

# Medication Chart for Type 2 Diabetes

Med Group Descriptor, Drug Class, Drug Name	Action, Side Effects, Notes	Dosing		Considerations
		Frequency/Day	Dosage Ranges	
<b>FDA Indication is always the following except where noted differently:</b>				
Adult (≥ 18 yo): T2DM as monotherapy and combo therapy. Pediatrics (< 18 yo): Role has not been established in T2DM				
<b>Biguanides</b>				
<b>Metformin</b> (GLUCOPHAGE)  <i>Also available in sustained release and oral solution: GLUCOPHAGE XR, FORTAMET, GLUMETZA, RIOMET</i>	<b>Action:</b> Reduces the amount of glucose the liver releases between meals. <b>Side effects:</b> Gas, diarrhea, upset stomach, nausea, abdominal pain. In rare cases, lactic acidosis may occur in people with abnormal liver or kidney function. <b>Notes:</b> Take with food to decrease gas, diarrhea.	<b>For metformin:</b> 2–3 times/day. Take with meals to avoid stomach upset.  <b>For sustained release:</b> 1–2 times/day, with meals.  <b>For oral solution:</b> 2–3 times/day, with meals.	500-2,550 mg/day  Maximum effective dose = 2,000 mg/day	Cautious use of metformin with renal impairment (Scr >1.5 md/dL in men; Scr >1.4 mg/dL in women or GFR <60).  Average A1c decrease 1-2%.
<b>Sulfonylureas (SU)</b>				
<b>Glipizide</b> (GLUCOTROL) <i>Also available in extended release: (GLUCOTROL XL)</i>	<b>Action:</b> Stimulates pancreas to release more insulin right after a meal and then over many hours. <b>Side effects:</b> Potential for hypoglycemia.	1–2 times/day, 30 minutes pre-meal.	2.5-40 mg/day (IR product)	Preferred sulfonylurea in CKD, elderly. Average A1c decrease 1-2%. Less hypoglycemia than glyburide.
<b>Glyburide</b> (MICRONASE, MICRONASE DIABETA) <i>Also available in micronized: GLYNASE PRESTABS</i>		<b>For extended release:</b> 1–2 times/day, with meals.	5-20 mg/day (XL product)	
<b>Glimepiride</b> (AMARYL)		1–2 times/day. Take with meals to avoid hypoglycemia.	1.25-20 mg/day Near maximal effect is observed at 10 mg/day	Average A1c decrease 1-2%.
<b>Meglitinides (Glinide)</b>				
<b>Repaglinide</b> (PRANDIN)	<b>Action:</b> Stimulates pancreas to release more insulin right after a meal. <b>Side effects:</b> Potential for hypoglycemia.	2–4 times/day, 0–30 min pre meals. Skip meal, skip dose. Add meal, add dose to total of 4 doses/day.	0.5-16 mg/day	Average A1c decrease 0.5-1%.
<b>Nateglinide</b> (STARLIX)		1–3 times/day, 0–30 min pre meals. Skip meal, skip dose.	180-360 mg/day	
<b>Thiazolidinediones (TZD)</b>				
<b>Pioglitazone</b> (ACTOS)	<b>Action (both):</b> improves insulin sensitivity. <b>Side effects (both):</b> Weight gain, fluid retention, osteopenia, increase in congestive heart failure in those at risk. <b>Notes:</b> Don't prescribe with family or personal history of bladder cancer.	1 time/day, same time daily.	15-45 mg/day	Black box warning. (contraindicated in established New York Heart Association [NYHA] Class III or IV heart failure and not recommended for use in symptomatic heart failure). Average A1c decrease 1-1.5%.
<b>DPP-4 Inhibitors (Dipeptidyl peptidase-4)</b>				
<b>Sitagliptin</b> (JANUVIA)	<b>Action:</b> Increases insulin secretion following meal. Lowers hepatic glucose production. <b>Side effects:</b> Stuffy nose, sore throat, occasional diarrhea and stomach discomfort.	1 time/day, unrelated to food. Same time daily.	25-100 mg/day	Average A1c decrease 0.5-0.8%.
<b>Linagliptin</b> (TRADJENTA)			5 mg/day	Average A1c decrease 0.5-0.8%.
<b>Saxagliptin</b> (ONGLYZA)			2.5-5 mg/day	Average A1c decrease 0.5-0.8%.

