

Appendix A

COMMONLY USED ANTIDIABETIC AGENTS

COMMONLY USED ORAL ANTIDIABETIC AGENTS

The following charts include commonly used medications for diabetes. Drug information was obtained from pharmaceutical inserts and may not reflect individual provider opinions or practices.

CLASS	GENERIC NAME STRENGTH	TRADE NAME®	USUAL DOSAGE	COMMENTS <i>Regular home blood glucose testing should be considered for medication initiation, adjustments, or additions.</i>
Biguanides	metformin 500, 850, 1000 mg 500 mg/5 ml	Glucophage Riomet	500-1000 mg bid	Decreases hepatic glucose production and increases insulin sensitivity. When used as monotherapy, does not cause hypoglycemia. Take with food to lessen gastrointestinal (GI) side effects. Do not use with impaired renal or hepatic function. Hold for iodinated contrast study. Start at 500 mg bid or 850 mg qd, increase 500 mg weekly or 850 mg every 2 weeks. Max 2550 mg/day; however, most studies show little benefit over 2000 mg/day. Start dose low and titrate slowly to minimize GI effects. Extended release formulation may be given once daily. Do not crush. Monitor Serum Creatinine (SCr) at baseline and at least yearly, more often if indicated. Discontinue if age greater than 80 or SCr is > 1.5 in males and 1.4 in females. Hold if dehydrated or septic; increases risk of lactic acidosis. Potential for vitamin B-12 deficiency.
	metformin extended release (ER) 500, 750, 1000 mg	Glucophage XR Glumetza Fortamet	1000-2000 mg q pm 1000-2500 mg q pm May be divided bid	
Second-generation Sulfonylureas	glipizide 5, 10 mg glipizide extended release (ER) 2.5, 5, 10 mg	Glucotrol Glucotrol XL	5-20 mg qd to bid 2.5-20 mg qd	Stimulates pancreatic islet beta cell insulin release. Start at 5mg qd or 2.5 mg qd if elderly. The extended release (ER) formulation may allow for once daily dosing. For non-ER form, divide doses > 15 mg/day. Max 40 mg qd. Do not cut or crush the ER form.
First-generation Sulfonylureas are rarely used and are not included in this table	glyburide 1.25, 2.5, 5 mg	Micronase, Diabeta	1.25-20 mg qd	Start at 2.5 to 5 mg qd or 1.25 mg qd if at risk of hypoglycemia. Max 20 mg qd. Take with breakfast or first meal.
Caution in elderly patients	glyburide (micronized) 1,5,3,6 mg	Glynase PresTab	0.75-12 mg qd	No advantages over the nonmicronized products. Start at 1.5-3 mg qd or 0.75 mg qd if risk for hypoglycemia. Take with breakfast or first meal.
	Glimepiride 1, 2, 3, 4, 6, 8 mg	Amaryl	1-4 mg qd	Dosage once daily with first main meal. Start at 1-2 mg po qd. Titrate by 1-2 mg every 1 to 2 weeks. Max 8 mg qd. Take with first main meal.

COMMONLY USED ORAL ANTIDIABETIC AGENTS (Continued)

CLASS	GENERIC NAME STRENGTH	TRADE NAME®	USUAL DOSAGE	COMMENTS
Insulin Secretagogues Meglitinides	repaglinide 0.5, 1, 2 mg	Prandin	0.5-4 mg before meals	Similar mechanism of action as the sulfonylureas (insulinotropic). Unlikely to cause hypoglycemia if given with meals. Start at 0.5 mg before each meal, double preprandial dose weekly. Max 4 mg/dose; 16 mg/day. Take 15-30 minutes before a meal. Skip dose if meal is skipped. Do not use in combination with sulfonylureas or other secretagogues.
	nateglinide 60, 120 mg	Starlix	60-120 mg tid 1-30 minutes before meals	Similar mechanism of action as the sulfonylureas (insulinotropic). Use with caution in chronic liver disease. Unlikely to cause hypoglycemia if given with meals. Should not be added to regimens of patients who have not been adequately controlled by glyburide or other insulin secretagogues. Start 60-120 mg po tid. Skip dose if meal is skipped. Do not use in combination with sulfonylureas or other secretagogues.
Thiazolidinediones (TZD)	rosiglitazone 2, 4, 8 mg	Avandia	Start 4 mg	Increases peripheral and hepatic sensitivity to insulin. Approved for use as monotherapy or in combination with insulin, metformin, or sulfonylureas. Neither causes hypoglycemia when used as monotherapy. Start Actos at 15 mg qd. Start Avandia at 4 mg qd or 2 mg bid. May increase dose after 12 weeks. Maximum dose of Actos is 45 mg qd and Avandia is 8 mg qd. Use with caution in the presence of hepatic disease. Monitor baseline transaminase when initiating therapy, then periodically as clinically indicated.
	pioglitazone 15, 30, 45 mg	Actos	15-45 mg	Monitor for symptoms and signs of congestive heart failure at 6 weeks and 3 months. In patients with CHF, thiazolidinediones use is contraindicated.* Use caution in prescribing thiazolidinediones for patients with preexisting edema or other heart diseases. It has been suggested that rosiglitazone may increase the risk of myocardial infarction. If a glitazone is used, pioglitazone should be preferred. ¹ May cause anovulatory premenopausal women to resume ovulation. * Package insert states contraindicated in NYHA class III-IV CHF or symptomatic CHF, caution with class I-II.

