

**Why Obesity is not the problem,
Fat is not the enemy, &
Diet is not the solution!
The Challenge of Treating BED**

NIEAPA

September 18, 2015

1:00 – 4:00

Ralph E Carson, RD, PhD

Executive Director FitRx Brentwood TN

www.FitRxBrentwood.com

What Hassles American's Most Frequently?

(Kanner '81)

“Concerns about weight!”

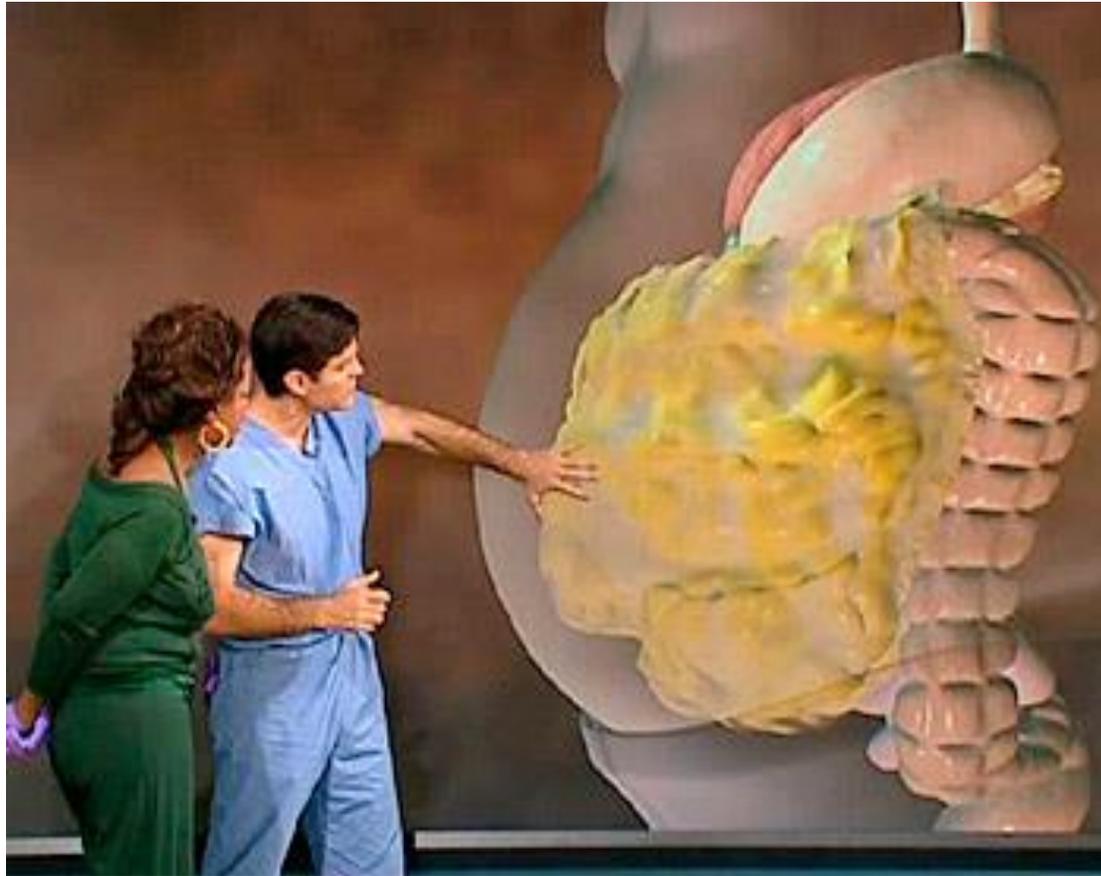


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**Inferior Vena
Cava**

Duodenum

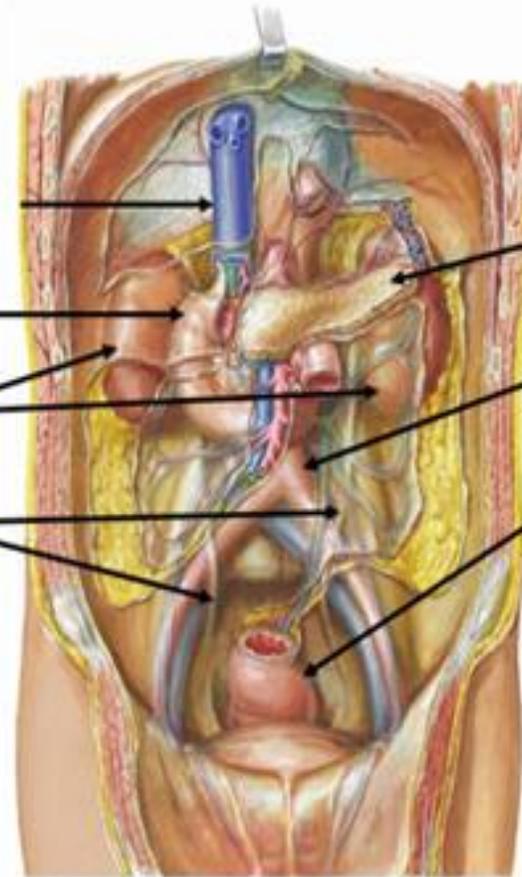
Kidneys

Ureters

Pancreas

Aorta

Sigmoid Colon

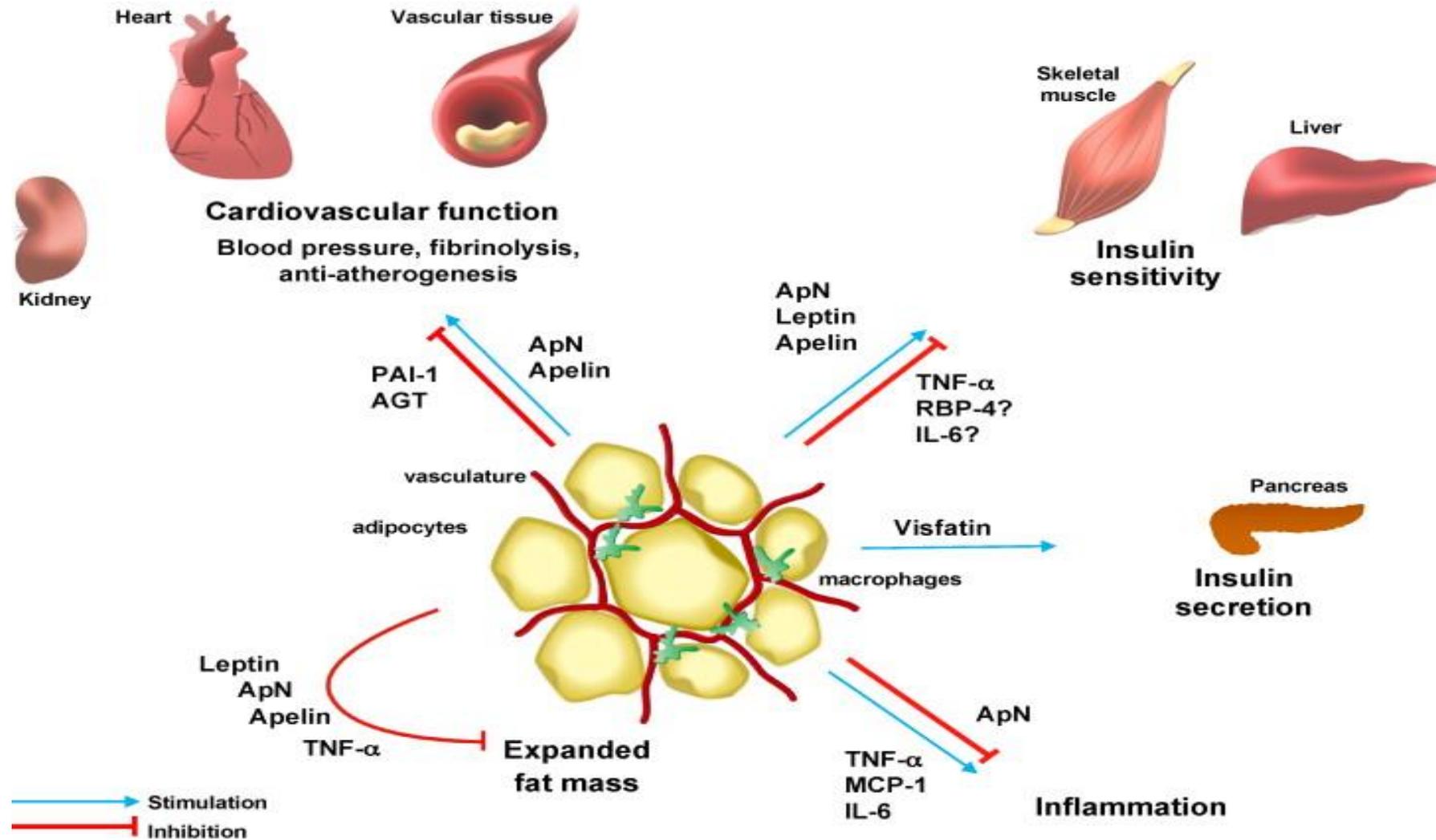


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Inflammation: "itis"

