

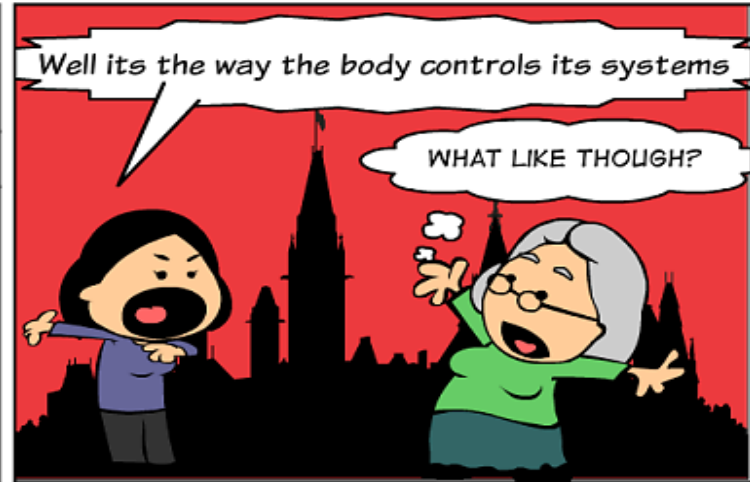
How Does Body Maintain Normal Blood Sugar?

Insulin Resistance and Its Consequences

Sidika E. Karakas, M.D

Professor and Chief

Division of Endocrinology, Diabetes and
Metabolism

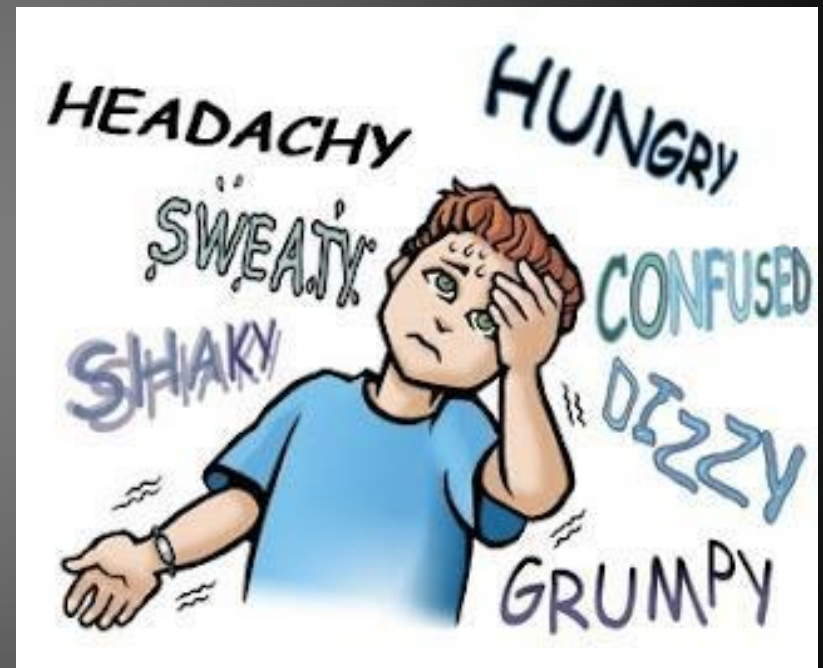


