

**Oral Anti Diabetic Agents** Oral meds used if pancreas produces insulin, Typically used in Type 2 diabetes

| Class   | Action   | Side effects  | Nursing considerations  |
|---|--|---|---|
| <b>Second Generation Sulfonylureas</b><br>Glucotrol (glipizide)<br>DiaBeta, Micronase (glyburide)<br>Amaryl (glimepiride)                 | Decrease insulin resistance<br>Stimulate the beta cells to secrete more insulin<br>Onset, peak, duration                 | GI disturbances,<br>Neuro disturbances,<br>skin rash,<br>weight gain initially<br>Hypoglycemia                                    | Hypoglycemia:<br>Give 30 minutes prior to meal<br>Interactions with NSAID's, warfarin, sulfonamides<br><br>Use caution with sulfa allergies<br>Contraindicated in pregnancy |
| <b>Biguanides</b><br>Metformin (Glucophage, Glucophage XL, Fortament)<br>Glucovance- metformin w/ glyburide                               | Increase tissue sensitivity to insulin (decrease resistance & glucose absorb in GI)<br>reduce hepatic glucose production | No hypoglycemia<br>No weight gain<br>GI disturbances,<br>lactic acidosis,<br>headache   | Causes lactic acidosis in dehydrated pt (really watch for if pt ill)<br>Take with meals<br>d/c 48h prior to contrast<br><br>Do not use in impaired renal fxn                |
| <b>Alpha-glucosidase inhibitors</b><br>Acarbose (Precose)<br>Miglitol (Glyset)  | Delay absorption of carbs (by preventing breakdown of them in GI tract)<br>Smaller rise in BG after meals                | GI disturbances,<br>rash,<br>NO wt gain,<br>NO hypoglycemia   | Give before meals with the first bite of food<br>Most effective when taken w/ high fiber diet<br>Contraindicated: GI dysfunction<br>Hold dose if client is NPO or fasting   |
| <b>Non-Sulfonylurea Insulin Sectetagogues</b><br>Meglitinides: Prandin (repaglinide)<br>Starlix (neteglide)                               | Improves insulin action  | Side Effects: GI disturbances,<br>hypoglycemia, cardio effects – HTN, MI<br>Less wt gain than Sulfonylureas                       | Monitor renal & liver function  |
| <b>Thiazolidinediones</b><br>Actos (pioglitazone).<br>Avandia (rosiglitazone)   | Lowers insulin resistance  | Warning: Avandia: ↑MI<br>poss liver toxicity, wt gain,<br>hypoglycemia, hyperlipidemia,<br>increased fractures<br>SIG CV SE & HTN | q3mon LFT   |
| <b>DPP – 4 Inhibitors</b><br>Januvia (sitagliptin) – oral, most common<br>Galvus (vildagliptin) – oral, new<br>Onglyza (saxagliptin – new | increases insulin, decreases liver glucose production  | HA, N/V, hypoglycemia   | S/S hypo  |

| Class  | Action  | Side effects                            | Nursing considerations   |
|--|---|---|--|
| <b>New Anti Diabetic Medications</b><br>Symlin (pramlintide) - sub Q only  | lower postprandial BG, adjunct insulin  | N/V, anorexia, HA, hypoglycemia         | separate SubQ from insulin                                       |
| <b>Incretin Mimetics</b><br>Byetta (exenatidine) – sub Q only<br>Used with sulfonylureas   | Enhances insulin secretion<br>Decreases glucose from liver  | N/V, wt loss, anorexia, NO hypoglycemia | Refrigerate, before meals, not insulin sub                       |
| <b>New Oral Medication</b><br>Cycloset (bromocriptine)<br>FDA approved   | Helps control BG thru brain chemistry - DM2<br>Helps lower post meal BG all day   |   | Low dose, quick acting, once daily, AM                           |
| <b>Combination Anti diabetic Drugs</b><br>Glucovance (metformin + glyburide)<br>Metaglip (glipizide + metformin)<br>Avandamet (rosiglitazone + metformin)<br>Drug companies prefer – increases charges for generic medications | Advantages of combination drug therapy<br>Increases compliance - one pill<br>Cost less<br>Multiple actions of the agents at same time |   |  |
| <b>Hyperglycemic Medications</b><br>Glucagon – hormone from pancreatic islets , alpha<br>Actions of glucagon<br>Side Effects of glucagon<br>Nursing Consider:  | Increases BG – stimulate glycogen from liver<br>Treats insulin induced hypoglycemia<br>BG increase 5-20 min after administration      | : N /V, low BP. , allergy               | admin SubQ, IV, IM; use insulin shock, emergency kit, monitor BG |

**Insulin Therapy** Insulin is a hormone & a protein , drug of choice to control gestational diabetes & Type 1, Each type has its own: Onset, Peak, Duration

**Classified by types:**

**Rapid acting**

- Onset: 5-15 minutes
- Peak: 30 minutes to 1 hr
- Duration: 2-4 hours
- Indications: Rapid acting insulins are used prior to meals to correct hyperglycemia
- Route: Given only SQ
- Meds: Humalog, Lispro.

