

Diabetes Injectable Pharmacology

University of Hawai'i Hilo Pre-Nursing Program

NURS 203 - General Pharmacology

Danita Narciso Pharm D

Learning Objectives

- ▶ Please see “Oral” diabetic medications

Injectable Medications

- ▶ Amylin analogues
- ▶ Incretin mimetics
- ▶ Insulin
 - ▶ Rapid
 - ▶ Short
 - ▶ Intermediate
 - ▶ Long

Amylin Analogues

- ▶ Amylin (endogenous)
 - ▶ Also released by the beta cells of the pancreas
 - ▶ Slows gastric emptying & promotes satiety
 - ▶ Prandial glucose
 - ▶ Inhibits glucagon secretion
 - ▶ Enhances insulin sensitivity

Amylin Analogues

- ▶ Pramlintide
- ▶ Kinetics
 - ▶ Onset: Rapid
 - ▶ Duration 3 hours
 - ▶ Peak 20 minutes
 - ▶ Dosing: Take prior to meals and should not be administered with insulin (severe hypoglycemia)
 - ▶ Sub Q injection
 - ▶ Reduce post prandial (short-acting insulin) by 50%

BLACK BOX WARNING
SEVERE HYPOGLYCEMIA

Amylin Analogues

- ▶ ADRs:
 - ▶ Nausea
 - ▶ Vomiting
 - ▶ Diarrhea
 - ▶ Anorexia
- ▶ Drug interactions
 - ▶ Insulin (already addresses - dose adjustment)
 - ▶ Anticholinergic drugs (increase in constipation)

Incretin Mimetics

▶ Incretins

▶ Hormones in the body that:

- ▶ Stimulates insulin secretion in response to meals
- ▶ Inhibits glucagon secretion
- ▶ Inhibits gastric emptying - makes you feel full (causes satiety)
- ▶ VERY SHORT HALF LIFE - 2 MINUTES

So we found a way to
make them last longer

Incretin Mimetics

Exenatide (Byetta)

- ▶ Sub Q
 - ▶ BID or weekly
- ▶ Half life: 2-4 hours
- ▶ Not recommended in end-stage renal disease (ESRD)
- ▶ ADR: Hypersensitivity, GI effects, thyroid tumor, pancreatitis, weight loss
- ▶ BBW - some thyroid cancers

Liraglutide (Victoza)

