

Medications for Diabetes

**Satellite Conference and Live Webcast
Wednesday, November 7, 2012
2:00 – 4:00 p.m. Central Time**

**Produced by the Alabama Department of Public Health
Video Communications and Distance Learning Division**

Faculty

**Anita King, DNP, RN, FNP, CDE, FADE
Clinical Associate Professor
University of South Alabama
Mobile, Alabama**

Objectives

- **Describe types of insulins with properties and side effects**
- **Outline classes of oral agents for diabetes with properties and side effects**
- **Discuss other medications adjunctive with diabetes medications**
- **List safety factors to consider with diabetes medication**

Insulin

- **Always a treatment for Type 1 diabetes**
- **Works by lowering blood glucose**

Insulins: Quick Acting

- **Humalog (Lispro)**
- **Novolog (Aspart, Apidra)**
- **Onset: 10 - 30 minutes**
- **Duration: 3 - 5 hours**
- **Peak: 30 minutes - 1 hour**

Insulins: Short Acting

- **Humulin R**
- **Novulin R**
- **Onset: 30 minutes - 1 hour**
- **Peak: 2 - 5 hours**
- **Duration: Up to 12 hours**

Insulins: Intermediate

- Humulin N (NPH)
- Novulin N (NPH)
- Humulin L (Lente)
- Novulin L (Lente)
- Onset: 1.5 - 4 hours
- Peak: 4 - 12 hours
- Duration: Up to 24 hours

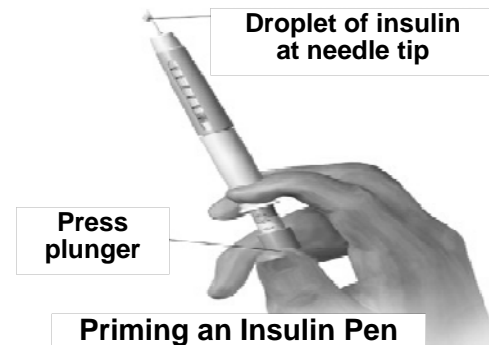
Insulins: Long Acting

- Humulin U (ultralente)
- Lantus (insulin glargine)
- Levimir (Detimir)
- Onset: .8 - 4 hours
- Peak: Minimal
- Duration: Up to 24 hours

Insulin Mixtures

- 2 insulins are premixed
- Humulin 50/50
- Humulin 70/30
- Humalog Mix 75/25
- Novulin 70/30
- Novolog Mix 70/30

Insulin Pens



Where to Inject

- Stomach
 - Stay at least 2 inches from bellybutton or scars
- Thigh
 - Inject about a hands width above the knee and 4 inches down from top of leg

Where to Inject

- Arm
 - Fatty tissue between shoulder and elbow
- Buttock
 - Inject into wallet area and avoid lower buttock

Insulin Side Effects

- Hypoglycemia
 - Low blood sugar
 - Under 60 mg
- Weight gain
- Allergic reaction (rare)

Patient Safety

- Inform physician of any over the counter medications, supplements, or natural remedies you are taking
- Rotate injection sites
- Avoid excessive massage of injection site
- Exercise of arms or legs will increase absorption of insulin

Oral Agents: Sulfonylureas

- Cause the pancreas to make more insulin
- Side effect:
 - Low blood glucose

Oral Agents: Sulfonylureas

Brand Name	Generic Name
Amaryl	Glimepiride
Glucotrol	Glipizide
Diabeta	Glucotorl XL
Glynase PreTab	Glyburide
Micronase	Glyburide

Patient Teaching

- Take on regular schedule with meals
- Always carry a food source in case of hypoglycemia

Oral Agents: Meglitinide

- Cause the pancreas to make more insulin and act more quickly
- Side effects:
 - Low blood glucose (rare)
- Take with meals

Oral Agents: Meglitinide

Brand	Generic
Prandin	Repaglinide
Starlix	Nateglinide

Biguanide

- Reduce amount of glucose made by liver and helps body better use insulin
- Side effects
 - Nausea, diarrhea, gas, loss of appetite

