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IN-041603R

DRUG CLASS	ACTION	BRAND NAME	GENERIC NAME	APPEARANCE	*RX or OTC	DRUG TYPE	ONSET (In Hours Unless Noted)	PEAK (Hours)	DURATION (Hours)	COMPATIBLE MIXED WITH	STORAGE/ EXPIRATION**	TYPICAL ADMINISTRATION/ COMMENTS
<b>INSULIN</b>	<b>RAPID</b>	Humalog®	Insulin lispro	<b>CLEAR</b>	Rx	Rapid-Acting Insulin Analog	15 min	0.5-1.5	3-5	NPH	Refrigerate/28 days at room temp	15 minutes prior to meals or immediately after eating
		NovoLog®	Insulin aspart	<b>CLEAR</b>	Rx	Rapid-Acting Insulin Analog	15 min	1-3	3-5	NPH	Refrigerate/28 days at room temp	5-10 minutes before meals
		Apidra®	Insulin glulisine	<b>CLEAR</b>	Rx	Rapid-Acting Insulin Analog	15 min	0.5-1	3	NPH	Refrigerate/28 days at room temp	15 minutes before or within 20 minutes after eating
	<b>SHORT</b>	Humulin® R Novolin® R	Regular insulin; Injectable	<b>CLEAR</b>	OTC	Regular insulin	0.5-1	2.5-5	8-12	NPH	Refrigerate/28 days at room temp	30 minutes prior to meals
		<b>INTERMEDIATE</b>	Humulin® N Novolin® N	Isophane insulin	<b>CLOUDY</b>	Rx	Isophane insulin	1-1.5	4-12	10-24	Insulin Analogs/ Regular Insulin	Refrigerate/28 days at room temp
	<b>LONG</b>	Levemir®	Insulin detemir	<b>CLEAR</b>	Rx	Long-acting insulin analog	1-2	6-8	Up to 24	<b>None</b>	Refrigerate/42 days at room temp	Once or twice daily
		Lantus®	Insulin glargine	<b>CLEAR</b>	Rx	Long-acting insulin complex	1.1	No peak	24	<b>None</b>	Refrigerate/ 28 days at room temp	Once daily, at the same time each day

\* Rx or OTC designation is based upon federal law. State law may differ. It is recommended that you check with your individual state before dispensing.

\*\* The **EXPIRATION DATES** of insulin vials begin AFTER OPENING/PUNCTURING the vial or AFTER REMOVING VIAL FROM REFRIGERATOR, whichever comes first, despite how the vial is stored (refrigerator or room temperature).

*Check individual product information for expiration dates of insulin pens and cartridges.*

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INSULIN	COMBINATION PRODUCTS	Humulin® 70/30 Novolin® 70/30	70% Isophane/ 30% Regular	CLOUDY	OTC	NPH and regular combination	30 min	1.5-16	10-24	None	Refrigerate/28 days at room temp	30 minutes prior to meal
		NovoLog® 70/30	70% Aspart protamine/ 30% Aspart	CLOUDY	Rx	NPH-like and rapid acting combination	15 min	1-4	10-24	None	Refrigerate/28 days at room temp	15 minutes prior to meal
		Humalog® Mix 75/25	75% Lispro protamine/ 25% Lispro	CLOUDY	Rx	NPH-like and rapid acting combination	15 min	1-6.5	10-24	None	Refrigerate/28 days at room temp	15 minutes prior to meal
		Humalog® Mix 50/50	50% Lispro protamine/ 50% Lispro	CLOUDY	Rx	NPH-like and rapid acting combination	15 min	1-6.5	10-24	None	Refrigerate/28 days at room temp	30 minutes prior to meal
		Humulin® 50/50	50% Isophane 50% Regular	CLOUDY	OTC	NPH and regular combination	30 min	2-5.5	10-24	None	Refrigerate/28 days at room temp	30 minutes prior to meal
<b>NON-INSULIN INJECTABLES</b>												
INCRETIN MIMETIC	ADJUNCT THERAPY	Byetta™	Exenatide	CLEAR	Rx	GLP-1 analog		2	10	None	Refrigerate/30 days at room temp or after opening	Within 60 minutes prior to morning and evening meals <i>When initiating, taking close to meals may minimize side effects</i>
AMYLIN ANALOG		Symlin®	Pramlintide	CLEAR	Rx	Amylin analog		20 min	3	None	Refrigerate/28 days at room temp or refrigerated	Immediately prior to each major meal (≥250 kcal or 30g of carbohydrate) acting insulin and fixed-mix insulin dose by 50% upon pramlintide initiation. Do not inject into the arm due to variable absorption.