KEEP
CALM
AND
MAINTAIN A
RELATIVELY
STABLE INTERNAL
ENVIRONMENT
DESPITE A CHANGING
EXTERNAL
ENVIRONMENT

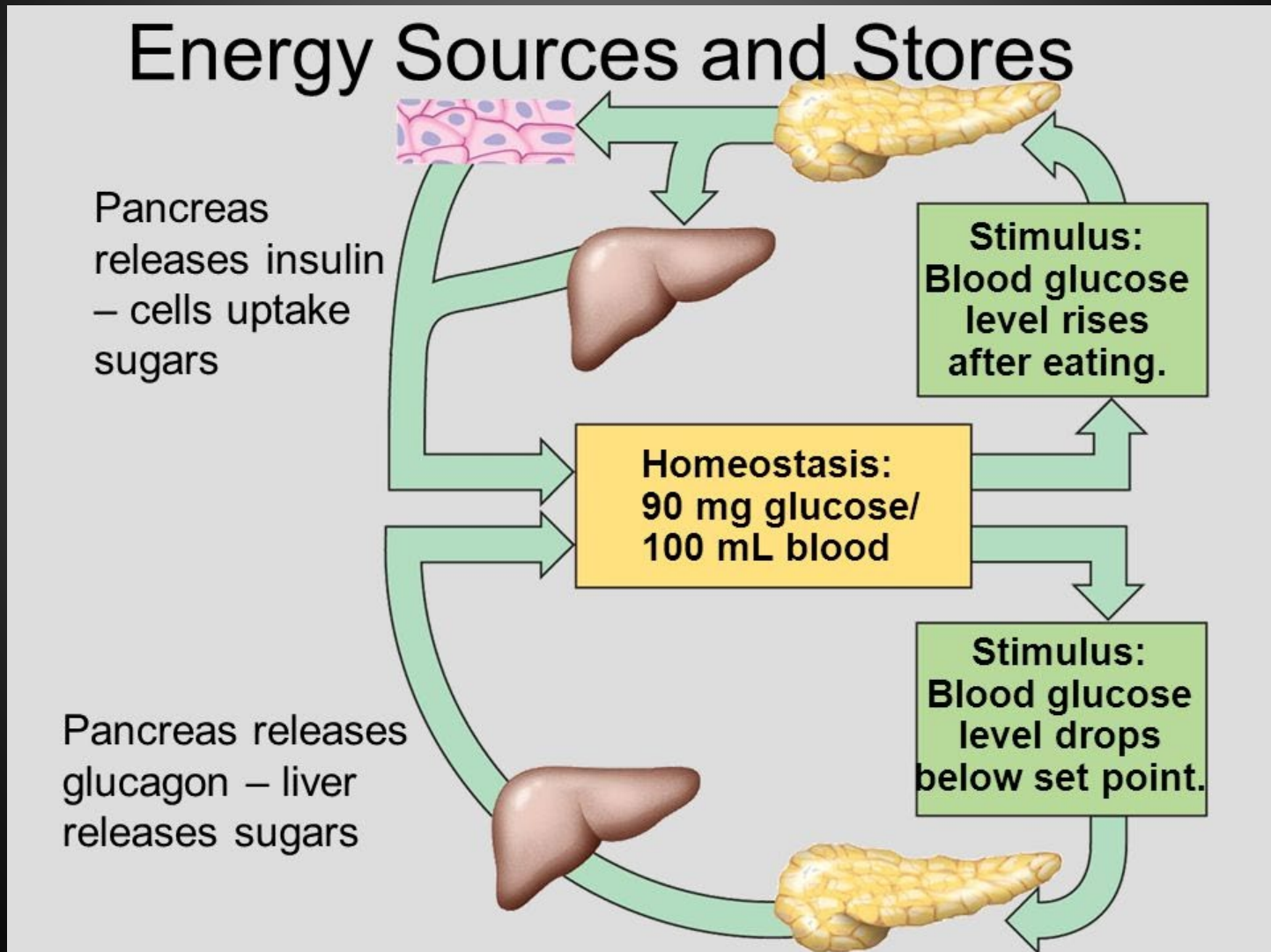
Symptoms of High Sugar (Diabetes)



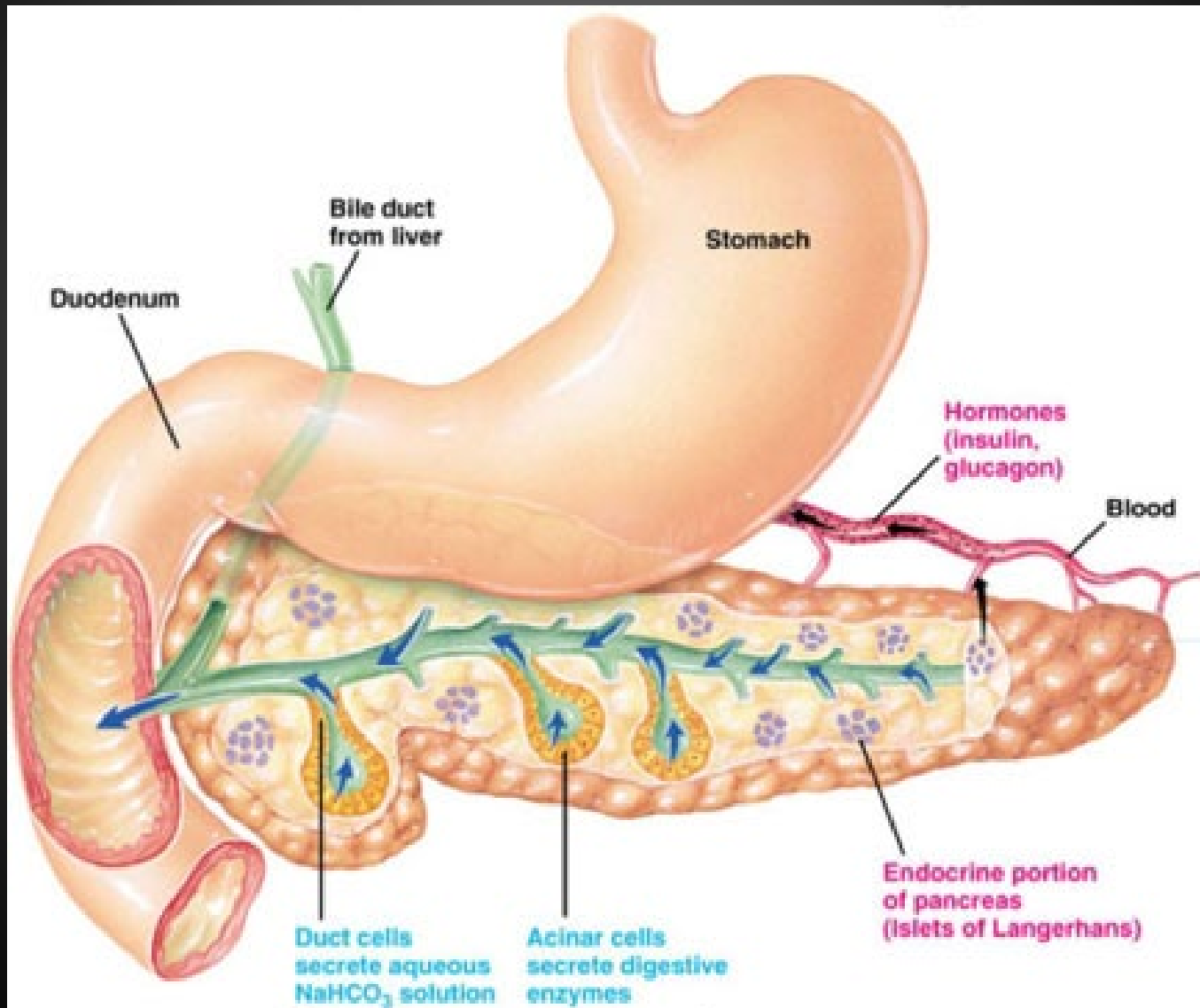
Symptoms of Low Sugar (Hypoglycemia)