Biguanide

Brand	Generic
Metformin	Glucophage
Metformin XR	Glucophage XR

Patient Education: Biguanides

- Take with food to minimize nausea
- Drug must be stopped before any dye procedure or surgical procedure
- Physician will monitor renal and liver function for any abnormalities
 - Rare risk of lactic acidosis

Thiazolidinedione (TZD)

- Help body cells better use insulin and reduce amount of glucose made by liver
- Do not give to any patient with bladder cancer
- Side effects
 - Liver damage, fluid retention, decrease how some birth control pills work

Thiazolidinedione (TZD)

Brand Name	Generic Name
Actos	Pioglitazone

Patient Education: TZD's

- Side effect of fluid retention
- Increased risk of congestive heart failure
- Report symptoms of nausea, vomiting, fatigue, loss of appetite, shortness of breath, severe edema, or dark urine

Alpha-Glucosidase Inhibitors

- Help keep blood sugar in target range after a meal
- Side effects
 - Gas, bloating, diarrhea, stomach pain
- Take with meals

Alpha-Glucosidase Inhibitors

Brand Name	Generic Name
Precose	Acarbose
Glyset	Miglitol

DPP-4 Inhibitors

- Dipeptidyl Peptidase IV Inhibitors
 - Affects DPP-4 natural body system called incretins which regulate beta cells

DPP-4 Inhibitors

Brand Name	Generic Name
Januvia	Sitagliptin
Onglyza	Saxagliptin
Tradgenta	Linagliptin

Patient Education: DPP-4 Inhibitors

- Side effects:
 - Stomach discomfort, diarrhea, sore throat, stuffy nose, upper respiratory infection
- Report side effects that do not go away
- Take medicine as scheduled

Oral Agents: Combinations

- Combined and sold as one pill
 - Action based on two drugs that are combined
- Side effects
 - Very few

Oral Agents: Combinations

Brand Name	Generic Name
Glucovance	Glyburide and Metformin
Metaglip	Glipizide and Metformin
Janumet	Sitagliptin and Metformin

Incretin Mimetics

- Enhances glucose-dependent insulin secretion and several other antihyperglycemic actions
- Injectable
- For Type 2 diabetes
- Helps weight loss

Incretin Mimetics

Brand Name	Generic Name
Byetta	Exenatide
Victoza	Liraglutide

Non-insulin Synthetic Analog

- Synthetic analog of human amylin, a naturally occurring in beta cells
 - Will result in a reduction in amount of insulin needed
- Injectable
- Type 1 or Type 2 diabetes
- With meals
- Side effects: nausea, hypoglycemia

Non-insulin Synthetic Analog

Brand Name	Generic Name
Symlin	Pramlintide

Patient Education

- **Teach:**
 - Drugs are adjunct
 - Lifestyle is very important
 - Do not skip drugs without physician permission
 - Monitor blood glucose
 - Avoid alcohol

Patient Education

- Do not use herbals without physician permission
- Report side effects to physician

Safety Precautions

- Avoid use of abbreviations
- Request pharmacy to use Spanish in medication instructions
- Request that patient bring medications to each appointment

Patient Safety

- Five rights
- Report errors
- Monitor for adverse effects, interactions
- Check labs carefully
- Have second person verify insulin type and dose

Sources of Errors

- Supplements
 - Interactions
- Medications from other countries
- Insulin
 - Wrong type, dose
- Insulin syringe
 - Poor visualization

Sources of Errors

- Insulin pens and autoinjectors
- Pump programming

Error Types

- Prescribing errors
- Pharmacy errors
- Abbreviations unclear
- Amaryl confused with Reminyl
 - Alzheimer medication

LASA

- Look Alike, Sound Alike
 - Medications, dosage errors, interactions

Safety Actions

- Pharmacy: tallman lettering

Nurse's Role to Monitor

- Laboratory data:
 - Blood glucose / Hgb. A1C
 - Electrolytes
 - Renal and liver function
 - Lipid levels
- Blood pressure

Nurse's Role to Monitor

- Blood pressure
- Signs and symptoms of complications
- Adverse effects of medication
 - Polypharmacy
- Adherence

Summary

- Nurses at every level of healthcare can be effective educators to the person with diabetes