

### Blood Glucose Levels for Diabetics

A1c <7.0%

Preprandial (meal) capillary plasma glucose  
70–130 mg/dl

Peak postprandial (meal) capillary plasma glucose\*  
<180 mg/dl

\*Postprandial glucose measurements should be made 1–2 h after the beginning of the meal, which is generally when BG is at peak level in people with diabetes.

**Table 2. Combination Oral Glucose-Lowering Agents**

Trade Name	Individual Medications	Relative Risk of Hypoglycemia
Glucovance <sup>®</sup>	glyburide-metformin	High
Metaglip <sup>®</sup>	glipizide-metformin	High
Avandaryl <sup>™</sup>	rosiglitazone-glimepiride	High
Avandamet <sup>™</sup>	rosiglitazone-metformin	Low
Actoplus Met <sup>™</sup>	pioglitazone-metformin	Low
Janumet <sup>™</sup>	sitagliptin-metformin	Low
Kombiglyze <sup>™</sup> XR	saxagliptin-metformin	Low

\*See note on prescribing restrictions for rosiglitazone which also apply to these combination medications.

**Table 3. Insulins with Timing of Actions**

Category of Insulin by Timing of Action	Brand name (generic)	Timing of Onset	Timing of Peak Action	Duration of Action	Comments
Rapid-acting	Humalog <sup>®</sup> (lispro)	5-15 min	30-90 min	<5 hr	Little variability in absorption; used in continuous subcutaneous insulin infusion
	Novolog <sup>®</sup> (aspart)				
	Apidra <sup>®</sup> (glulisine)				
Short-acting	Humulin <sup>®</sup> R (regular)	30-60 min	2-3 hr	5-8 hr	Duration and intensity of action are dose-dependent; IV administration
	Novolin <sup>®</sup> R (regular)				
Intermediate-acting	Humulin <sup>®</sup> N (NPH)	2-4 hr	4-10 hr	10-16 hr	Duration and intensity are dose-dependent; highly variable absorption
	Novolin <sup>®</sup> N (NPH)				
Long-acting	Lantus <sup>®</sup> (glargine)	2-4 hr	No peak	20-24 hr	“Peakless;” should not be mixed in the syringe with other insulins
	Levemir <sup>®</sup> (detemir)	3-8 hr	No peak	5.7-23.2 hr	Dose-dependent onset
Fixed Combinations	Humulin <sup>®</sup> 70/30	30-60 min	Dual	10-16 hr	70% NPH and 30% regular
	Novolin <sup>®</sup> 70/30	30-60 min	Dual	10-16 hr	70% NPH and 30% regular
	Humulin <sup>®</sup> 50/50	5-15 min	Dual	10-16 hr	50% NPH and 50% regular
	Humalog <sup>®</sup> -Mix 75/25	5-15 min	Dual	10-16 hr	75% NPL and 25% lispro
	Novolog <sup>®</sup> Mix 70/30	5-15 min	Dual	10-16 hr	70% NPA and 30% aspart

NPL=NPH combined with lispro, NPA=NPH combined with aspart

**Table 1. Oral Glucose-Lowering Agents**

Drug Class	Action	Generic name	Trade name(s), generic	Comments
Sulfonylureas	Stimulate insulin release from beta cells	Tolbutamide	Orinase <sup>®</sup> , generics	Risk of hypoglycemia, gastric distress, and weight gain; is a first-generation, short half-life, kidney impairment may require a decreased dose; can be taken in divided doses to improve GI tolerance
		Tolazamide	Tolinase <sup>®</sup> , generics	Risk of hypoglycemia, gastric distress, and weight gain; is a first-generation, absorbed more slowly than other sulfonylureas, kidney impairment may require a decreased dose; doses over 500 mg/day should be given in divided doses
		Chlorpropamide	Diabinese <sup>®</sup> , generics	Risk of hypoglycemia, nausea, and weight gain; is a first-generation, longest duration of action of first-generation sulfonylureas; to be avoided in older adults; kidney impairment may require a decreased dose
		Glyburide	DiaBeta <sup>®</sup> , Micronase <sup>®</sup> , Glynase Prestabs <sup>®</sup> , generics	Risk of hypoglycemia and weight gain; is a second-generation; kidney impairment may require a decreased dose
		Glipizide	Glucotrol <sup>®</sup> , Glucotrol XL <sup>®</sup> , generics	Risk of hypoglycemia and weight gain; is a second-generation with the shortest half-life; kidney impairment may require a decreased dose; taken 30 minutes before meals
		Glimepiride	Amaryl <sup>®</sup> , generics	Risk of hypoglycemia and weight gain; is a second-generation; kidney impairment may require a decreased dose
Meglitinides (Nonsulfonylurea-secretagogues)	Stimulate insulin release from beta cells	Repaglinide	Prandin <sup>®</sup>	Risk of hypoglycemia and weight gain; precaution with poor kidney and hepatic function
		Nateglinide	Starlix <sup>®</sup>	
Biguanides	Inhibit hepatic glucose output and increases glucose uptake	Metformin	Glucophage <sup>®</sup> , generics	Contraindicated in those with poor kidney function; caution with congestive heart failure, liver disease, and alcohol abuse; side effects of diarrhea during first 7-10 days of use and nausea; risk of lactic acidosis (rare)
		Metformin extended release	Glucophage XR <sup>®</sup>	
Thiazolidinediones (Glitazones, TZDs)	Enhance insulin sensitivity at skeletal muscle, adipose tissue, and liver	Pioglitazone	Actos <sup>®</sup>	Risk of edema and weight gain; precaution with hepatic impairment, may cause or exacerbate heart failure; monitor for symptoms of heart failure (rapid weight gain, dyspnea, edema, etc.) and liver function tests; increased risk of fracture
		Rosiglitazone	Avandia <sup>®</sup>	Risk of edema and weight gain; precaution with hepatic impairment, may cause or exacerbate heart failure; monitor for symptoms of heart failure (rapid weight gain, dyspnea, edema, etc.) and liver function tests; increased risk of fracture; will have restricted availability due to increased risk of myocardial infarction
Alpha-glucosidase Inhibitors	Delay carbohydrate absorption from the intestines	Acarbose	Precose <sup>®</sup>	Dose-related diarrhea, abdominal pain, flatulence; must use oral glucose if hypoglycemia occurs since carbohydrate absorption is delayed
		Miglitol	Glyset <sup>®</sup>	
Incretins	Similar effects to glucagon-like peptide (GLP-1)	Exenatide	Byetta <sup>®</sup>	Precautions with gastroparesis and hypoglycemic unawareness; weight-friendly
		Liraglutide	Victoza <sup>®</sup>	
Amylin analog	Similar to amylin	Pramlintide	Symlin <sup>®</sup>	Approved for treatment of type 1 and type 2 diabetes; precautions with gastroparesis and hypoglycemic unawareness; weight-friendly
Dipeptidyl peptidase IV (DPP-IV) inhibitors	Restore GLP-1 levels; inhibition of enzymatic degradation of glucagon-like peptide-1 (GLP-1)	Sitagliptin	Januvia <sup>®</sup>	Side effects may not yet be known
		Saxagliptin	Onglyza <sup>™</sup>	
		Linagliptin	Tradjenta <sup>®</sup>	