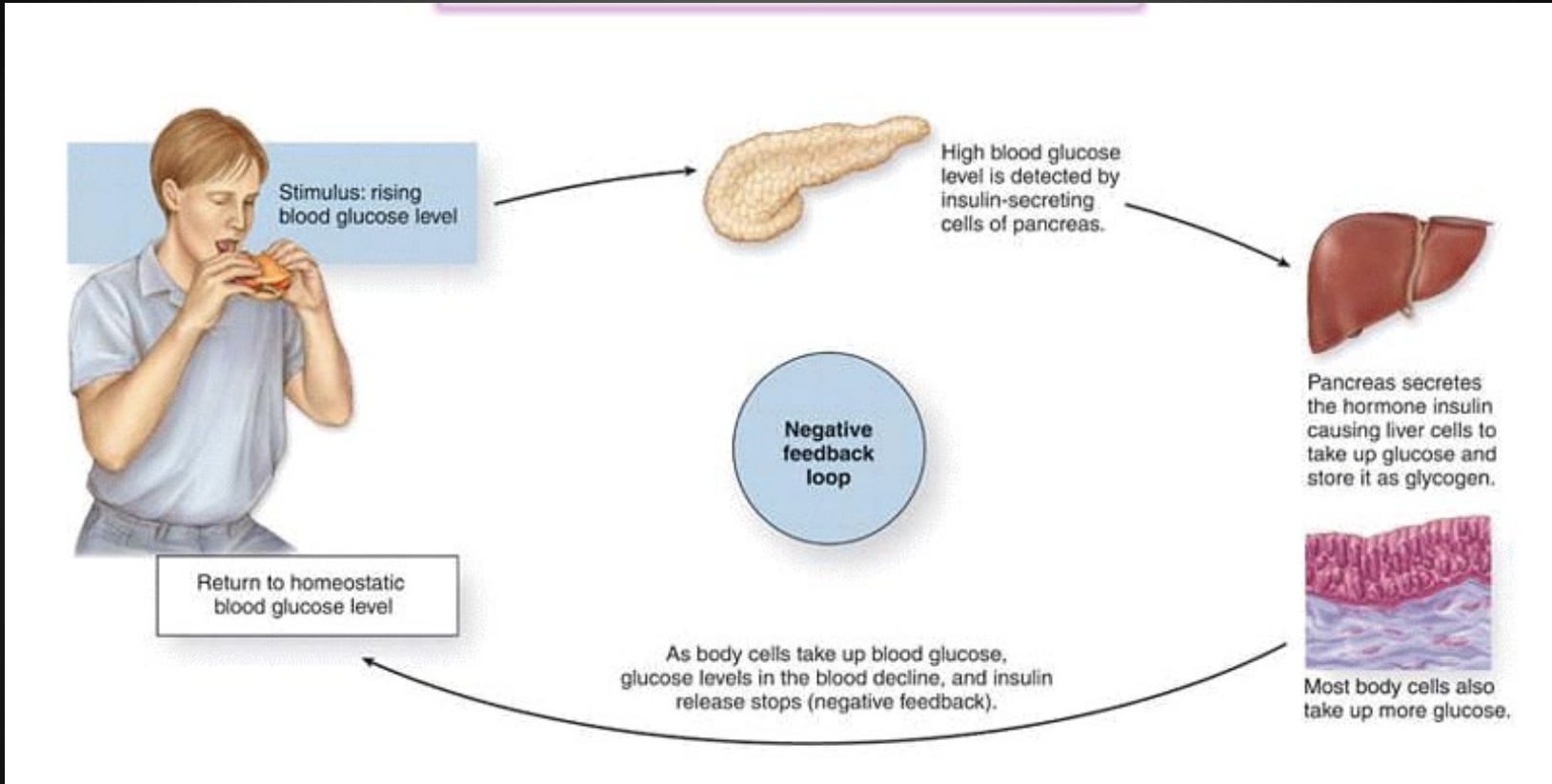
Blood Sugar Homeostasis



Pancreas



Amount of Insulin We Need Depends on What We Eat



Meals containing sugars and simple carbohydrates require more insulin

Amount of Insulin We Need also Depends on Our Body

Presentation of Insulin Resistance



Blood Sugar: 80

80

Insulin: 10

30

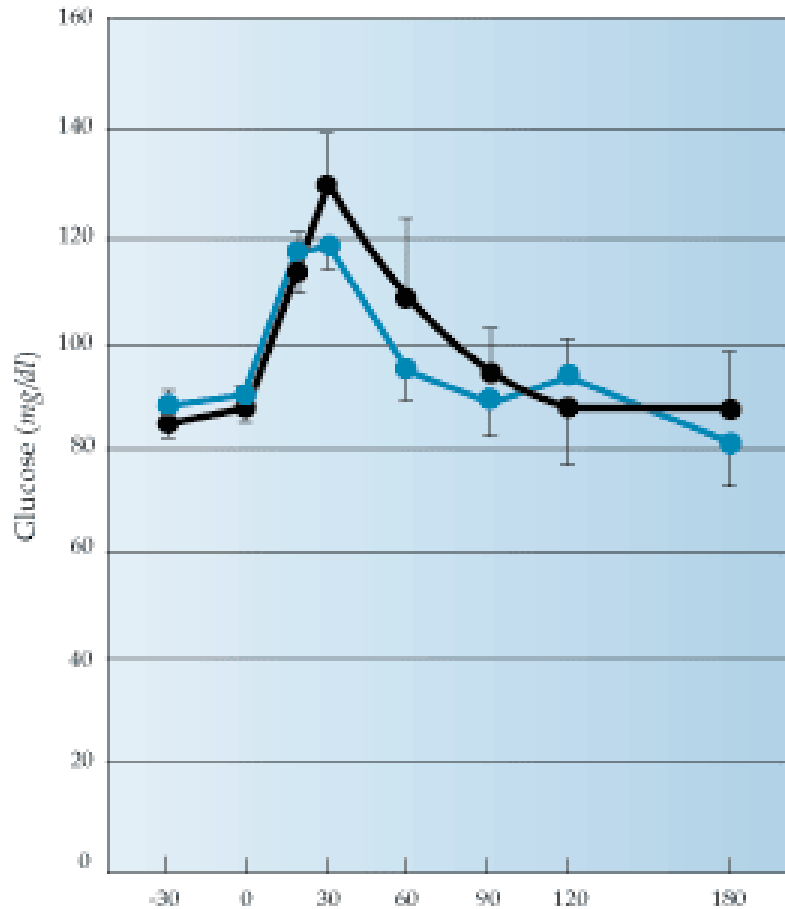
Larger the Waistline Higher the Need for Insulin (Insulin Resistance)