COMMONLY USED ORAL ANTIDIABETIC AGENTS (Continued)

CLASS	GENERIC NAME STRENGTH	TRADE NAME®	USUAL DOSAGE	COMMENTS
Alpha-glucosidase inhibitors	acarbose 25,50, 100 mg	Precose	50-100 mg tid	Delays and decreases absorption of starch after a meal. Take with first bite of food. When used as a monotherapy, does not cause hypoglycemia. Most common side effect is excessive flatulence, diarrhea, and abdominal pain. Start 25 mg tid. Max 100 mg tid. Start dose low and titrate slowly to minimize GI effects. Contraindicated in diabetic ketoacidosis (DKA), inflammatory bowel disease, colonic ulceration, or partial intestinal obstruction. If hypoglycemia occurs in patients who are being treated with Precose or Glyset, it MUST be treated with glucose, not sucrose or complex carbohydrates.
	miglitol 25, 50, 100 mg	Glyset	50-100 mg tid	
Dipeptidyl peptidase-4 (DPP-4) Inhibitors	sitagliptin 25, 50, 100 mg	Januvia	100 mg qd	Inhibits dipeptidyl peptidase-4, slowing incretin metabolism, increasing insulin synthesis and release, and decreasing glucagon levels. Regulates glucose by affecting the beta cells and alpha cells in the pancreas. Approved as monotherapy and as add-on therapy to metformin or TZDs.
Medications: Oral Combination				
Glyburide/ Metformin	1.25/250, 2.5/500, 5/500 mg	Glucovance	1-2 tabs bid	Refer to comments on individual drugs.
Glipizide/ Metformin	2.5/250, 2.5/500, 5/500 mg	Metaglip	1-2 tabs qd-bid	
Metformin/ Rosiglitazone	500/2, 500/4, 1000/2, 1000/4 mg	Avandamet	1-2 tabs bid	
Metformin/ Pioglitazone	500/15, 850/15 mg	ACTOplusmet	1 tab qd-bid	
Rosiglitazone/ Glimepiride	4/1, 4/2, 4/4 mg	Avandaryl	1 tab q am	
Sitagliptin/ Metformin	50/500, 50/1000 mg	Janumet	1 tab bid	

COMMONLY USED INJECTABLE ANTIDIABETIC AGENTS

CLASS	GENERIC NAME STRENGTH	TRADE NAME®	USUAL DOSAGE	COMMENTS
Incretin Mimetic	exenatide injection	Byetta	5 mcg-10 mcg	<p>Incretin mimetics stimulate insulin production in response to elevated blood glucose levels, inhibit post-meal glucagon release, and slow nutrient absorption. Adjunct therapy for type 2 patients who have not achieved adequate glycemic control. When added to sulfonylurea therapy, a reduction in the dose of sulfonylurea may be considered to reduce the risk of hypoglycemia. Starting dose is 5 mcg bid. Increase to 10 mcg bid in one month if tolerated. Inject within 60 minutes before the morning and evening meals.</p> <p>PRECAUTIONS: Byetta is not a substitute for insulin in insulin-requiring patients. Byetta should not be used in patients with type 1 diabetes for the treatment of DKA. The concurrent use of Byetta with insulin, TZDs, D-phenylalanine derivatives, meglitinides, or alpha-glucosidase inhibitors has not been studied. Not recommended for use in patients with end-stage renal disease or severe renal impairment, or in patients with severe gastrointestinal disease. Byetta slows gastric emptying and may reduce the absorption of orally administered drugs. Drugs requiring food at the time of administration should be taken with a meal or snack when Byetta is not administered. Medications dependent on threshold concentrations for efficacy, such as contraceptives and antibiotics, should be taken at least 1 hour before Byetta injection.</p> <p>SIDE EFFECTS: Observe for hypoglycemia if prescribed with a sulfonylurea. Other adverse events associated with Byetta (vs. placebo) include nausea (44% vs. 18%), vomiting (13% vs. 4%), and diarrhea (13% vs. 6%).</p> <p>Cases of acute pancreatitis have been reported. Inform patients to discontinue Byetta if they have persistent severe abdominal pain with or without vomiting. Do not start or restart Byetta in patients with a history of pancreatitis.</p>
Amylin Analogue	pramlintide injection	Symlin	Type 1 30-60 mcg before meals Type 2 60-120 mcg before meals	<p>Used in both type 1 and type 2 patients on insulin. Decreases postprandial plasma glucose rise, suppresses glucagon secretion, delays gastric emptying, and promotes satiety. Used with meals. Start patients with type 1 diabetes at 15 mcg sc tid and titrate to 45 mcg tid as needed. Start type 2 patients at 30 mcg sc tid and titrate to 120 mcg tid as needed.</p>