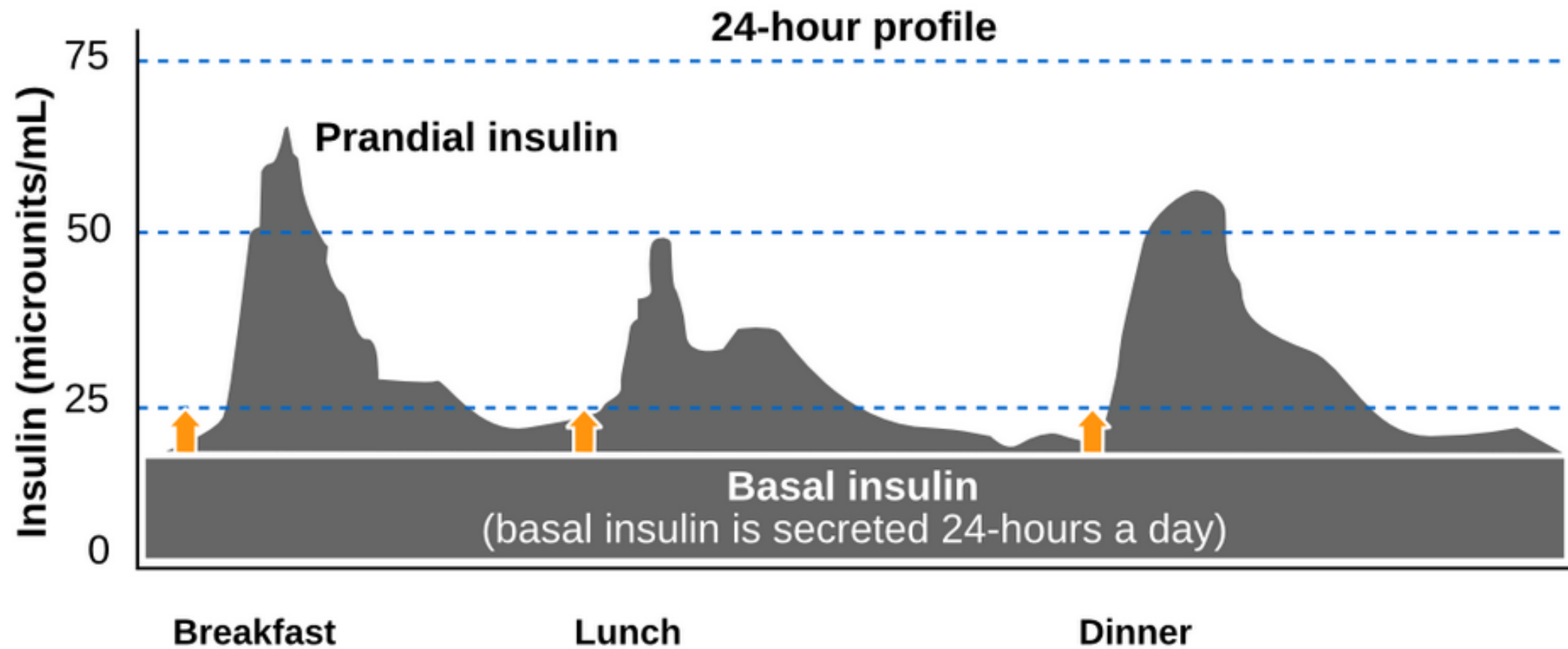
- ▶ Sub Q
 - ▶ Daily
- ▶ Half life: 11-15 hours
- ▶ Ok in (ESRD)
- ▶ ADR: Hypersensitivity, GI effects, thyroid tumor, pancreatitis, weight loss, cardiac effects
- ▶ BBW - some thyroid cancers

Preparing for Insulin

- ▶ Basal: Forming or belonging to a bottom layer or base
 - ▶ For our purposes: Baseline quantity - how much needed to cover daily bodily functions without consideration of food
- ▶ Bolus: Single dose of a drug or medical preparation given all at once
- ▶ Basal/bolus: A **basal-bolus** routine involves taking a longer acting form of **insulin** to keep blood glucose levels stable through periods of fasting and separate injections of shorter acting **insulin** to prevent rises in blood glucose levels resulting from meals.
- ▶ Conversion of lbs. to kg - 2.2 lbs. / kg
- ▶ Calculate insulin doses - will be on exam
 - ▶ Chapter 6 in calculations book

