

Weight Gain during Menopause— It isn't Just Estrogen!

JAN SCHROEDER, PH. D.
LONG BEACH STATE UNIVERSITY
GARAGE GIRLS FITNESS
2021 IDEA FITNESS LEADER OF THE YEAR AWARD RECIPIENT

Stages of Menopause: WHO and International Menopause Society

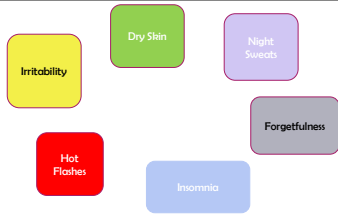
- Pre-menopause**
 - The entire reproductive period up to the final menstrual period
- Perimenopause**
 - Period immediate prior to the menopause (and the first year after menopause)
- Menopause**
 - Natural menopause is recognized to have occurred after 12 consecutive months of amenorrhea, for which there is no other obvious pathological or physiological cause.
- Postmenopause**
 - The period of time after the final menstrual period, regardless of whether the menopause was induced or spontaneous

What Are Hormones?

Chemical messengers



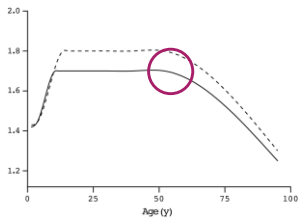
Hormonal Balance



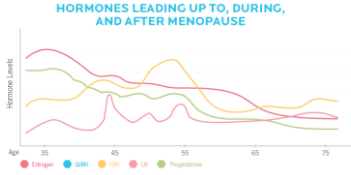
Is Weight Gain Inevitable?

- Age → decrease in energy expenditure
- Menopause → changes in the hormonal environment

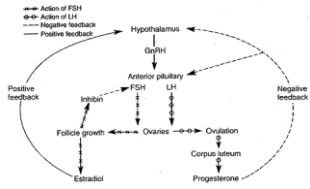
Age → Decrease in Energy Expenditure



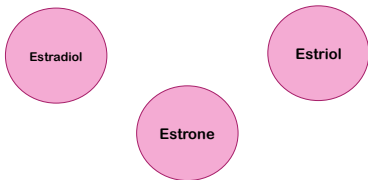
Menopause → Hormonal Environment



Hypothalamic – Pituitary – Ovarian Feedback



Estrogen



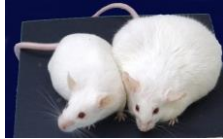
Age versus Estrogen

Energy Expenditure and Estrogen Decreased....Weight Increased (intra-abdominal fat)

Estrogen Deficiency and Weight Gain

Central Effects

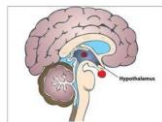
Peripheral Effects



Estrogen and Central Effects

Estrogen has a negative effect of feeding

- Weight gain
- Increased visceral adiposity
- Hyperplasia
- Hyperglycemia
- Impaired energy expenditure

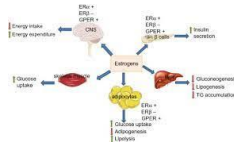


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Estrogen and Peripheral Effects

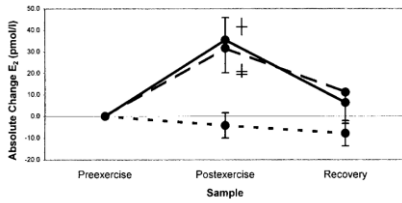
Inhibits adipose deposition by decreasing lipogenesis.

Related to glucose metabolism



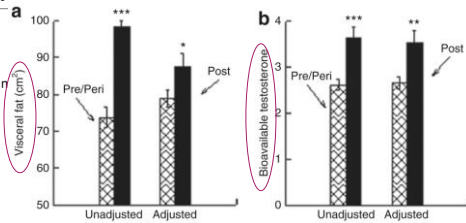
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Estrogen and Exercise

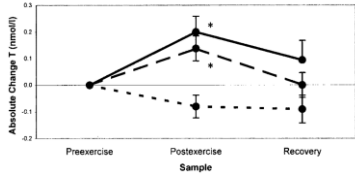


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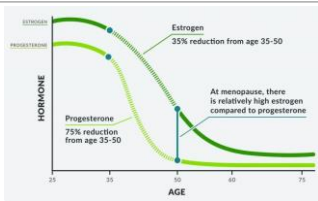
Testosterone



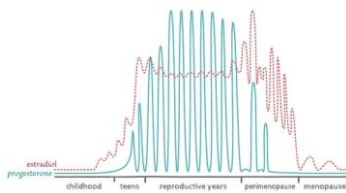
Testosterone and Exercise



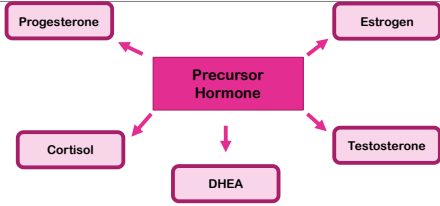
Progesterone



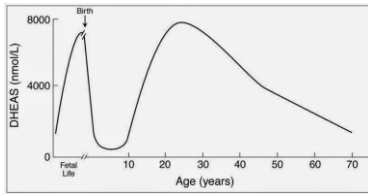
Progesterone and Exercise



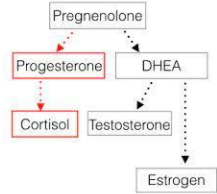
Pregnenolone



DHEA

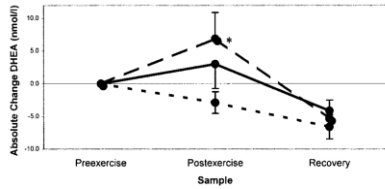


Pregnenolone/DHEA Steal



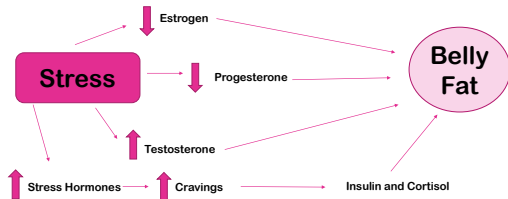
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Pregnenolone/DHEA and Exercise