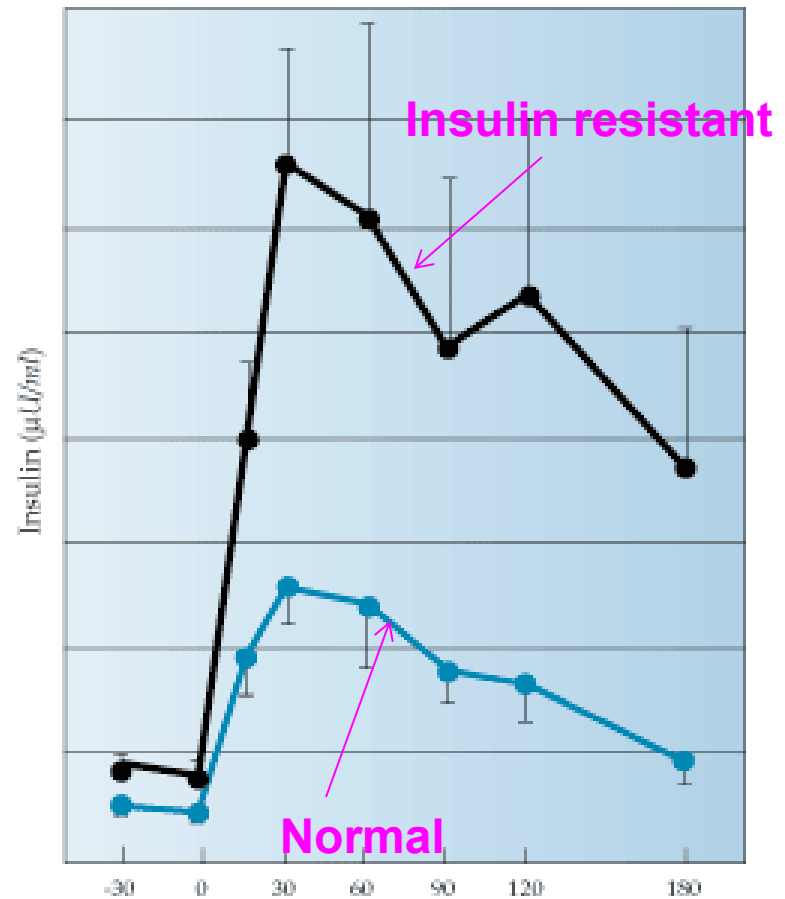
Skin Signs of Insulin Resistance



Insulin Response to Sugar Intake



PCO Normal



PCO Normal

INSULIN RESISTANCE



NEED for EXCESS INSULIN



PANCREAS FATIGUE



TYPE 2 DIABETES

Common Cause of Insulin Resistance in Females: PCOS



Insulin Resistance



Cysts in the Ovaries

Polycystic Ovary Syndrome (PCOS)

- Most common endocrine condition in women
- Affects 1 out of 16 women
 - 8% of AA; 5% of White
- Causes irregular periods
- Excess facial or body hair

Menstrual cycles are a vital sign

Andrea Dunaif, MD.

What is normal?

- More than 35 days in between two periods is considered “too long”
- One year after having their first period, 65% of adolescents have more than 10 periods / year
- Three years after, more than 90% have >10 menses /year