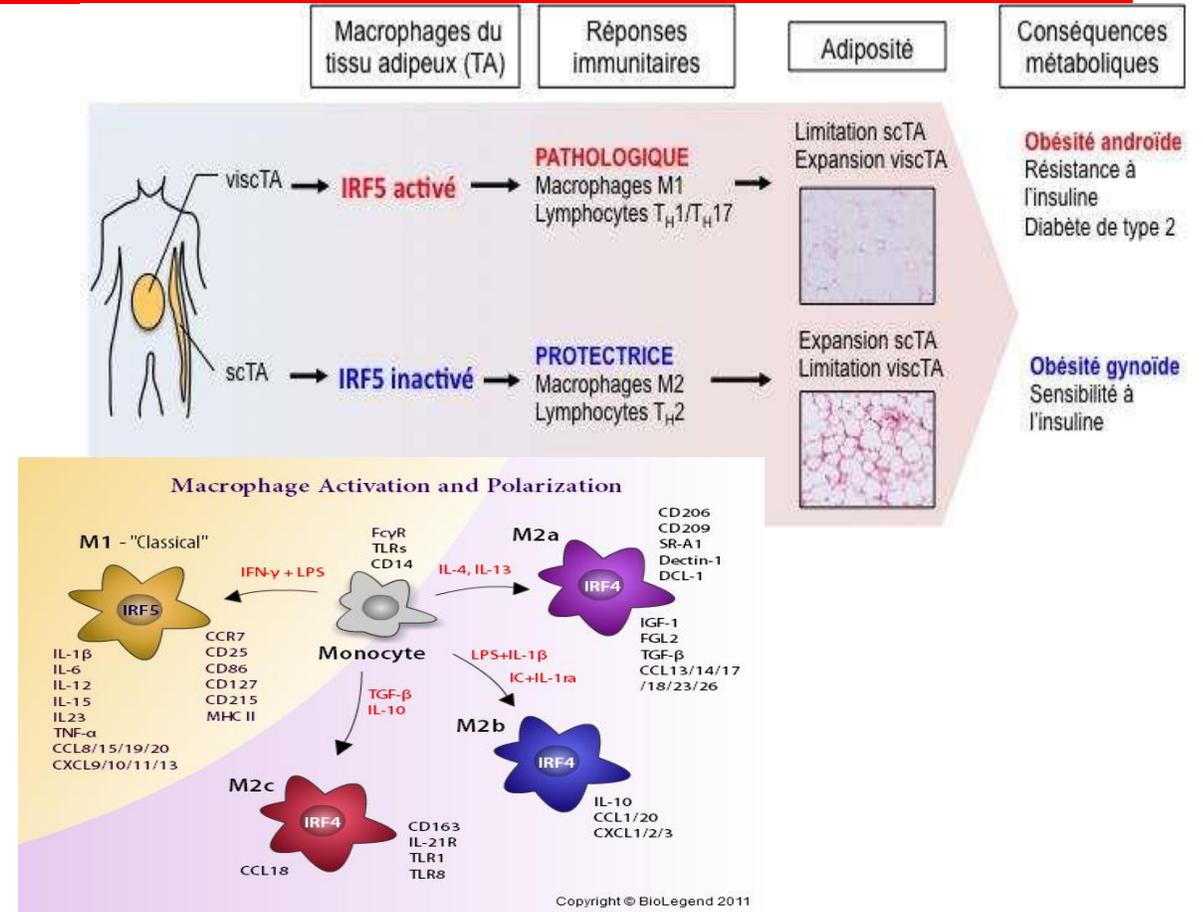


Accumulation of visceral adipose tissue correlates with elevated inflammation and increased risk of metabolic diseases

IRF5-VAT-Metabolic Dysfunction

(Dalmas '14; '15)

- Excessive weight gain → abnormal VAT distribution → pro-inflammatory mediators → activates metabolic complications
- Subcutaneous adipose tissue is protective reduces metabolic complications
- Mice deficient in IRF5 did develop obesity, but without metabolic complications
- Transcription Factor (IRF5): Interferon Regulatory Factor 5 orchestrates macrophage activation (Dalmas '14)

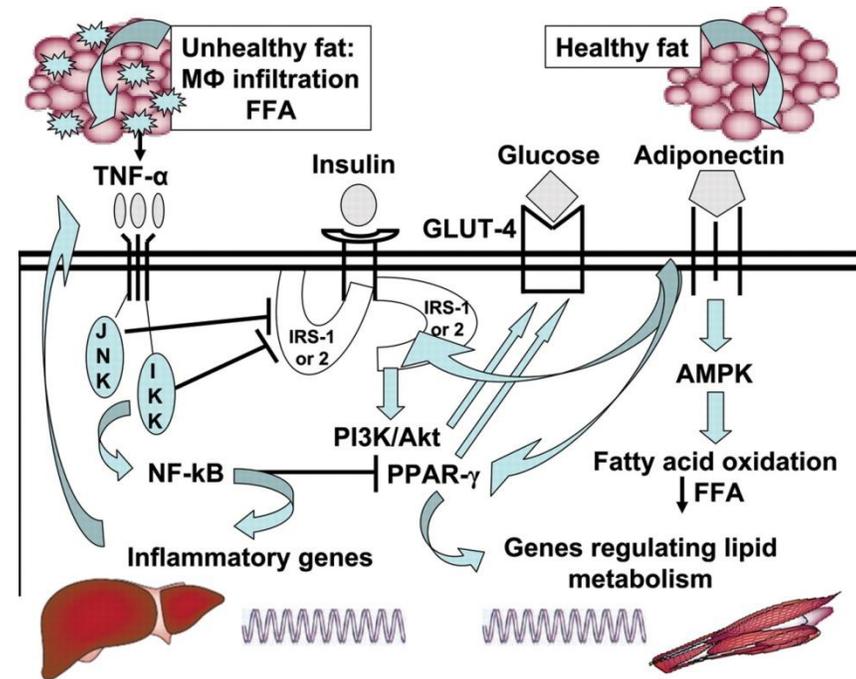


Healthy & Unhealthy Fat

(Andreotti '09)