**Short acting**

- Onset: 0.5 hour (30 minutes)
- Peak: 2-4 hours
- Duration: 6-8 hours
- Used also for coverage in sliding scale as well for emergency coverage.
- Route: Given SQ, IV
- Meds: Humulin R, Novalin R, Velosulin BR

**Intermediate acting**

- Onset: 1-2 hours
- Peak: 6-12 hours
- Duration: 18-24 hours
- Route: Administered SQ only; has protein derivative within the product that prolongs the insulin. It is therefore cloudy and must be gently rotated to mix..
- Meds: Humulin N, Iletin NPH. Look for N or NPH on the label

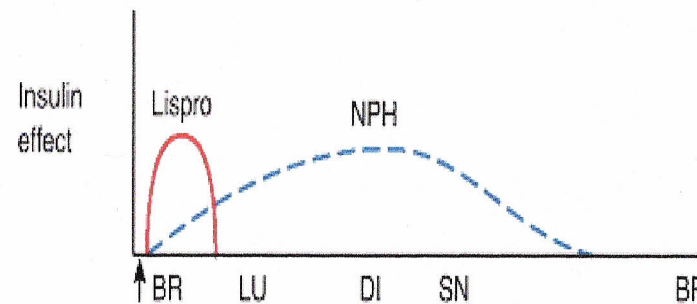
**Long acting, basal**

- Onset: 5-8 hours
- No Peak as this agent is sustained over 24 hours.
- This agent is clear and cannot be mixed with any other insulin.
- It is usually given HS
- Route: only administered SQ
- Meds: Lantus (glargine), Detremir (Levemir)

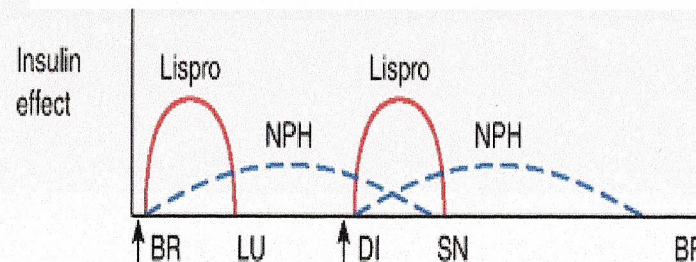
**Combination Insulin**

- These are two types of insulin that are pre-mixed in the same container. They always contain regular and intermediate acting insulin.
- They include: 50/50; 70/30; 75/25
- All are cloudy and need rotating prior to SQ injection (only).

**Combined Insulin Effect: Rapid & Intermediate Acting**



**Combined Insulin Effect: Multiple Injections of Rapid & Intermediate acting**



**Table 41-3 Categories of Insulin**

| Time Course  | Agent  | Onset     | Peak                 | Duration | Indications  |
|--------------|--|-----------|----------------------|----------|--|
| Rapid        | Lispro (Humalog)   | 10–15 min | 1 h                  | 2–4 h    | Used for rapid reduction of glucose level, to treat postprandial hyperglycemia, and/or to prevent nocturnal hypoglycemia |
|              | Aspart (Novolog)   | 5–15 min  | 40–50 min            | 2–4 h    |  |
|              | Glulisine (Apidra)   | 5–15 min  | 30–60 min            | 2 h      |  |
| Short        | Regular (Humalog R, Novolin R, Iletin II Regular)  | ½–1 h     | 2–3 h                | 4–6 h    | Usually administered 20–30 min before a meal; may be taken alone or in combination with longer-acting insulin            |
| Intermediate | NPH (neutral protamine Hagedorn) (Humulin N, Iletin II Lente, Iletin II NPH, Novolin L [Lente], Novolin N [NPH]) | 2–4 h     | 4–12 h               | 16–20 h  | Usually taken after food   |
|              |  | 3–4 h     | 4–12 h               | 16–20 h  |  |
| Very long    | Glargine (Lantus)<br>Detemir (Levemir)   | 1 h       | Continuous (no peak) | 24 h     | Used for basal dose  |

**MIXING INSULIN**

Most commonly mixtures are rapid-acting or short-acting plus NPH or Lente, given in one syringe

Draw up the rapid acting or short-acting first (clear to cloudy).

Insulin should be given within 5 min after mixing to maintain action time.

Maintenance of insulin: may be kept up to 28 days (for most) at room temperature

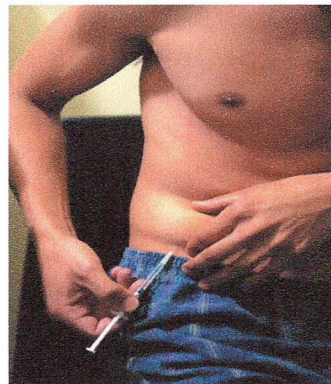
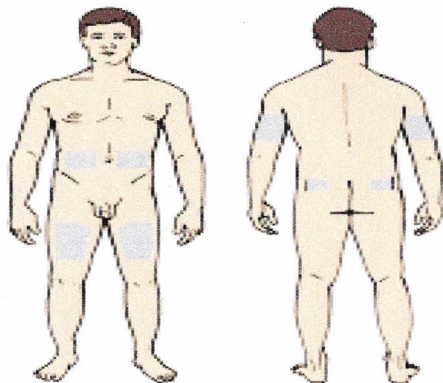
**Insulin Nursing Considerations**

Insulin is used for all types of diabetes.

It can be injected IV, SQ, or placed in a pump for basal administration.

When used SQ, the sites should be “rotated”. Avoids lipodystrophy.

Allergic reactions: itching or red



**NR-RN**

Mixing: Push air Normal then Regular– aspirate rx Regular then Normal  
Inject w/in 5 min so modified N does not bind to regular fast acting R