Difficulty in getting pregnant

Excess Hair

Weight gain

Acanthosis

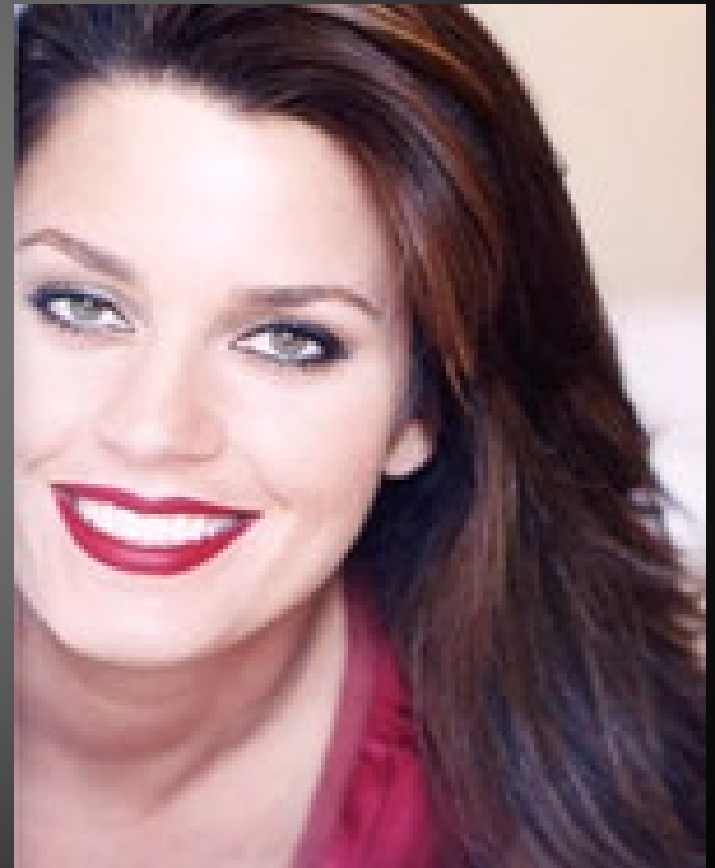
Infrequent periods



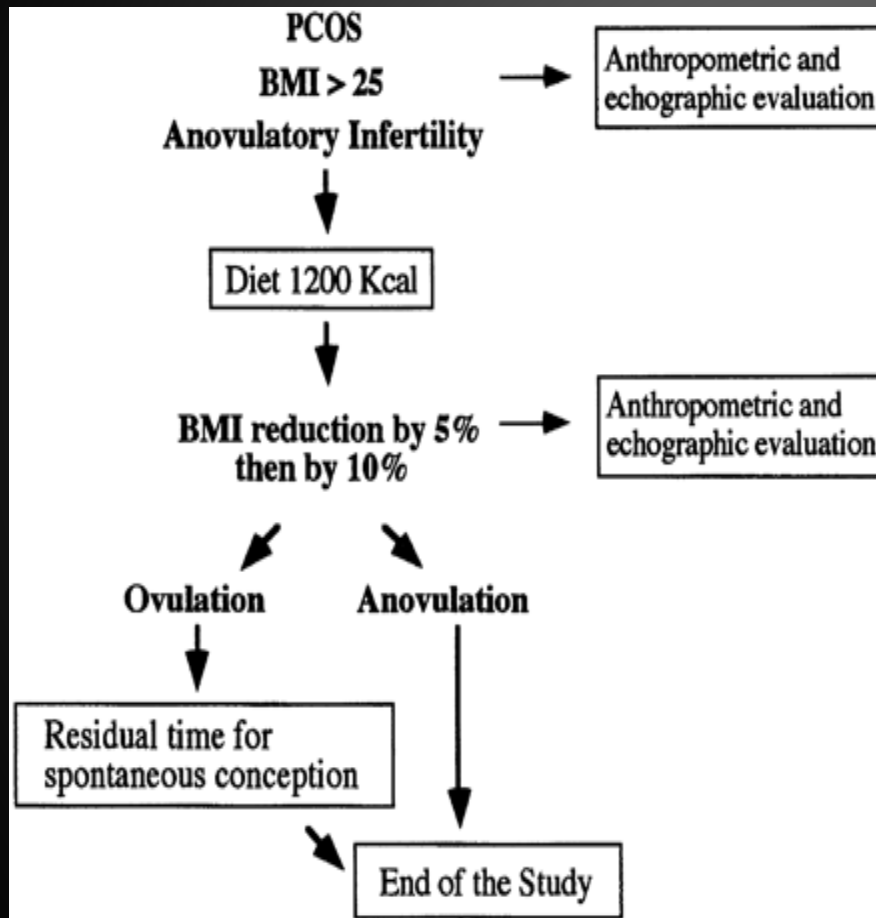
What can we do about it

- We can do a lot
 - Weight control
 - Insulin sensitizers (metformin)