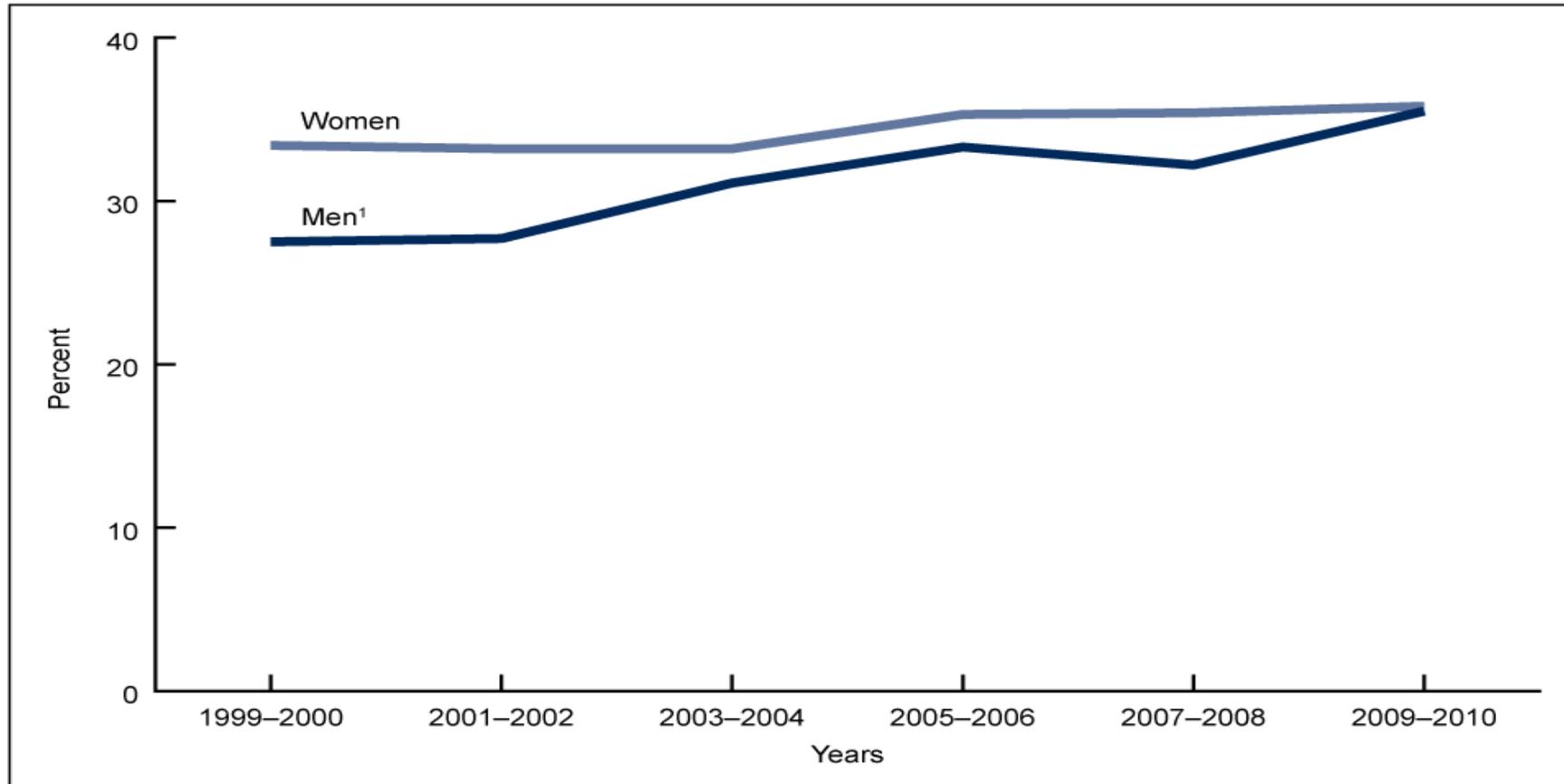
- **Unhealthy fat: Blocks insulin receptor transduction through**
 - Producing fatty acids and macrophage TNF- α , and
 - Activating inflammatory genes through inhibitor κ B kinase (IKK) and nuclear factor- κ B (NF- κ B)
- **Healthy fat releases:**
 - Adiponectin that suppresses TNF- α
 - Activates insulin receptor signaling
 - Stimulates glucose uptake
 - Promotes fatty acid oxidation through AMP-activated protein kinase (AMPK)

- **White fat produces cytokines that**
 - Affect metabolism
 - Raise plasma insulin, glucose, and triglycerides
 - Reduce cholesterol



Obesity has leveled off since 1999 – 2012 (CDC, NHANES)

Figure 4. Trends in the prevalence of obesity among adults aged 20 and over, by sex: United States, 1999–2010



¹Significant increasing linear trend 1999–2000 to 2009–2010 ($p < 0.0001$).

NOTE: Estimates were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20–39, 40–59, and 60 and over.

SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

During the same period waistlines continue to increase

STRESS

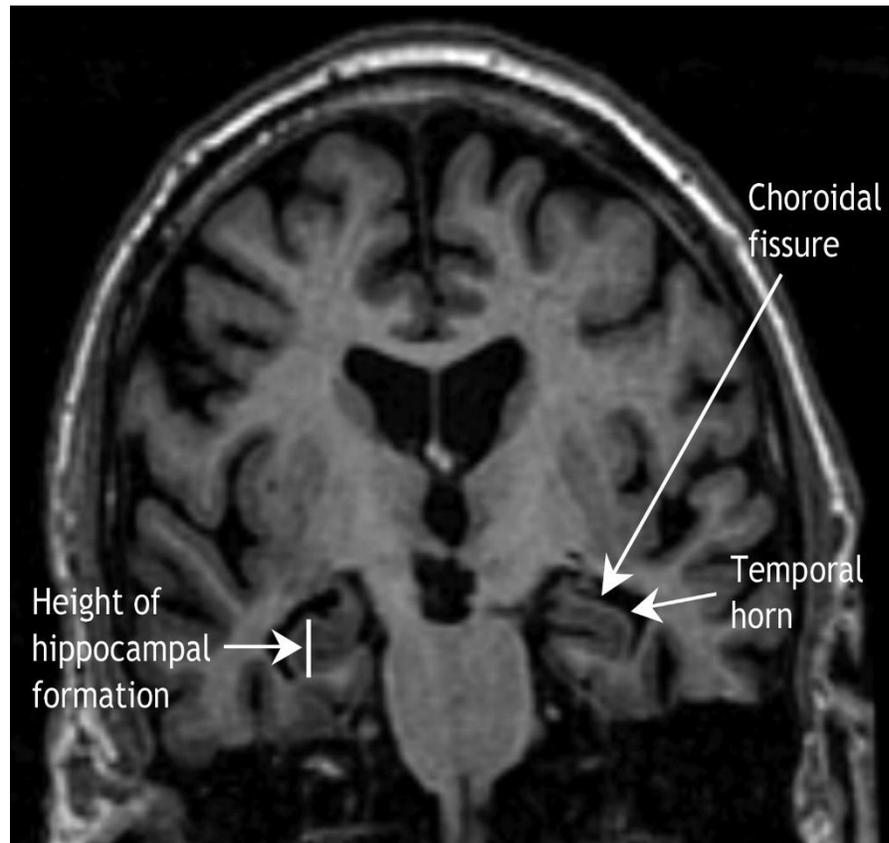
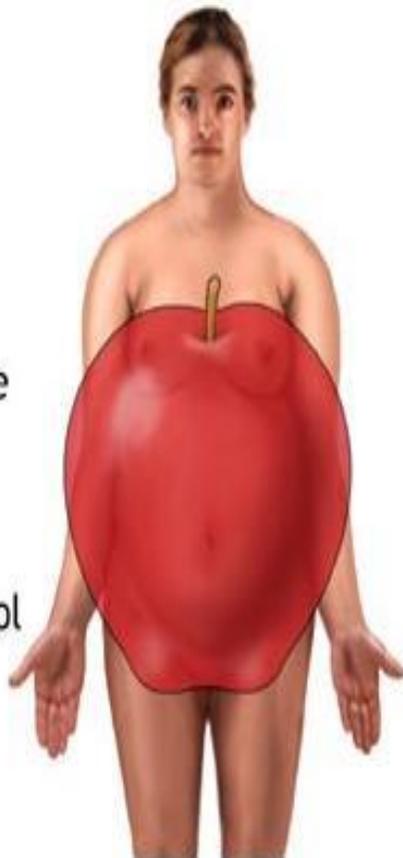
(Ford '14)	1999	2012	Δ	Abdominal Obesity Defined	2012 Prevalence
Male	38.9"	39.7"	0.8"	40.2"	43.5%
Female	36.3"	38.8"	1.5"	34.6"	57.4%

Public Enemy #1

Cortisol

Metabolic syndrome
(Syndrome X)

- Central obesity
- High blood pressure
- High triglycerides
- Low HDL-cholesterol
- Insulin resistance