Insulin

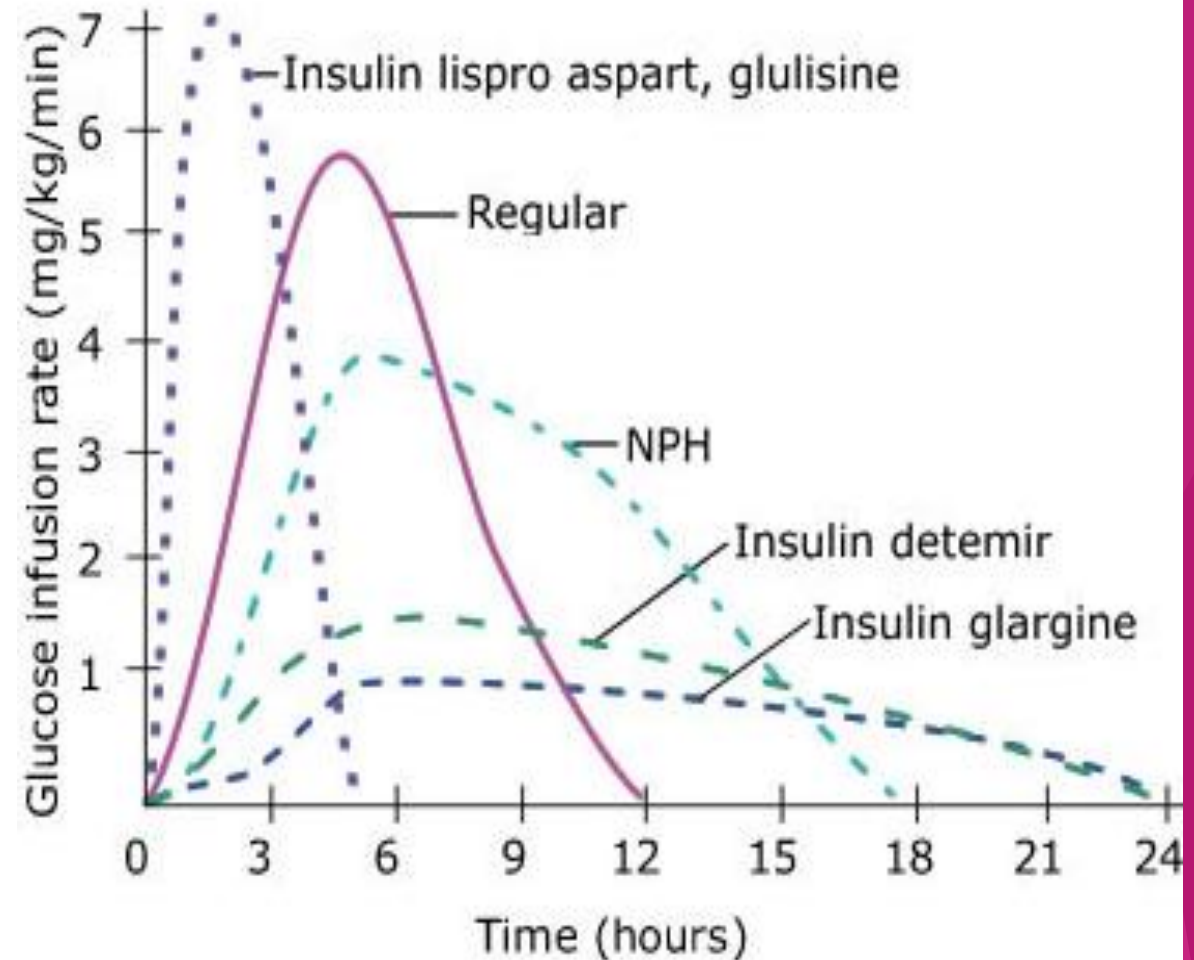
Endogenous insulin secretion



Insulin

- ▶ Rapid acting
 - ▶ Lispro (Humalog)
 - ▶ Aspart (Novolog)
 - ▶ Glulisine (Apidra)
- ▶ Short (insulin regular) acting
 - ▶ Humulin R
 - ▶ Novolin R
- ▶ Intermediate (Isophane Insulin) acting
 - ▶ NPH (neutral protamine hagedorn)
 - ▶ Humulin N
 - ▶ Novolin N
- ▶ Long acting
 - ▶ Glargine (Lantus)
 - ▶ Detemir (Levimir)

Activity Profiles of Different Types of Insulin



Rapid acting - lispro, aspart, & glulisine

- ▶ Administration
 - ▶ Taken just before meals to work on prandial hyperglycemia
- ▶ Onset
 - ▶ 5-10 minutes
- ▶ Duration
 - ▶ 1-3 hours
- ▶ Peak
 - ▶ 30-60 minutes

Short acting - Insulin regular (Humulin R & Novolin R)

- ▶ Administration
 - ▶ May be taken in the evening, coverage during sleep, or basal during day
- ▶ Onset
 - ▶ 30-60 minutes
- ▶ Duration
 - ▶ 10 hours
- ▶ Peak
 - ▶ 3-5 hours

Intermediate Acting - NPH (Humulin N & Novolin N)

- ▶ Administration
 - ▶ May be taken in the evening, coverage during sleep, or basal during day
- ▶ Onset
 - ▶ 1-2 hours
- ▶ Duration
 - ▶ 10 hours
- ▶ Peak
 - ▶ 4-12 hours