 - Medicines for acne, facial hair and body hair

Clinical Findings of PCOS

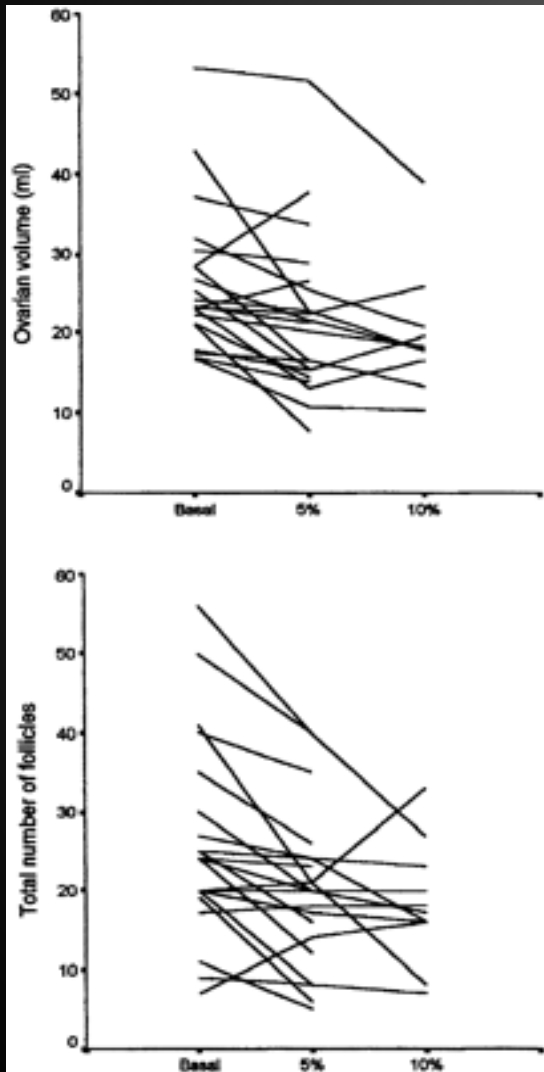


Effects of Weight Loss on Fertility



- 33 PCOS patients
- 25 lost 5% weight
- 11 of these lost >10%
- 15 women ovulated
- 10 became pregnant