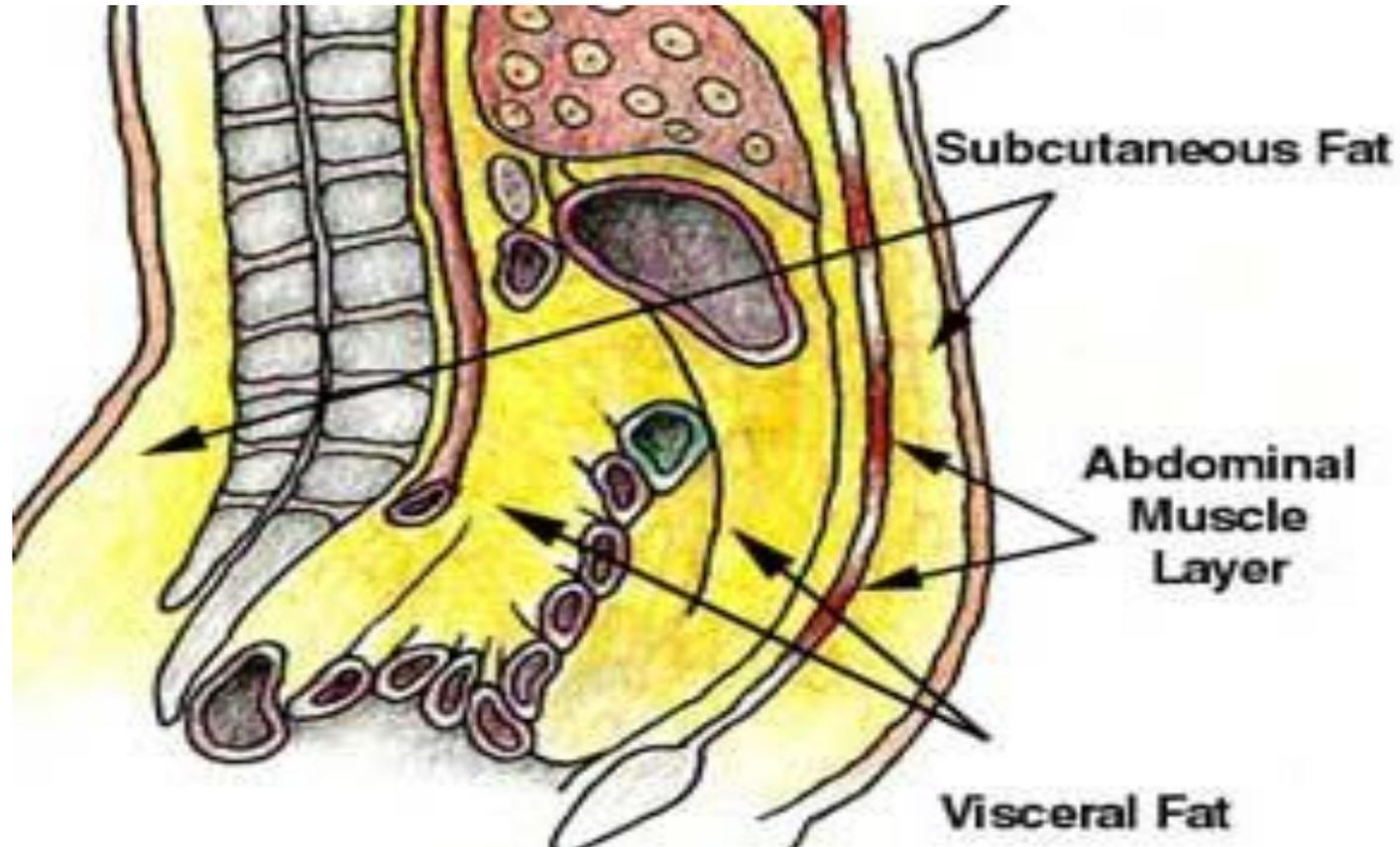


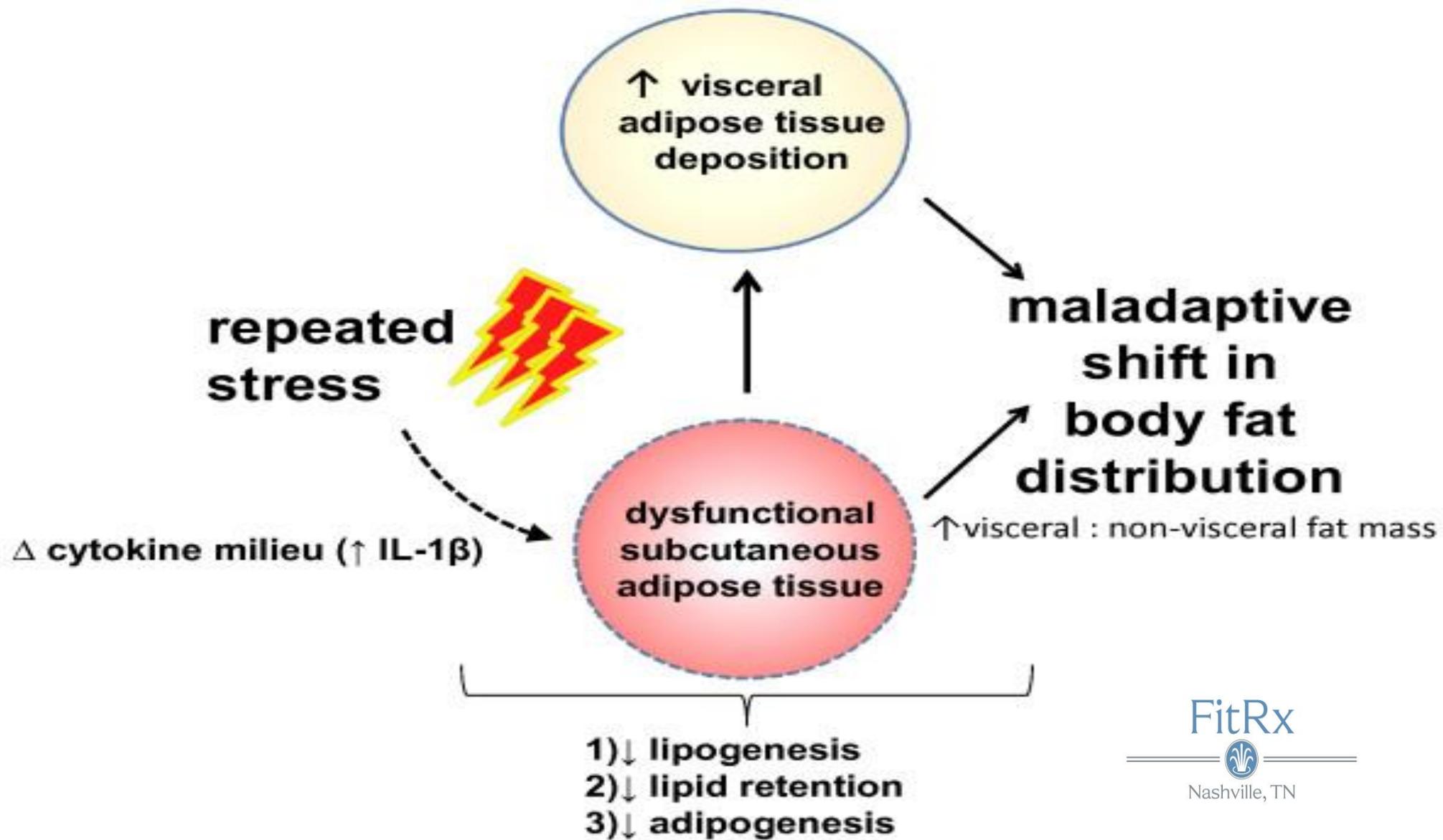
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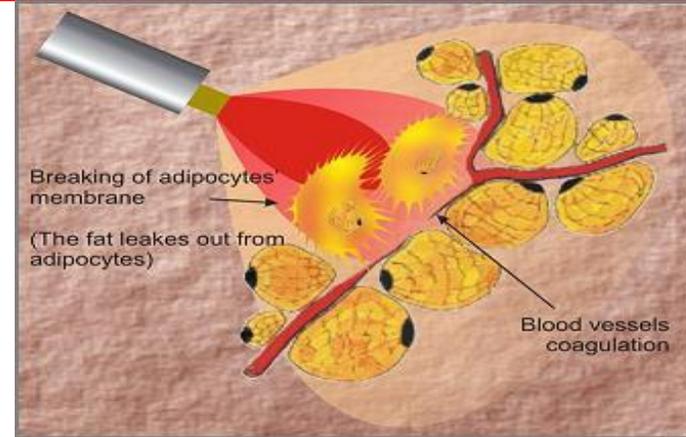
Stress → Amygdala → Cortisol → Belly Fat





Lipectomy & Liposuction

- **Rats:** Remove Subcutaneous fat → ↑ belly fat



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RECEPTORS FOUND ON ADIPOCYTE