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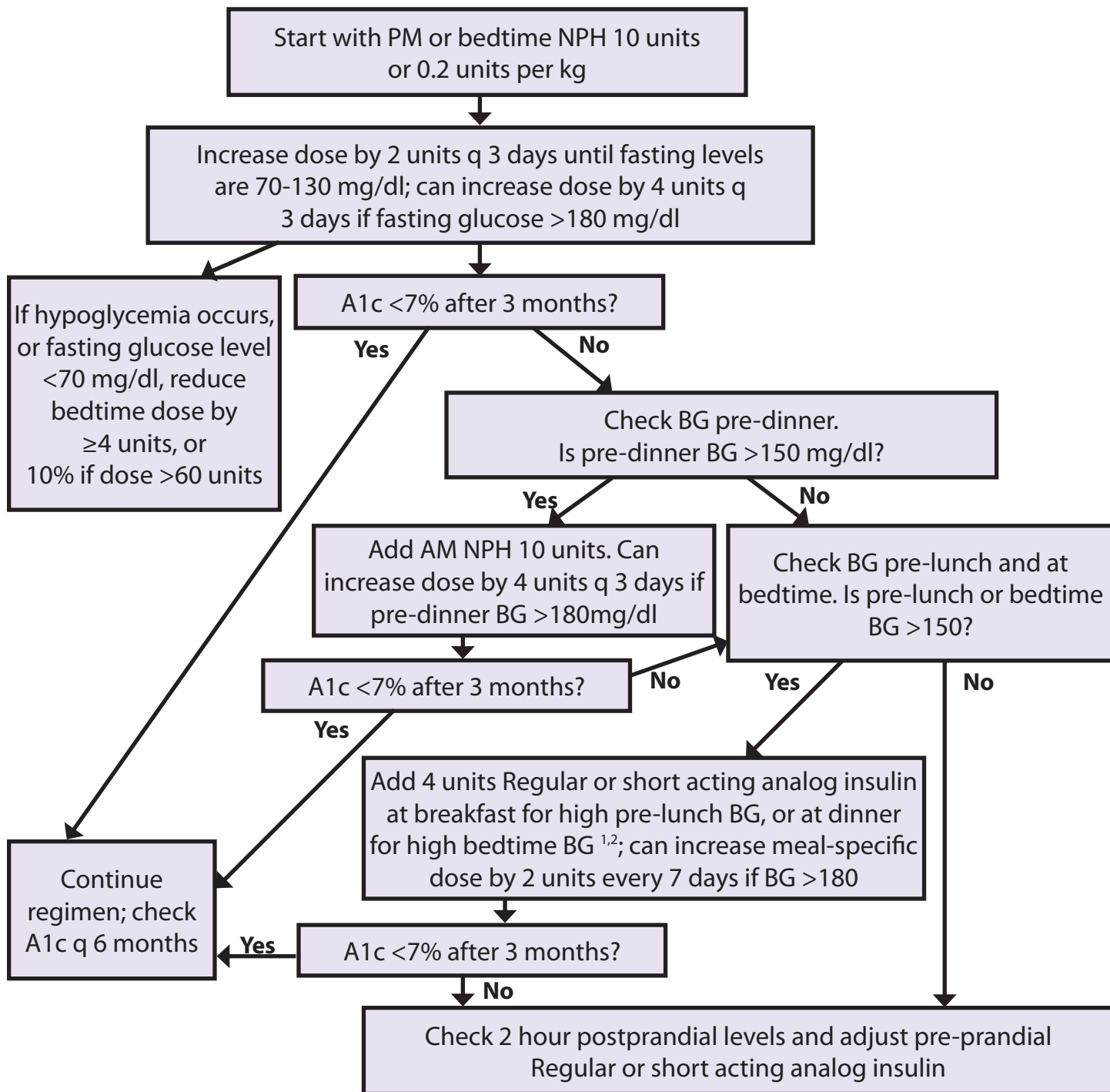
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		Frequency/Day	Dosage Ranges	
<b>Glucagon-Like Peptide-1 (GLP-1)</b>				
<b>Exenatide</b> (BYETTA) <i>Also available in extended release: Exenatide XR (BYDUREON)</i>	<b>Action:</b> Enhances glucose-dependent insulin secretion. <b>Side effects:</b> Nausea, hypoglycemia, vomiting, diarrhea, feeling jittery, dizziness, headache, dyspepsia.	2 times/day. <b>For extended release:</b> 1 time/week.	10-20 mcg/day. <b>For extended release:</b> 2 mg/week.	Average A1c decrease 0.5-1%.
<b>Liraglutide</b> (VICTOZA)		1 time/day.	0.6-1.8 mg/day.	Average A1c decrease 0.5-1%.
<b>Alpha-Glucosidase Inhibitors (AGI)</b>				
<b>Acarbose</b> (PRECOSE)	<b>Action:</b> Delays absorption and breakdown of carbohydrates from intestines <b>Side effects:</b> Gas, diarrhea, stomach upset.	3 times/day, with first bite of meal.	75-300 mg/day.	Average A1c decrease 0.5-1%.
<b>Miglitol</b> (GLYSET)				
<b>Fixed Combinations</b>				
<b>Glipizide and Metformin</b> (METAGLIP)	Available in 2.5mg/250mg, 2.5mg/500mg, and 5mg/500mg strengths.	1-2 times/day, with meals.	See individual products above.	Cautious use of metformin with renal impairment (Scr >1.5 md/dL in men; Scr >1.4 mg/dL in women or GFR <60).  See black box warning for Actos above. Cautious use of metformin with renal impairment (Scr >1.5 md/dL in men; Scr >1.4 mg/dL in women or GFR <60).
<b>Glyburide and Metformin</b> (GLUCOVANCE)	Available in 1.25mg/250mg, 2.5 mg/500mg, and 5mg/500mg strengths.			
<b>Pioglitazone and Metformin</b> (ACTOPLUS MET)	Available in 15mg/500mg and 15mg/850mg strengths.			
<b>Pioglitazone and Metformin ER</b> (ACTOPLUS MET XR)	Available in 15mg/1000mg and 30mg/1000mg strengths.	1 time/day, with evening meal.		
<b>Pioglitazone and Glimepride</b> (DUETACT)	Available in 30mg/2mg and 30mg/4mg strengths	1 time/day, before first meal.		See black box warning for Actos above.
<b>Sitagliptin and Metformin</b> (JANUMET)	Available in 50mg/500mg and 50mg/1000 mg strengths.	2 times/day, taken with food.		Cautious use of metformin with renal impairment (Scr >1.5 md/dL in men; Scr >1.4 mg/dL in women or GFR <60).
<b>Saxagliptin and Metformin</b> (KOMBIGLYZE XR)	Available in 5mg/500mg, 5mg/1000 mg and 2.5mg/1000mg strengths.	1 time/day, taken with food.		

