</b> slower dose titration for pioglitazone</li> <li><b>Note:</b> Rosiglitazone has been associated with increased incidence of adverse events. (American Diabetes Association: Consensus 2009 and 2007 Black Box Warning)</li> </ul> </li> </ul> <table border="0"> <thead> <tr> <th><u>Name</u></th> <th><u>MAX doses</u></th> </tr> </thead> <tbody> <tr> <td>Metformin -</td> <td>1000 mg BID</td> </tr> <tr> <td>Glipizide -</td> <td>20 mg BID</td> </tr> <tr> <td>Glyburide -</td> <td>10 mg BID</td> </tr> <tr> <td>Glimepiride -</td> <td>8 mg daily</td> </tr> <tr> <td>Pioglitazone-</td> <td>45 mg daily</td> </tr> </tbody> </table>	<u>Name</u>	<u>MAX doses</u>	Metformin -	1000 mg BID	Glipizide -	20 mg BID	Glyburide -	10 mg BID	Glimepiride -	8 mg daily	Pioglitazone-	45 mg daily
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Glipizide -	20 mg BID														
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Pioglitazone-	45 mg daily														
7-8	1.4-2	<p><b>Start single agent sulfonylurea OR pioglitazone</b></p> <p><b>If on a single agent, add 2nd oral agent</b></p> <ul style="list-style-type: none"> <li>Add sulfonylurea if patient already on pioglitazone</li> <li>Add pioglitazone if patient already on sulfonylurea</li> </ul>	<ul style="list-style-type: none"> <li>Increase sulfonylurea or pioglitazone according to dosing titration above</li> </ul> <p><b>Note:</b> glipizide max dose = 20 mg per day in 1-2 doses due to renal insufficiency                      glyburide = Avoid use of glyburide in CrCl&lt;50ml/min                      glipizide = Avoid use of glipizide in CrCl &lt;10ml/min</p>												
	Greater than 2	<p><b>Start single agent pioglitazone</b></p> <p><b>If on a single agent, consider basal insulin</b></p>	<ul style="list-style-type: none"> <li>Increase pioglitazone according to dosing titration above</li> <li>See insulin table for titration of doses</li> </ul>												

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A1C	S Creatinine	Medications	Dosing and Titration guidelines – ( <i>Recheck A1C in 3 months</i> )
8-9	Less than 1.4	<p><b>Start combination therapy:</b></p> <ul style="list-style-type: none"> <li>Metformin 500 mg twice a day with food <b>AND</b></li> <li>Sulfonylurea starting doses:                             <ul style="list-style-type: none"> <li>Glipizide 5 mg BID before meals</li> <li>Glyburide 5 mg BID before meals</li> <li>Glimepiride 2 mg daily before breakfast</li> </ul> </li> </ul> <p style="text-align: center;"><b><u>OR</u></b></p> <ul style="list-style-type: none"> <li>Metformin 500 mg twice a day with food <b>AND</b></li> <li>Pioglitazone 15-30 mg per day (Metformin w/sulfonylurea is preferred)</li> </ul>	<p><b>Increase every 1-2 weeks</b></p> <ul style="list-style-type: none"> <li>Metformin: by 500 mg daily if preprandial blood glucose values are greater than 130-150.                             <ul style="list-style-type: none"> <li><b>Note:</b> slow titration is needed to decrease GI side effects</li> <li><b>Note:</b> metformin use is contraindicated in renal dysfunction(Scr&gt;1.5mg/dL in men or Scr&gt;1.4mg/dL in females) and ) and should not be used in patients aged &gt;80 unless a measured creatinine clearance is within normal limits.</li> </ul> </li> <li>Glipizide or glyburide: add 2.5 mg in the morning alternating with increasing evening dose if preprandial blood glucose values are greater than 130-150 up to max dose.</li> <li>Glimepiride: by 1 mg daily if preprandial blood glucose values are greater than 130-150 up to max dose.</li> <li>Pioglitazone: by 15 mg per day if A1C is greater than 7 in 3 months. <b>Note:</b> slower dose titration for pioglitazone : rosiglitazone has been associated with increased incidence of adverse events. (American Diabetes Association: Consensus 2009 and 2007 Black Box Warning) (MAX doses listed above in yellow section)</li> </ul>
8-9	1.4-2	<b>Start combination therapy with sulfonylurea and pioglitazone</b>	<ul style="list-style-type: none"> <li>Increase sulfonylurea or pioglitazone according to dosing titration above</li> </ul> <p><b>Note:</b> glipizide max dose = 20 mg per day in 1-2 doses due to renal insufficiency glyburide = Avoid use of glyburide in CrCl&lt;50ml/min glipizide = Avoid use of glipizide in CrCl &lt;10ml/min</p>
8-9	Greater than 2	<b>Start single agent pioglitazone</b> <b><u>OR</u></b> Begin basal insulin, basal insulin with pre-meal boluses, or premixed insulin	<ul style="list-style-type: none"> <li>Increase pioglitazone according to dosing titration above</li> <li>See insulin table for titration of doses</li> </ul>
<p><b>Byetta® (exenatide) - Can consider if patient fails sulfonylurea and/or metformin; BMI greater than 27; and Creatinine clearance greater than 30mL/min</b> Dosing- 5 mcg SQ BID for 1 month and then increase to 10 mcg SQ BID (MAX dose) if preprandial blood glucose values are greater than 130-150</p>			
A1C	S Creatinine	Medications	Dosing and Titration guidelines – ( <i>Recheck A1C in 3 months</i> )
Greater than 9	Less than 1.4	<b>Begin combination therapy:</b> metformin <b>AND</b> basal insulin, basal insulin with pre-meal boluses or premixed insulin	<ul style="list-style-type: none"> <li>Increase metformin according to dosing titration above</li> <li>See insulin table for titration of doses</li> </ul>
Greater than 9	Greater than 1.4	Begin basal insulin, basal insulin with pre-meal boluses or premixed insulin	<ul style="list-style-type: none"> <li>See insulin table for titration of doses</li> </ul>

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