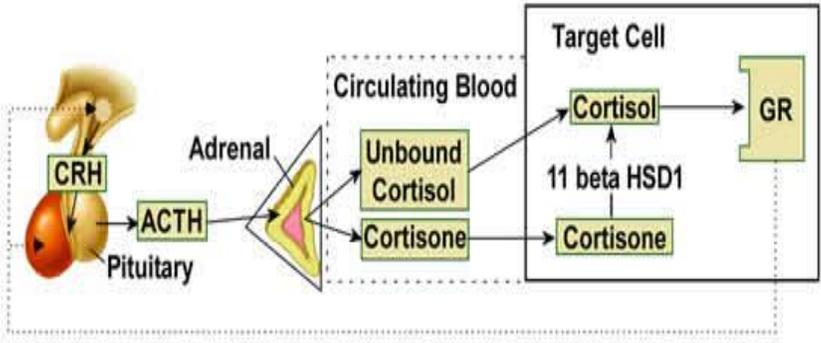
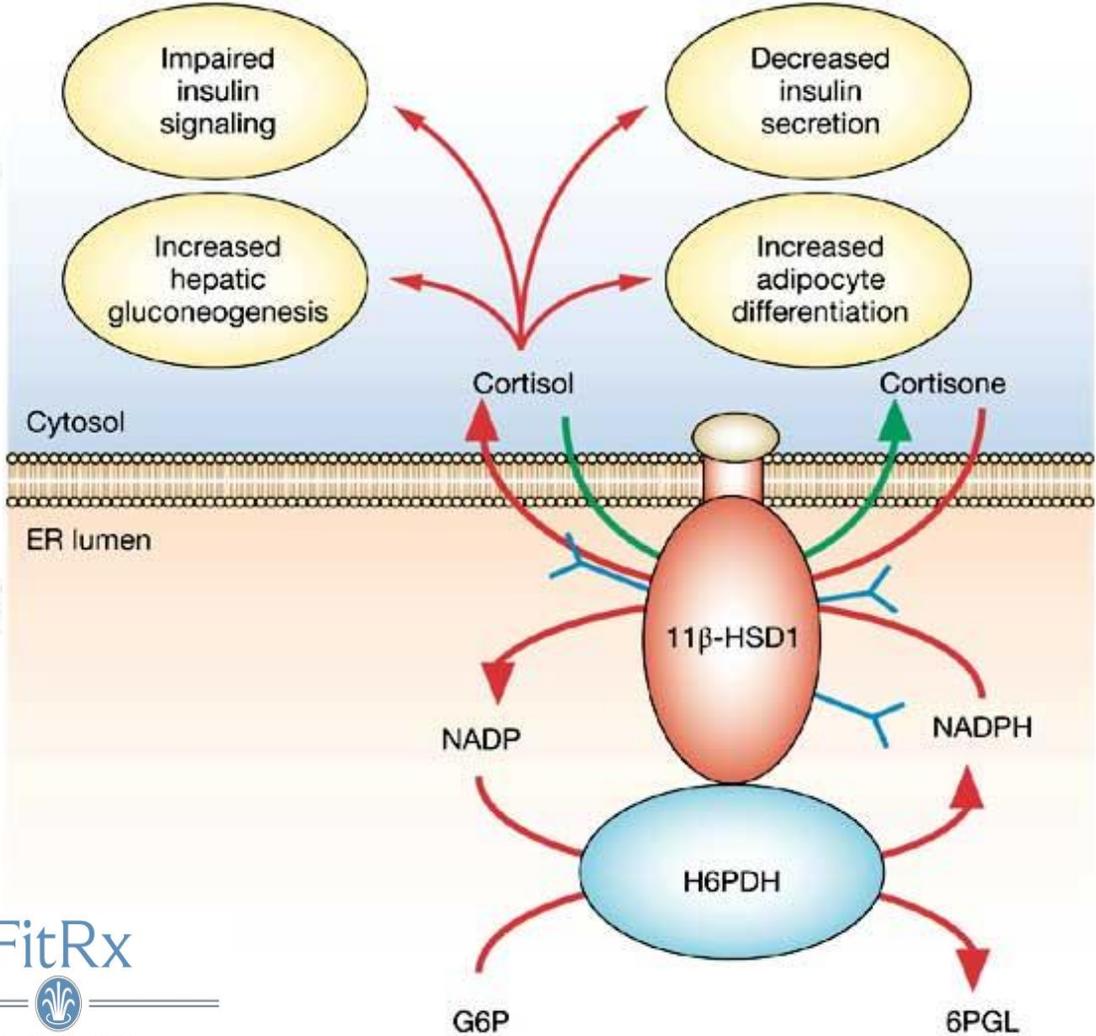


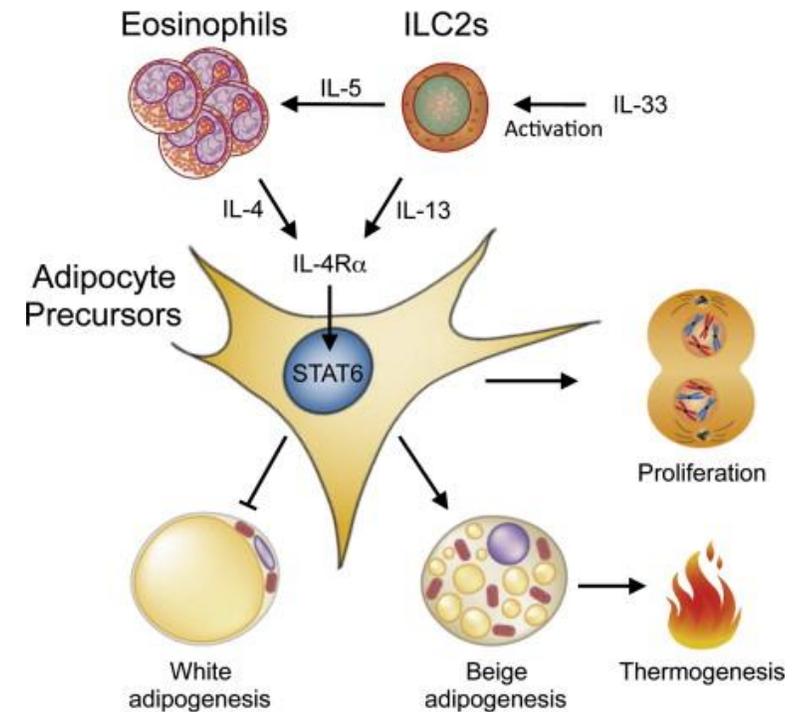
Figure 3



Belly Fat: White (storage) or Beige (heat)

(Brestoff '15)

- Stress (inflammation; infection; injury) = malnutrition inevitable
 - Hypermetabolism
- IL-33 → ICL2s → preadipocyte → beige adipose → burn calories
- Obese:
 - ↓ ICL2s = ↑ white adipose = ↑ belly fat
 - Lower metabolism



Heavier Children > scalp cortisol levels

(van den Akker '13)



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Family Stress Increases Cortisol & Risk of Obesity

(Hernandez '15; Gunderson '08; Lohman '09; Garasky '09; '12)

- **Repeated chronic stress:**
 - **Financial problems**
 - Instability > high income! (Ryan '13)
 - **Family stress (e.g. divorce 89% > VAT)** (Biehl '15)
 - **Lack of cognitive stimulation and emotional support** (Garasky '09; '12)
 - **Food insecurity (size?)**(Gunderson '08)
- Increase cortisol
- **Overconsumption of Highly Palatable Foods**



**Children of Authoritarian
Parenting more likely to be
obese**
(Barnette '14)

- **Demanding parents:**
 - Rigid about rules, demanding,
 - Stingy with affection, not emotionally responsive,
 - Inflexible limits
- **Balanced parenting:**
 - Set healthy boundaries
 - Affectionate
 - Discuss behavior, allowed to participate in decisions



VAT results from chronic psychosocial stress & arousal of the HPA axis: Identical Twins

(Marniemi '02)

- Accumulation **VAT** rather than obesity
 - Genetic factors were identical
- More psychological stress
- Poor quality sleep
- Drank 2.5 x more alcohol



Unborn Children of Mothers who experienced significant stress are more likely to Grow up Obese

(Hohwu '14)

- e.g. Death of a close relative
- Even if stress occurred months before pregnancy
- Cortisol programs fetus to develop more fat cells and fat storage early in life
 - Leads to the development of obesity
- Also, more susceptible to chronic diseases



Children of very obese mothers going into pregnancy are at increased risk of emotional and behavioral problems

(Jo, T et al Pediatrics, May 1, 2015)

- BMI > 35; Going into pregnancy
- ADHD and developmental delays at age 6
 - Higher risk; but 93% unaffected
 - 20% more emotional symptoms and conduct problems
- Ruled out confounding circumstances (smoking; genetics)
- Strong and consistent association
- Correlation is not Causation