Cysts in the ovaries decreased with weight loss



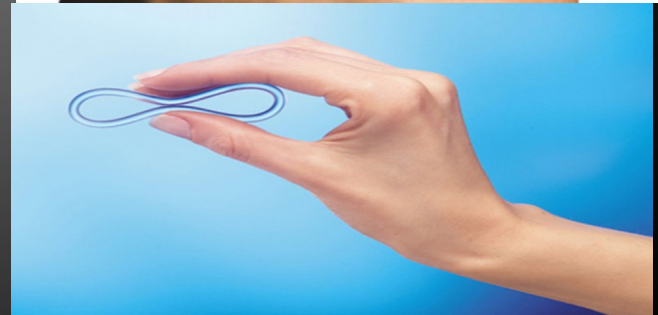
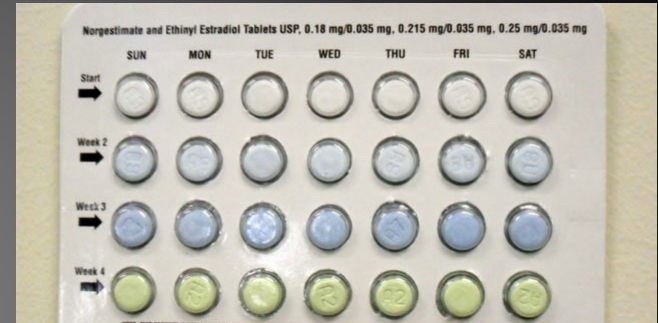
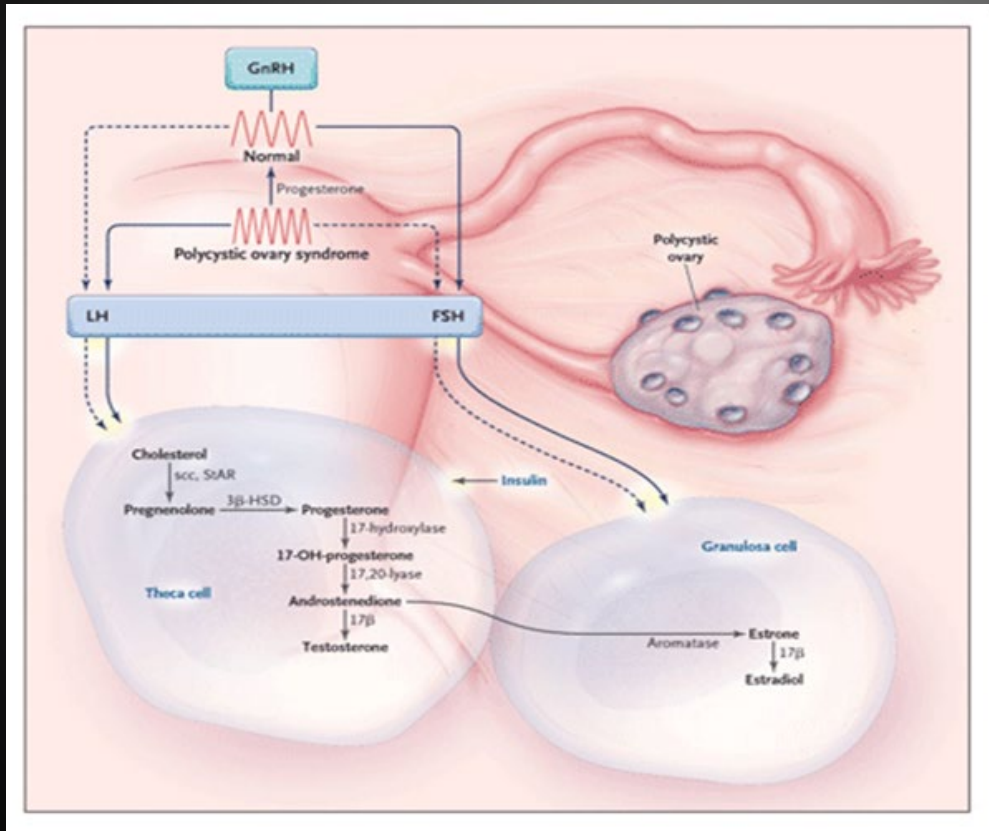
- Ovarian volume decreased by 18% with 5% weight loss
25% with 10% weight loss
- Follicle number decreased from 23.5 ± 11.5 to 19.9 ± 9.9 with 5%,
to 18.3 ± 7.5 with 10% weight loss