**TIPS TO IMPROVE INSULIN SAFETY:**

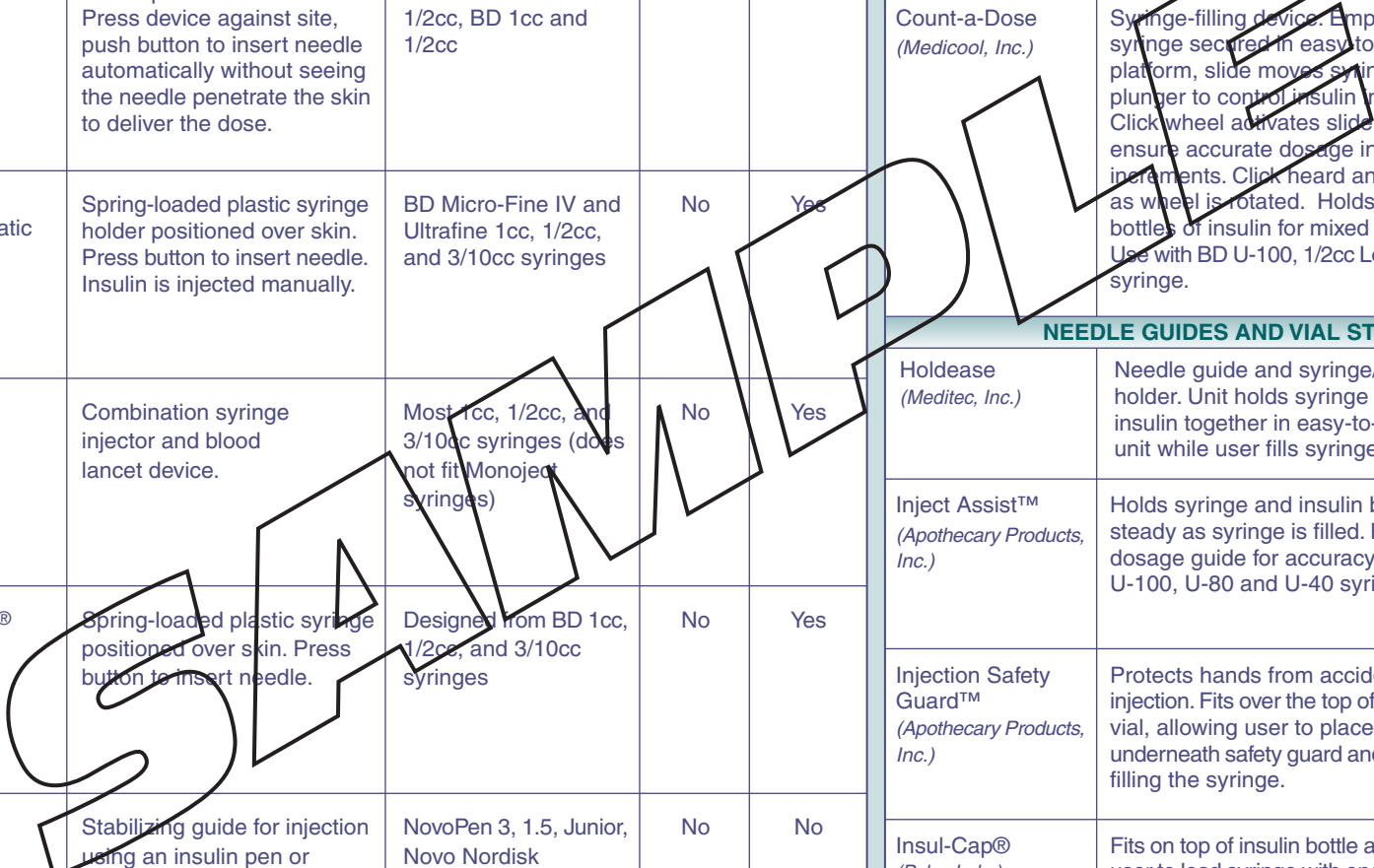
- On orders for insulin, write the word “UNITS” rather than using the abbreviation, “U”
- Since prescription labels are often attached to the outer carton of insulin vials, maintain vigilance when handling a box of insulin prior to administration. Verify that the vial inside matches the outer carton.
- Facilities should maintain policies and procedures related to insulin storage.
- Always use a “DOUBLE-CHECK” system to inspect insulin preparation for correct product selection and correct dosage before administration to the resident.
- Ensure that unused insulin products are discarded or returned to the pharmacy upon discharge of the resident or expiration of the product.
- Due to a lack of information and the use of varying buffering agents, insulins from different manufacturers should not be mixed.