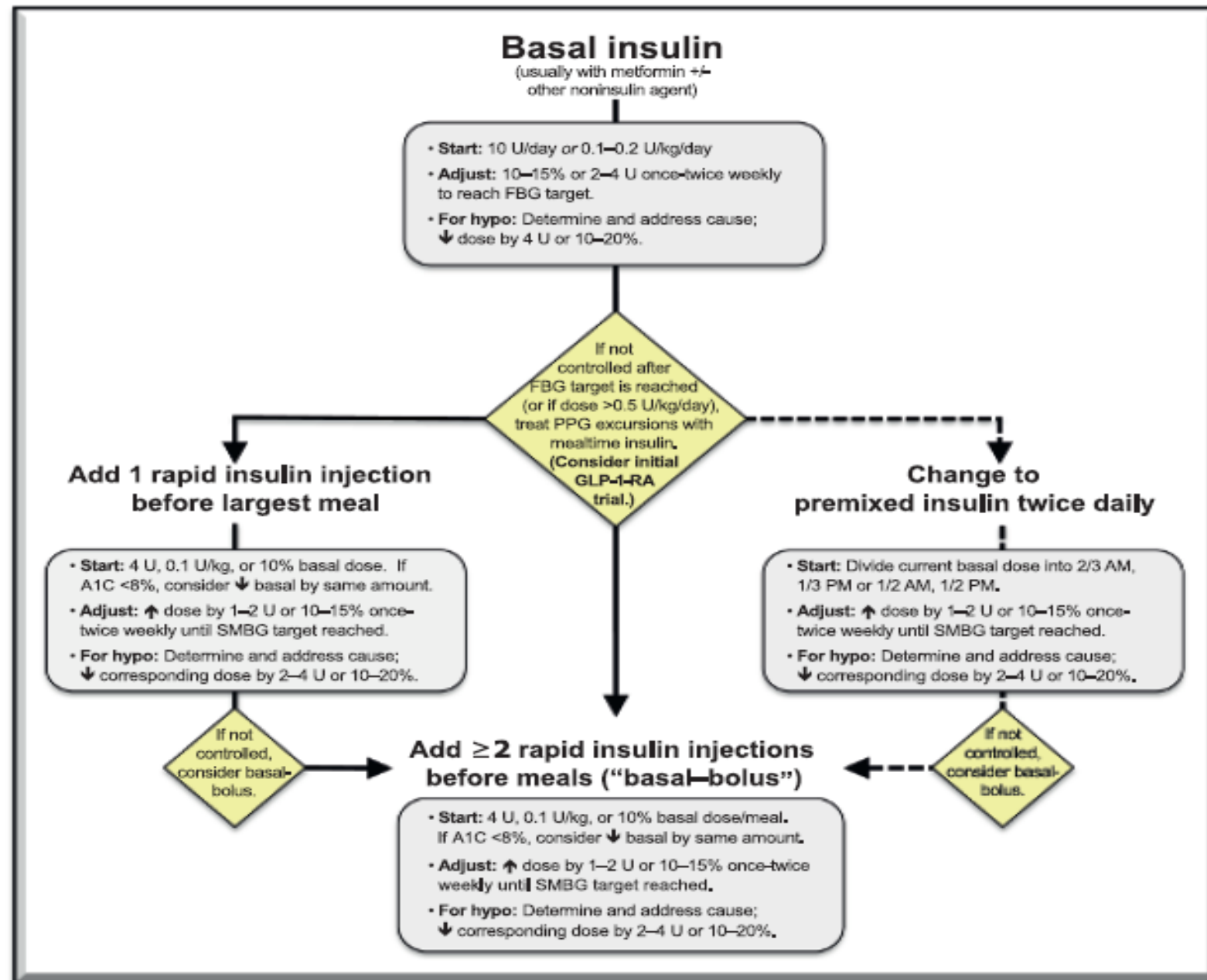
Cloudy

Long acting - glargine & detemir

- ▶ Administration
 - ▶ Taken daily or BID for basal insulin coverage
- ▶ Onset
 - ▶ 3-4 hours
- ▶ Duration
 - ▶ 24 hours
- ▶ Peak
 - ▶ Detemir (3-9 hours)
 - ▶ Glargine (peakless - small peak)

Insulin

- ▶ ADRs (all)
 - ▶ HYPOGLYCEMIA
 - ▶ Lipodistrophy
 - ▶ Resistance
 - ▶ Allergy
 - ▶ Hypokalemia



Questions