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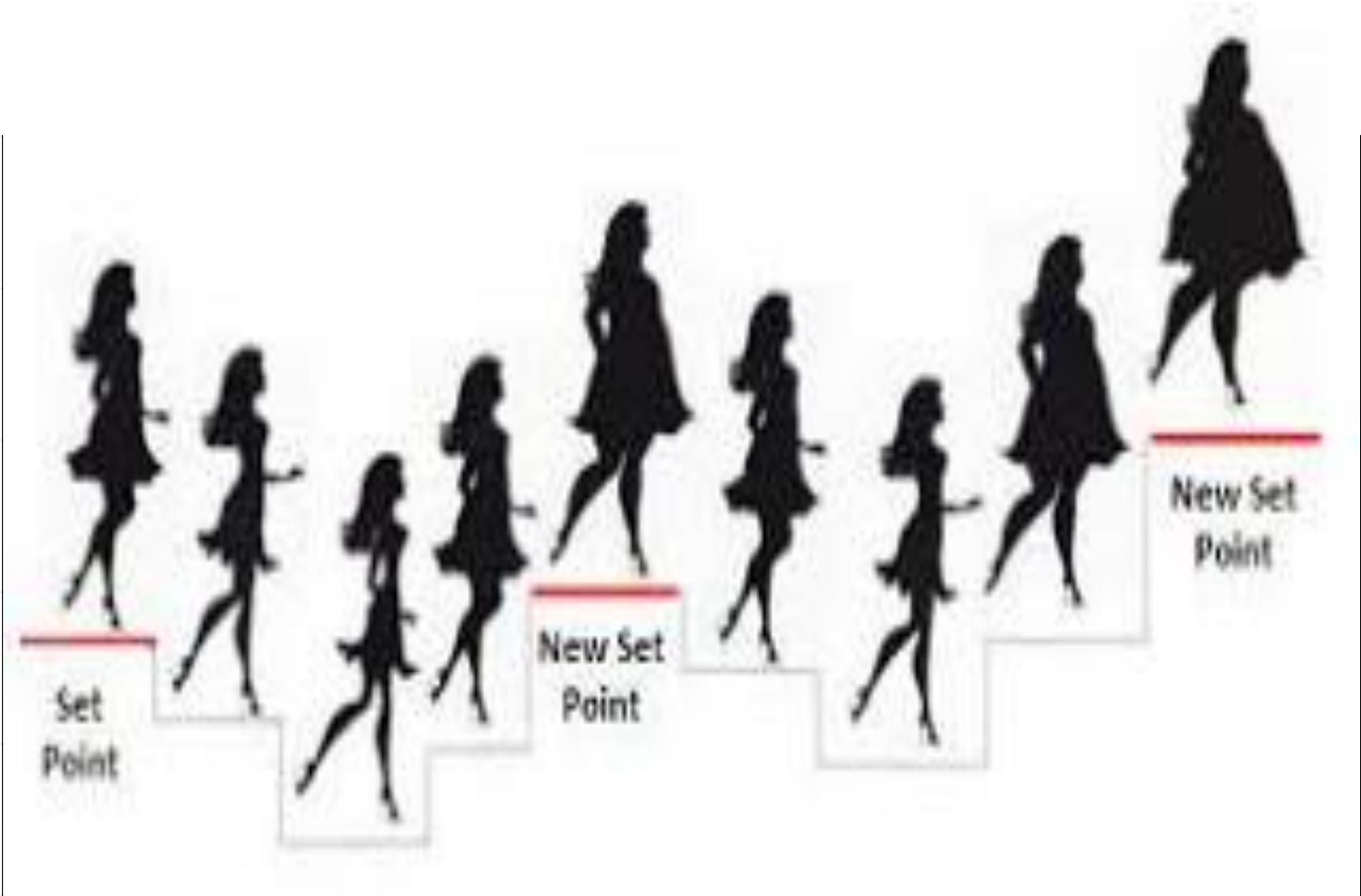
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Eat less move more may not do it

- **Is it a condition of poor choices**
 - **Cannot simply eat less and exercise more to lose weight**
- **A cascade of biological responses in their body designed to thwart weight loss and return them to their pre diet weight levels**
 - **Leptin is the driver of fullness hormones drops**
 - **Ghrelin goes up and signal a raging appetite**
- **Lose 15% of your body weight**
Leptin is going to drop by 65%
which means the body thinks its starving
- **Your metabolic rate drops 20%**
if you lose 10% of your weight
- **Have to burn 450 calories to compensate for their lower metabolism**

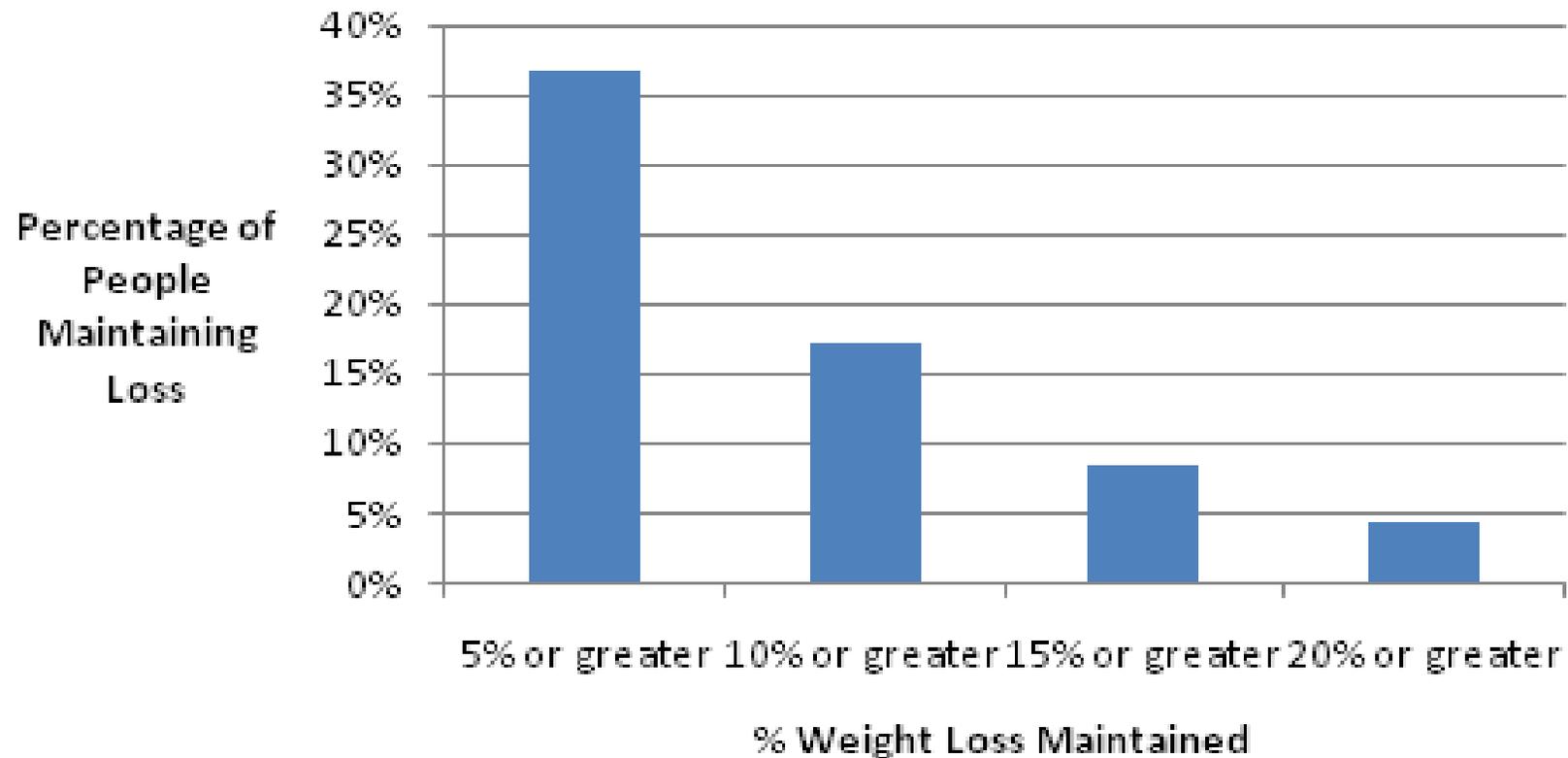


NHANES: 1999 - 2006

14,306 People

Kraschnewski JL [Int J Obes](#) (2010) 34: 1644 – 1654

Long Term Weight Loss Success



LONG TERM WEIGHT LOSS SUCCESS?

“Defined as losing at least 10% of initial body weight and maintaining the loss for at least 1 year”

Wing RR Am J Clin Nutr (2005) 82: 222S – 225S

5 Year Success Rate?



Would you buy a new car if there was a 2% to 5% chance it would not run >1-5 years?