<b>Insulins</b>			
<b>Bolus Insulin: Rapid- or Short-Acting</b>	<b>Onset of Action</b>	<b>Peak Effect</b>	<b>Duration of Action</b>
Lispro (Humalog), aspart (Novolog), glulisine (Apidra)	15 - 30 minutes	30 - 150 minutes	≤ 5 hours
Regular (Humulin R, Novolin R)	30 minutes	2.5 - 5 hours	4 - 12 hours
<b>Basal Insulin: Intermediate- or Long-Acting</b>	<b>Onset of Action</b>	<b>Peak Effect</b>	<b>Duration of Action</b>
NPH (Humulin N, Novolin N)	About 2 hours	4 - 12 hours	12 - 20 hours
Detemir (Levemir)	3 - 4 hours	3 - 9 hours	16 - 23 hours
Glargine (Lantus)	3 - 4 hours	No peak	≥ 24 hours
<b>Insulin Mixes</b>	<b>Onset of Action</b>	<b>Peak Effect</b>	<b>Duration of Action</b>
NPH/regular (Humulin 70/30, Novolin 70/30)	See individual products above.		
Lispro protamine/lispro (Humalog Mix 50/50, Humalog Mix 75/25)			
Aspart protamine/aspart (Novolog Mix 70/30)			

See pages 3-4 for insulin titration algorithms >>

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## Insulin Titration Algorithm for NPH