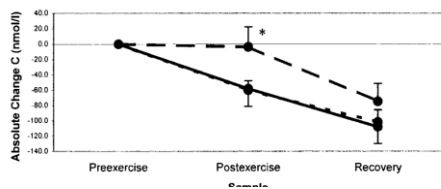
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Cortisol



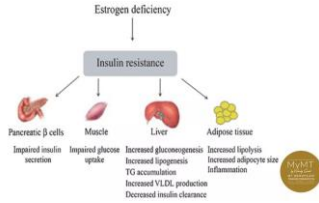
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Cortisol and Exercise



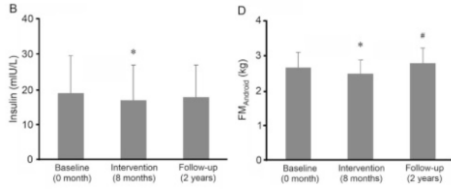
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Insulin



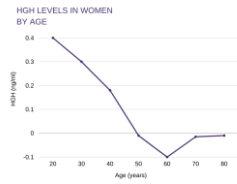
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Insulin and Exercise



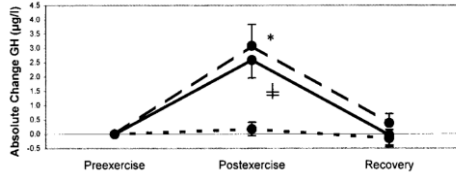
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Human Growth Hormone



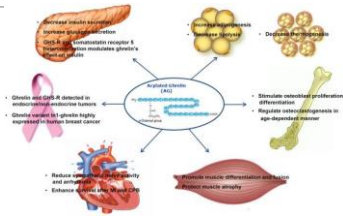
Human Growth Hormone and Exercise

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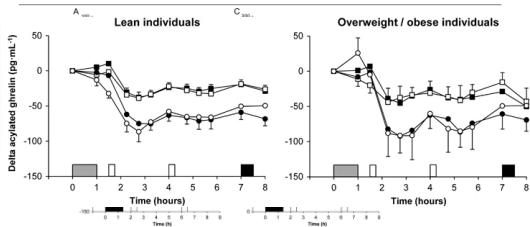
Ghrelin

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Ghrelin and Exercise

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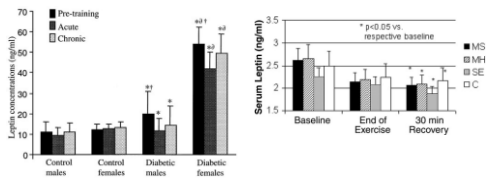
Leptin

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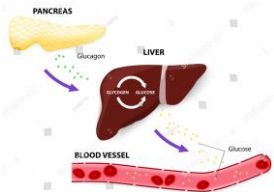
Leptin and Exercise

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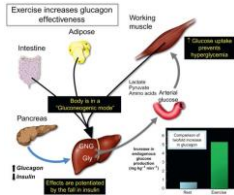
Glucagon

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Glucagon and Exercise



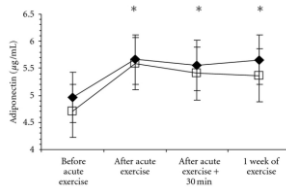
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Adiponectin

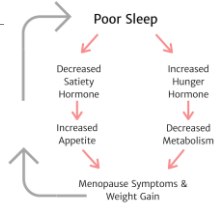
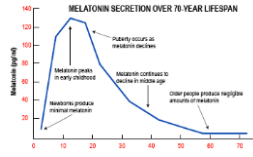
ADIPONECTIN	
Liver	<ul style="list-style-type: none"> ↓ Glycogenolysis; gluconeogenesis ↓ Lipogenesis, triglycerides
Pancrea	↑ Insulin exocytosis
Muscle	<ul style="list-style-type: none"> ↓ Glycogen production ↓ Consumption of glucose ↑ Transport of fatty acid and fatty acid oxidation ↓ Triglycerides
Adipocytes	<ul style="list-style-type: none"> ↑ Consumption of glucose ↑ Triglycerides ↑ Fat storage function of adipocytes

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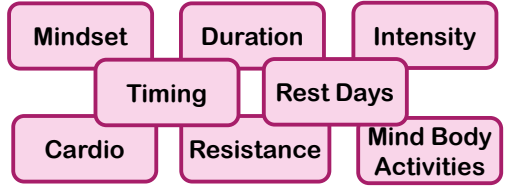
Adiponectin and Exercise



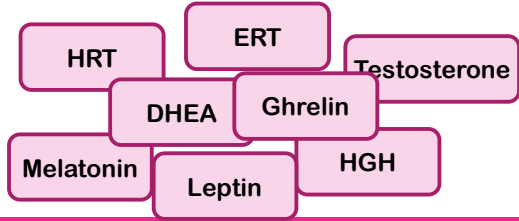
Melatonin



Exercise Recommendations



Pharmaceuticals



Summary

Weight gain is NOT for certain!
Hormones may influence weight gain in clients
Exercise design for weight loss during menopause
is based upon client needs and lifestyle.