COMMON INJECTABLE SIDE EFFECTS	
Drug	Common Side Effects
Injectable Insulin	Hypoglycemia, Weight gain, Injection site discomfort
Exenatide (Byetta™)	Hypoglycemia, Injection site discomfort
Pramlintide (Symlin®)	Hypoglycemia, Nausea, Vomiting, Headache Injection site discomfort

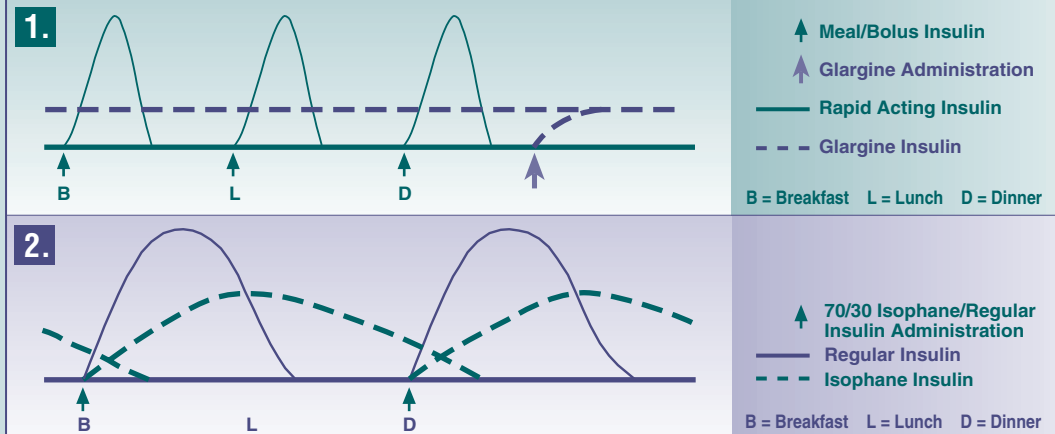
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DIABETES AIDS FOR OLDER ADULTS

INJECTION AIDS					SYRINGE MAGNIFIERS		
Product Name	Description	Syringe Used	Needle Visible	Adjustable Depth of Skin Penetration	Products:		
Autoject® 2 (Owen Mumford)	Spring-loaded plastic syringe holder positioned over skin. Press device against site, push button to insert needle automatically without seeing the needle penetrate the skin to deliver the dose.	Abbott Labs, MediSense 1cc and 1/2cc, BD 1cc and 1/2cc	No	Yes	BD Magni-Guide™ (BD), Insul-eze (Palco Labs), Syringe Magnifier (Apothecary Products, Inc.), Tru-Hand (Whittier Medical)		
BD™ INJECT-EASE® Automatic Injector (BD)	Spring-loaded plastic syringe holder positioned over skin. Press button to insert needle. Insulin is injected manually.	BD Micro-Fine IV and Ultrafine 1cc, 1/2cc, and 3/10cc syringes	No	Yes	<b>NON-VISUAL INSULIN MEASUREMENT</b>		
Instaject (Medicoool, Inc.)	Combination syringe injector and blood lancet device.	Most 1cc, 1/2cc, and 3/10cc syringes (does not fit Monoject syringes)	No	Yes	Count-a-Dose (Medicoool, Inc.)	Syringe-filling device. Empty syringe secured in easy-to-locate platform, slide moves syringe plunger to control insulin intake. Click wheel activates slide to ensure accurate dosage in 1-unit increments. Click heard and felt as wheel is rotated. Holds 1-2 bottles of insulin for mixed doses. Use with BD U-100, 1/2cc Lo-Dose syringe.	Available from Medicoool, Inc. and Science Products
INJECT-EASE® (Palco Labs)	Spring-loaded plastic syringe positioned over skin. Press button to insert needle.	Designed from BD 1cc, 1/2cc, and 3/10cc syringes	No	Yes	<b>NEEDLE GUIDES AND VIAL STABILIZERS</b>		
NeedleAid™ (NeedleAid, Ltd.)	Stabilizing guide for injection using an insulin pen or syringe. Broad base hides the needle, masks the sensation of needle entry, provides safety as needle is automatically withdrawn, and ensures injection at the proper angle and depth. Insulin is injected manually.	NovoPen 3, 1.5, Junior, Novo Nordisk disposable pens, Lilly insulin pens, most 1cc, 1/2cc, and 3/10cc syringes	No	No	Holdease (Meditec, Inc.)	Needle guide and syringe/vial holder. Unit holds syringe and insulin together in easy-to-handle unit while user fills syringe.	Available online and from local pharmacies
					Inject Assist™ (Apothecary Products, Inc.)	Holds syringe and insulin bottle steady as syringe is filled. Pre-set dosage guide for accuracy. Holds U-100, U-80 and U-40 syringes.	Available from Apothecary Products, Inc. and local pharmacies
					Injection Safety Guard™ (Apothecary Products, Inc.)	Protects hands from accidental injection. Fits over the top of insulin vial, allowing user to place hands underneath safety guard and begin filling the syringe.	Available from Apothecary Products, Inc. and local pharmacies
					Insul-Cap® (Palco Labs)	Fits on top of insulin bottle allowing user to load syringe with one hand.	Available from local pharmacies or mail order
					<b>VIAL SYRINGE GUIDES</b>		
					Flents Vial & Syringe Guide for Daily Insulin Users (Flents)	Eliminates blunted or broken needles by safely connecting syringe to insulin bottle.	Available online and from local pharmacies