Healthy Ways to Decrease Insulin Resistance

- Decrease simple sugar intake
 - DO NOT DRINK SWEETENED DRINKS
- Don't overeat
- Walk, do sports
 - 150 min/wk to maintain weight
 - 250 min/wk to lose weight
- Talk to your parents and doctor
 - If you don't have monthly periods
 - If you are getting excess hair

Treatment of Facial Hair

Suppress ovarian androgen production –contraceptives



Treatment of Facial Hair

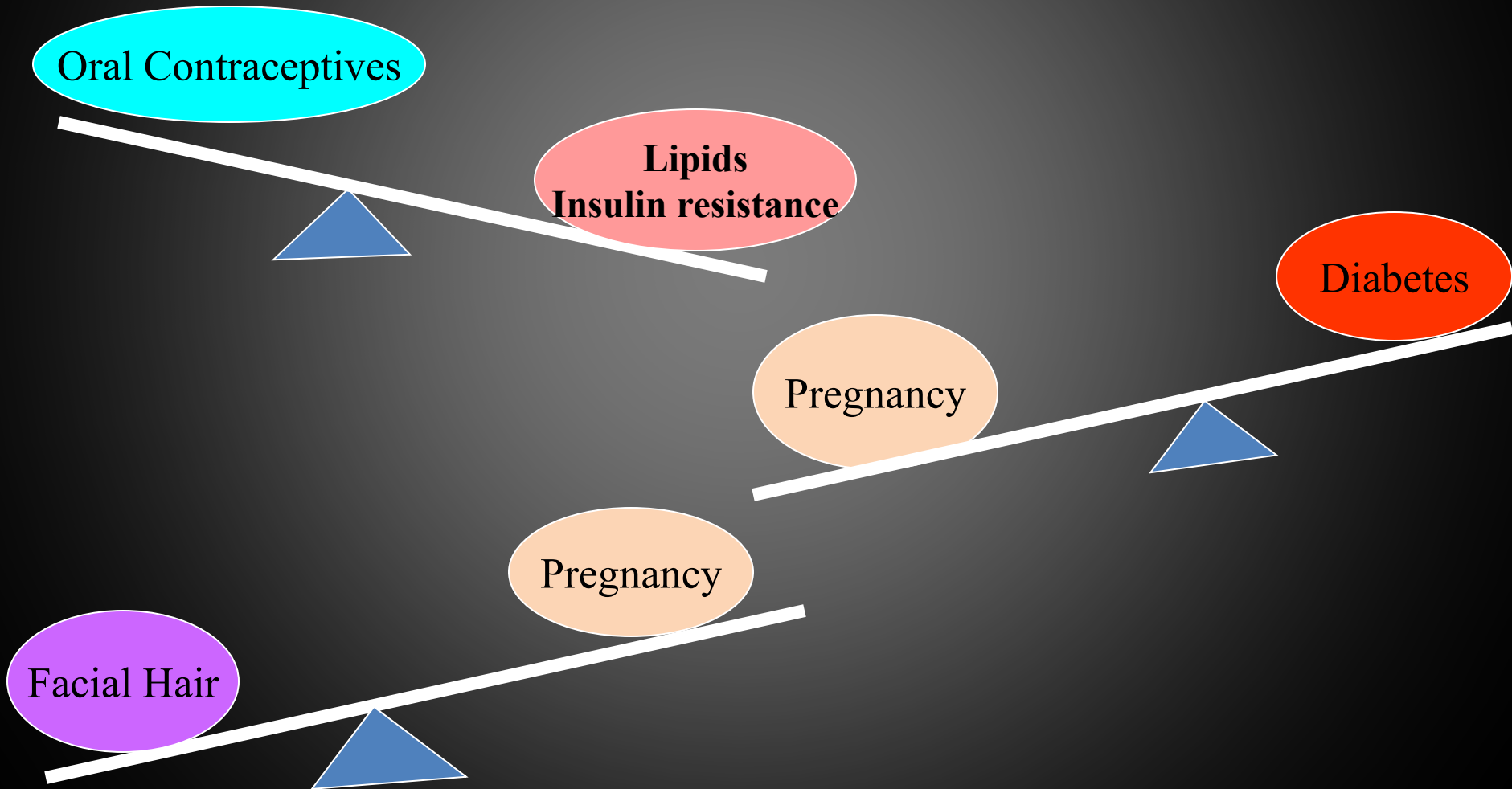
Block androgen receptor
(spironolactone)



Block conversion of
testosterone to DHT
(finasteride)



Management Planning



Difficulty in getting pregnant

Excess Hair

Weight gain

Acanthosis

Infrequent periods



sekarakas@ucdavis.edu

<https://health.ucdavis.edu/internal-medicine/research/endocrinology/>