MEDICATIONS: INSULIN

MEDICATIONS: INSULIN				
INSULIN TYPE Trade name®	ONSET	PEAK	DURATION	COMMENTS
Very short-acting insulin lispro Humalog (Lilly)	15-30 minutes	1-4 (0.8-4.3) hours	3-5 hours	<i>Regular home blood glucose testing should be considered for medication initiation, adjustments, or additions.</i> Insulins lispro, aspart, and glulisine are very short-acting products. Both lispro and aspart are available mixed with intermediate-acting preparations as fixed-ratio combinations, which provide the benefit of rapid and intermediate action. All clear insulins. Can mix with NPH. Do not mix with detemir or glargine.
Very short-acting insulin aspart NovoLog (NovoNordisk)	10-20 minutes	1-3 hours	3-5 hours	
Very short-acting insulin glulisine Apidra (Sanofi-Aventis)	10-15 minutes	1-1.5 hours	3-5 hours	
Short-acting regular insulin	30 minutes-1 hour	4-5.5 hours	6-10 hours	Clear insulin. Can mix with NPH. Do not mix with detemir or glargine
Intermediate-acting NPH insulin	1-2 hours	3.5-9.5 hours	16-24 hours	NPH and regular insulins are also available as fixed-ratio combinations of 50/50 and 70/30.
Long-acting insulin glargine Lantus (Aventis) approved in pediatric population > 6 years Insulin detemir Levemir (Novo)* approved in pediatric population ≥ 6 years	1 hour 0.8-2 hours (dose dependent)	No pronounced peak	24 hours Up to 24 hours (dose dependent)	Once daily subcutaneous administration at a consistent time in patients who require basal (long-acting) insulin (glargine) or once or twice daily (detemir) for the control of hyperglycemia. Neither should be diluted nor mixed with any other insulin or solution, and is not intended for intravenous administration.

MEDICATIONS: INSULIN (Continued)

MEDICATIONS: Insulin				
PRE-MIXED				
INSULIN TYPE Trade name®	ONSET	PEAK	DURATION	COMMENTS
<i>Humalog Mix 75/25</i> Eli Lilly 25% insulin lispro/ 75% insulin lispro protamine	Faster than Humulin 70/30	1-6.5 hours	Up to 24 hours (similar to <i>Humulin 70/30</i>).	<i>Regular home blood glucose testing should be considered for medication initiation, adjustments, or additions.</i> Give within 15 minutes of a meal; suspension is cloudy, mix gently/do not shake
<i>Humulin 70/30</i> Eli Lilly 70% NPH/ 30% regular	30-60 minutes	1.5-16 hours	Effective: 10 to 16 hours Max: Up to 18 to 24 hours	Give 30 minutes before meals; suspension is cloudy, mix gently/do not shake
<i>Novolog Mix 70/30</i> Novo Nordisk 30% insulin aspart/ 70% insulin aspart protamine	10-20 minutes	1-4 hours	Effective: 15 to 18 hours Max: Up to 24 hours	Give within 15 minutes of a meal; suspension is cloudy, mix gently/do not shake
<i>Novolin 70/30</i> Novo Nordisk 70% NPH/ 30% regular	30-60minutes	2-12 hours	Effective: 10 to 16 hours ² Max: Up to 18 to 24 hours ³	Give 30 minutes before meals; suspension is cloudy, mix gently/do not shake
<i>Humulin 50/50</i> Eli Lilly 50% NPH/ 50% regular	30-60minutes	2-5.5 hours	Effective: 10 to 16 hours Max: Up to 18 to 24 hours	Give 30 minutes before meals; suspension is cloudy, mix gently/do not shake
<i>Humalog 50/50</i> 50% NPH/ 50% lispro	Faster than Humulin 50/50	0.8-4.8 hours	Similar to Humulin 50/50	Give within 15 minutes of a meal; suspension is cloudy, mix gently/do not shake