Diet and exercise are not effective in successful treatment of obesity

(Fildes '15)

National Institute of Health Research (NIHR) tracked the weight of 278,298 patients between 2004 to 2014

- 5% [meaningful for health benefits]
 - 1 in 10 Chance
 - 78% regain in 5 years
- Best opportunity is prevention

Chances achieving normal body weight

Obese

Severely obese

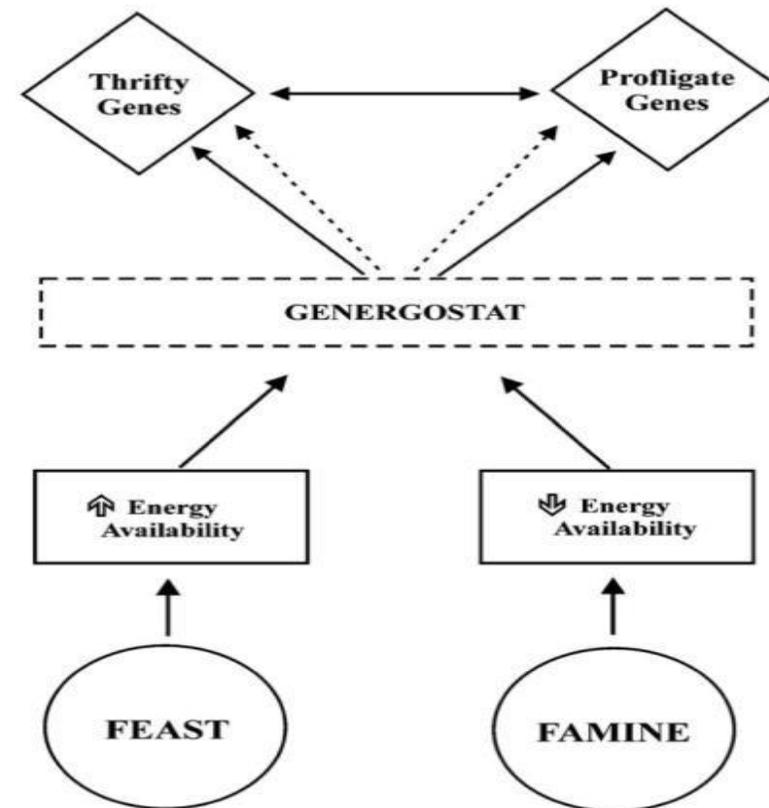
1 in 200 men	1 in 1,290 men
1 in 124 women	1 in 677 women

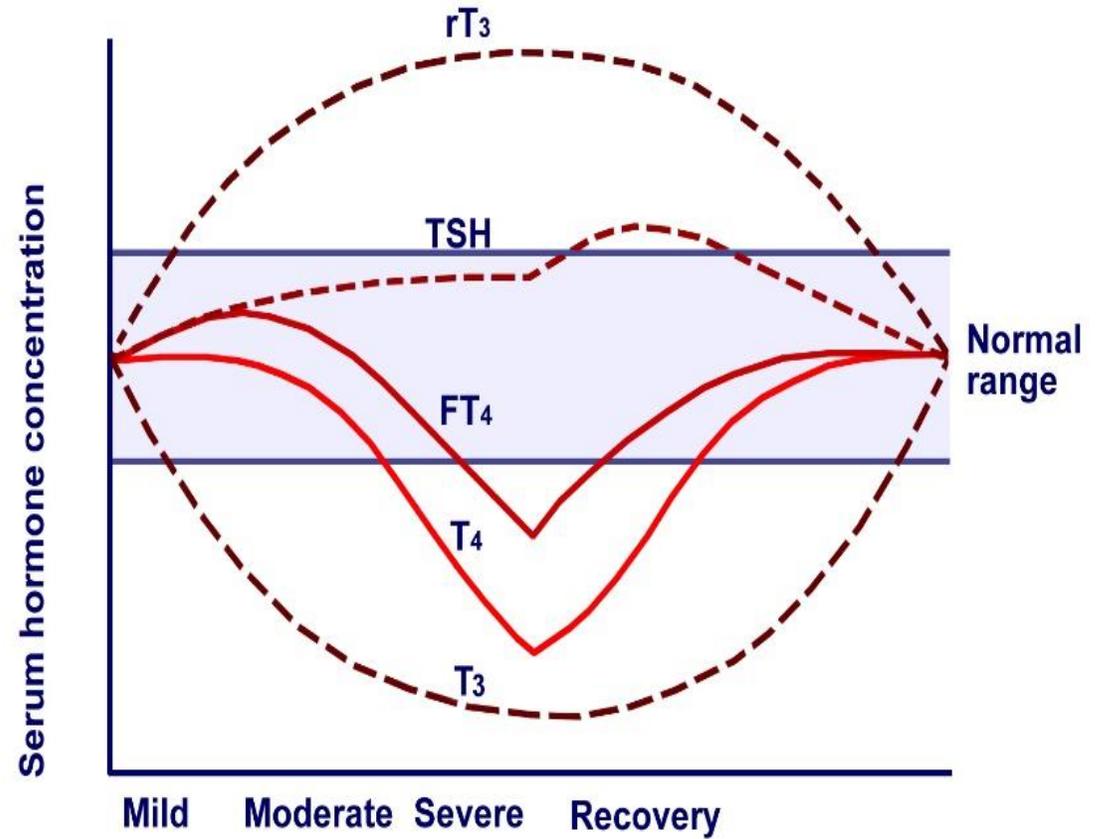
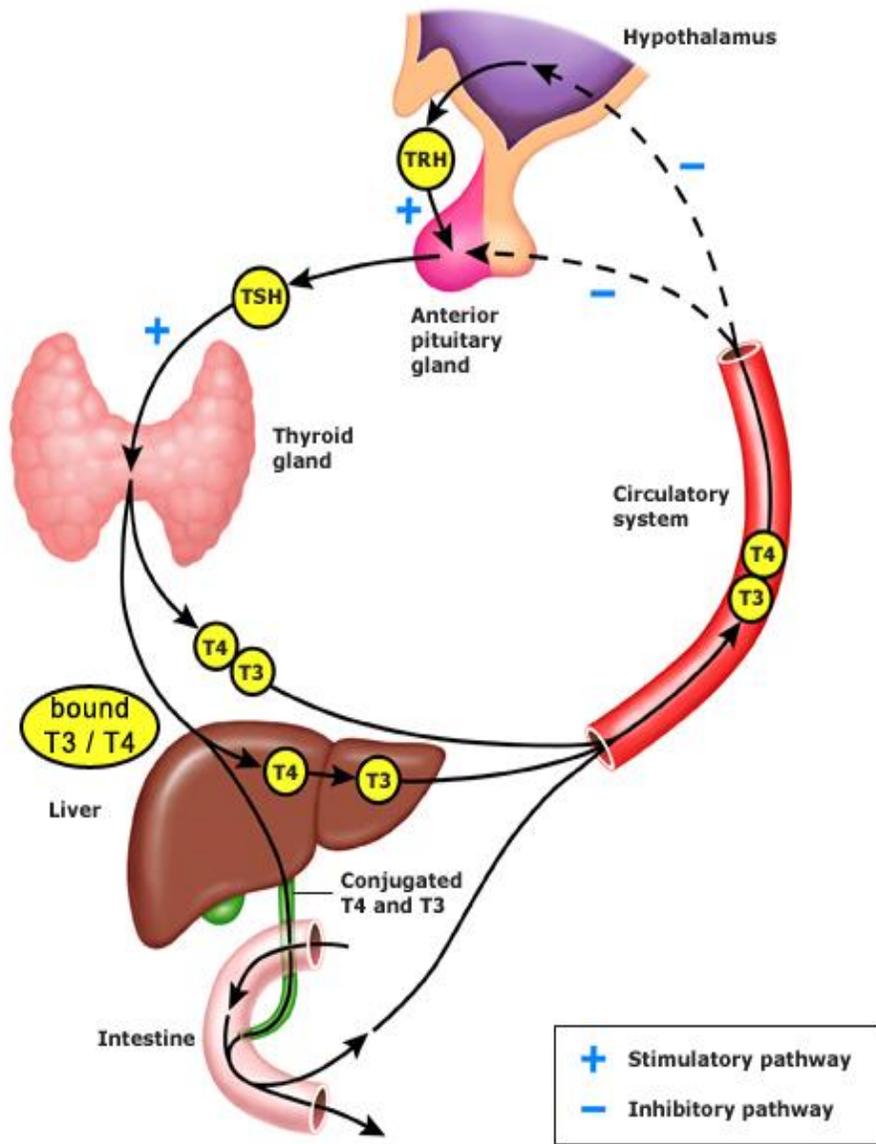