**Basal/Bolus Insulin Delivery**



The above two graphs represent common basal/bolus insulin regimens.

**Figure 1** - A four injection regimen is utilized. Glargine insulin (Lantus®) or insulin detemir (Levemir®) is used for basal insulin needs once daily. In addition, an injection of a rapid acting insulin analog is given with each meal to meet prandial insulin needs.

**Figure 2** - A two injection regimen is depicted. In this dosing strategy a 70/30 mix of isophane/regular insulin is given twice daily. The isophane component provides a long-acting basal insulin level, while the regular insulin component helps with prandial insulin needs around breakfast and dinner.

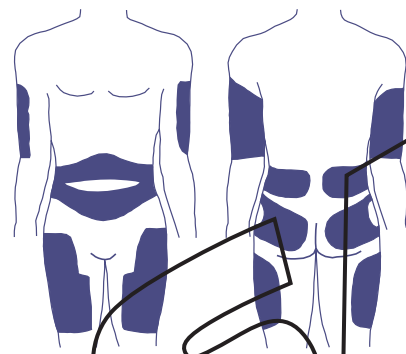
**TREATMENT GOALS FOR DIABETES MELLITUS**

	American Diabetes Association (ADA)	American Association of Clinical Endocrinologists
<b>Target A1C</b>	<7%	<6.5%
<b>Target Fasting Blood Glucose</b>	70-130mg/dL	<110mg/dL
<b>Target Peak Post-Prandial Glucose Levels</b>	<180mg/dL	<140mg/dL

**CATEGORIES OF HYPO- AND HYPERGLYCEMIA AND ASSOCIATED SIGNS AND SYMPTOMS**

Category	Blood Glucose Range	Signs and Symptoms
Mild Hypoglycemia	55-70mg/dL	Irritability, Nervousness, Heart palpitations, Shakiness, Increased heart rate
Moderate Hypoglycemia	40-55mg/dL	Blurred Vision, Changes in mood, Fatigue, Confusion, Slowed reaction time
Severe Hypoglycemia	<40mg/dL	Coma, Convulsions, Seizure, Unconsciousness
Hyperglycemia	Above Goal Levels	Excessive thirst, Excessive hunger, Frequent urination, Fatigue, Blurred vision

**Possible Insulin Injection Sites**



**STEPS FOR SUBCUTANEOUS SELF-INJECTION**

1. Collect injection supplies and inspect the insulin vial for any crystallization, clumping or discoloration. If present, discard the vial and open a new one.
2. Wash your hands with soap and water.
3. Roll the insulin vial between your hands about 10 times. Avoid shaking or excess agitation because it may damage the insulin.
4. Disinfect the top of the insulin vial with an alcohol swab.
5. Pull the plunger down on the insulin syringe to the number of units to be given.
6. Insert the needle into the vial and depress the plunger to inject air into the insulin vial.
7. Pull the plunger down to draw up the desired amount of insulin. Tap the syringe with a finger to move any air bubbles to the top of the syringe and push them out.
8. Once an injection site has been chosen, clean the area with an alcohol swab.
9. Lightly pinch up the skin and insert the insulin needle all the way to the hub at a 90° angle.
10. Depress the plunger to inject the insulin and remove the needle after approximately 5 seconds.
11. Dispose of the needle and syringe in an appropriately labeled container.

**Insulin Card References:**

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