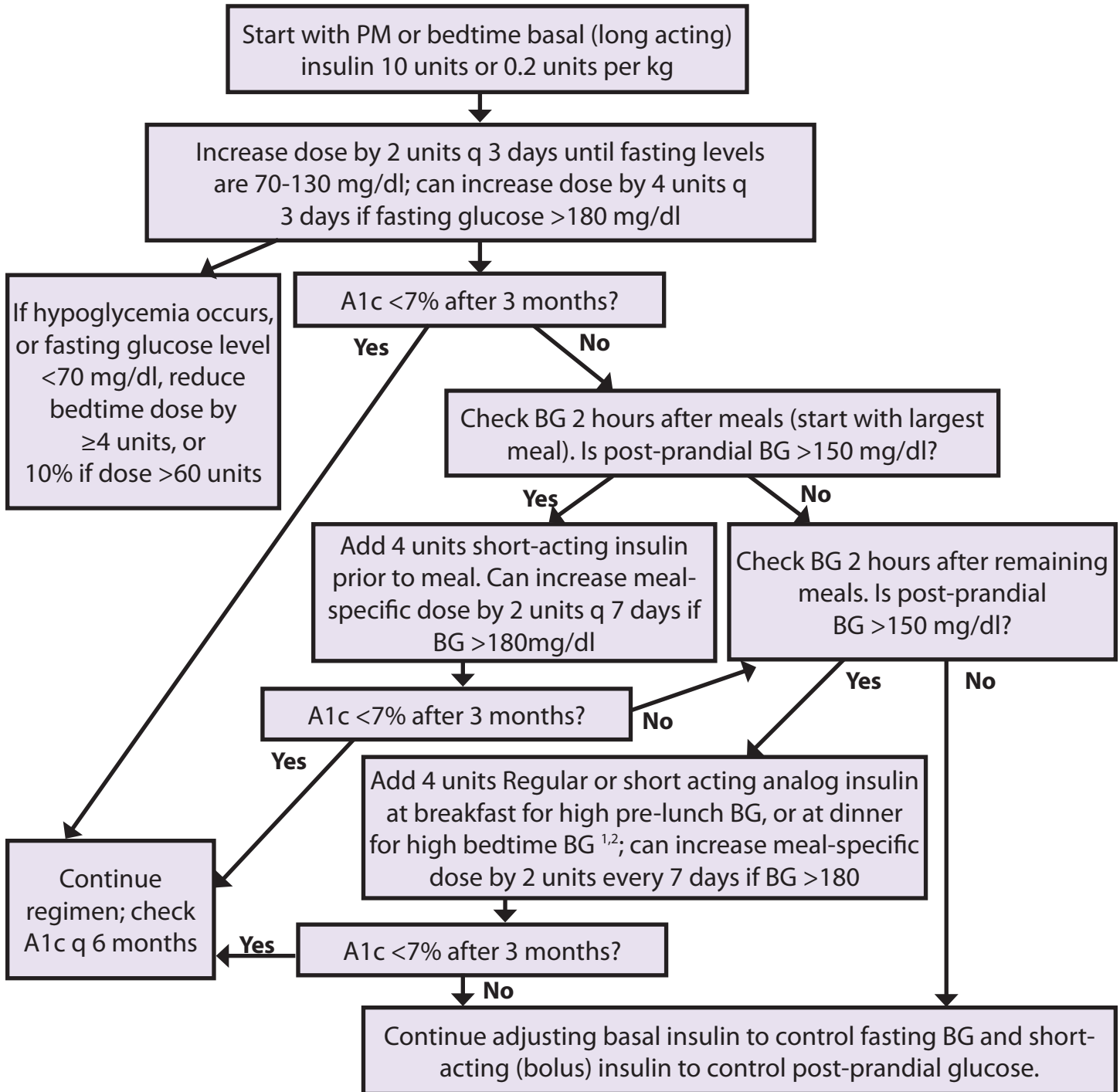


1. Sulfonylurea should be discontinued when Regular or short acting analog insulin is started.
2. For ease of dosing, Regular or short acting analog insulin can be combined with NPH at breakfast and/or dinner (use of 70/30 insulin should be avoided unless patient is unable to comply with mixed regimen). If frequent hypoglycemia occurs >4 hours after dinner, fast-acting insulin could be given alone at dinner and NPH moved to bedtime.

**NOTE:** Consider Glargine (Lantus) instead of NPH if: 1) hypoglycemia occurs due to NPH/fast-acting insulin overlap despite dosage-time adjustments, OR 2) patient unable to comply with multiple injections per day. Refer to basal/bolus insulin algorithm on page 4.

# Medication Chart for Type 2 Diabetes

## Insulin Titration Algorithm for Basal/Bolus Insulin



1. Sulfonylurea should be discontinued when Regular or short acting analog insulin is started.
2. Long acting analog insulin (Glargine) should NOT be mixed with other insulins.