Thrifty Gene: Ensure survival in times of limited food supply

(Siervo '09)

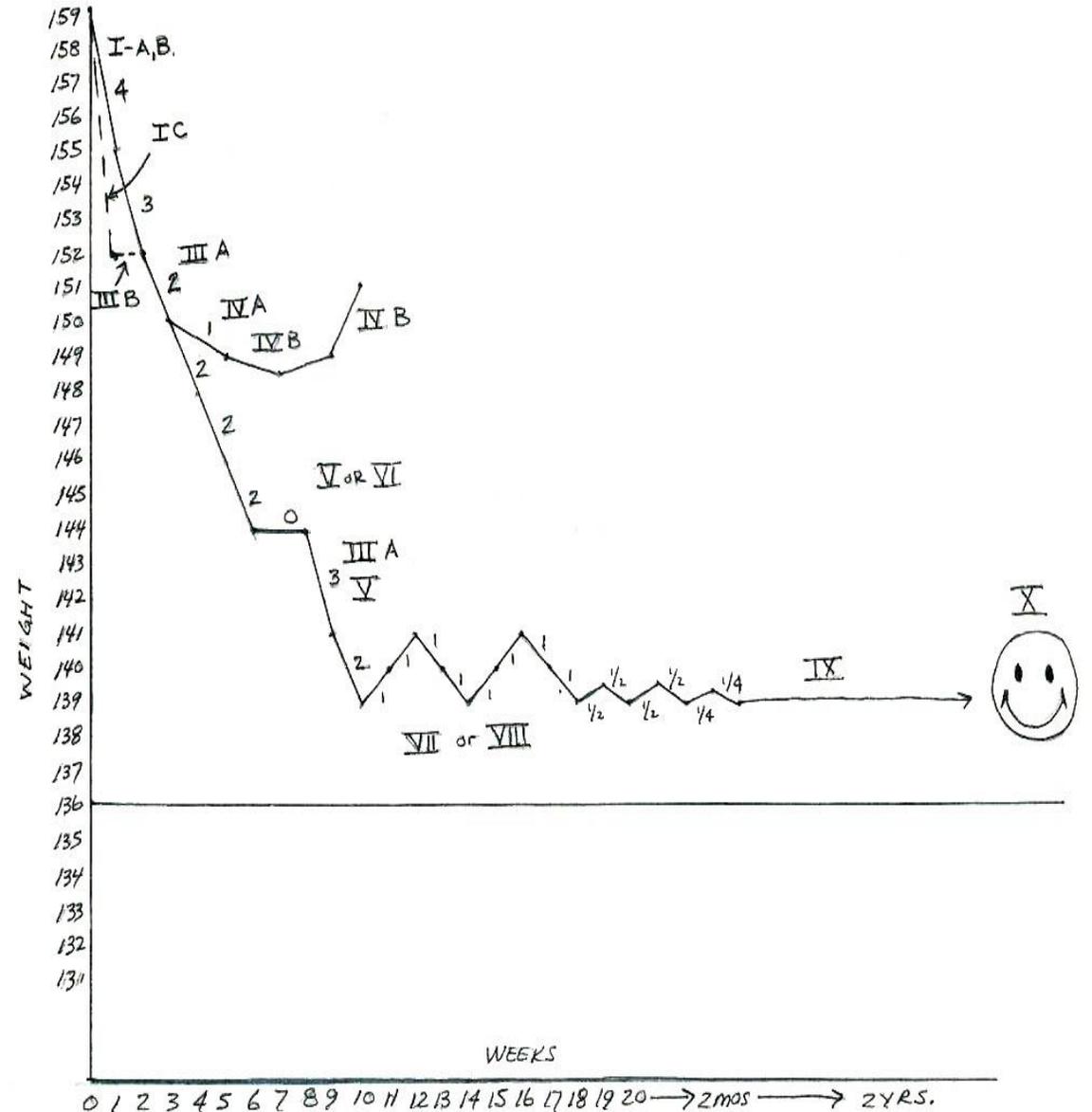
- Unlimited food
 - Not influenced by seasonality
- Sedentary
- Sleep deprived
- Psychosocial stress
- Thrifty genes are constantly activated to enhance energy storage
- Stress-induced hypercortisolemia in the setting of **unlimited food** supply promotes adiposity





Theory 1: Diet \rightarrow rT3

- **Sufficient energy: $T_4 \rightarrow T_3$**
 - Removes distal iodine
 - Fits into cell receptor
 - Increases energy expenditure
- **Energy depletion: $T_4 \rightarrow rT_3$**
 - Removes Proximal iodine
 - Does not completely fit into receptor
 - Lower metabolism
- **Cessation of weight loss**
 - Set point



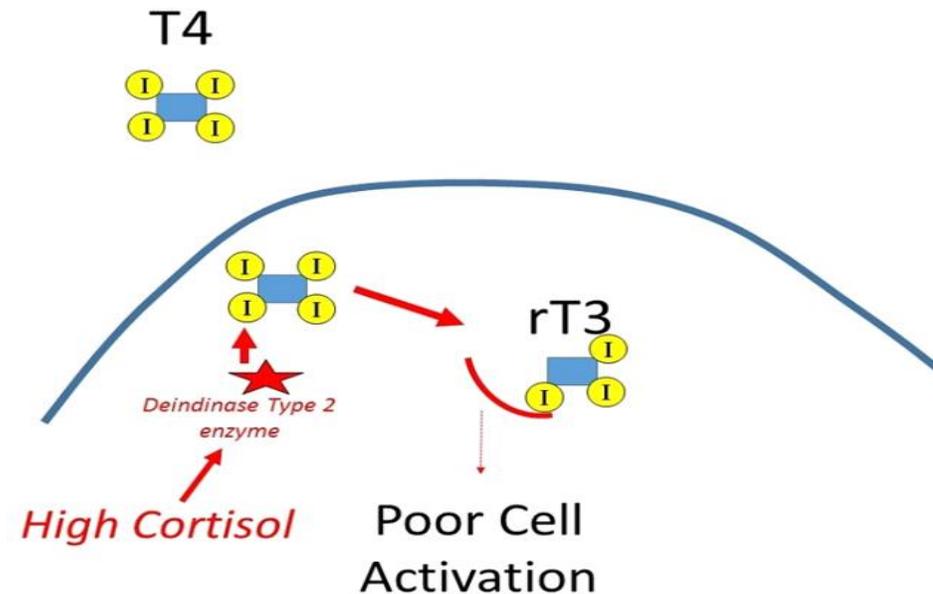
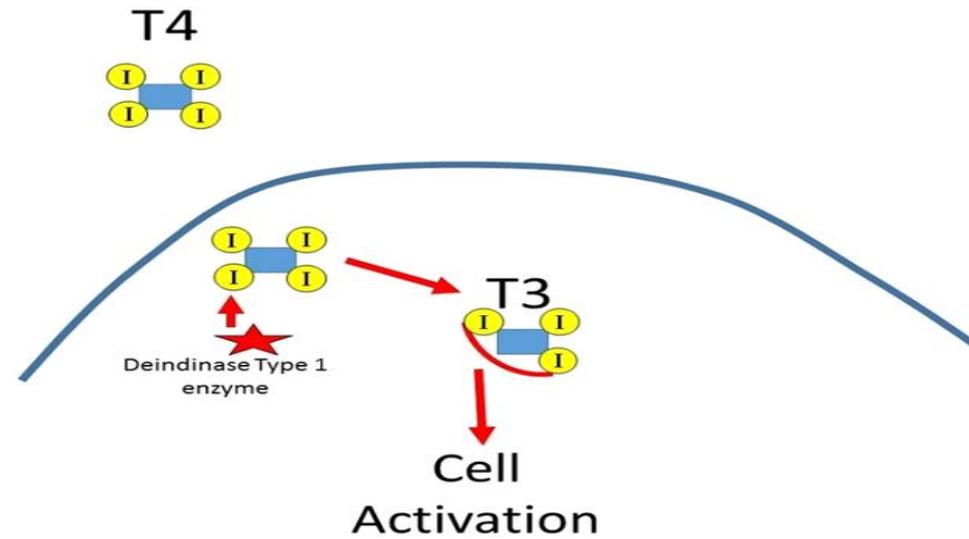
Theory 2: rT3 : Cortisol

(Walter '12; Chopra '77;

<http://www.naturalendocrinesolutions.com/articles/reverse-t3-what-you-need-to-know-about-it/>)

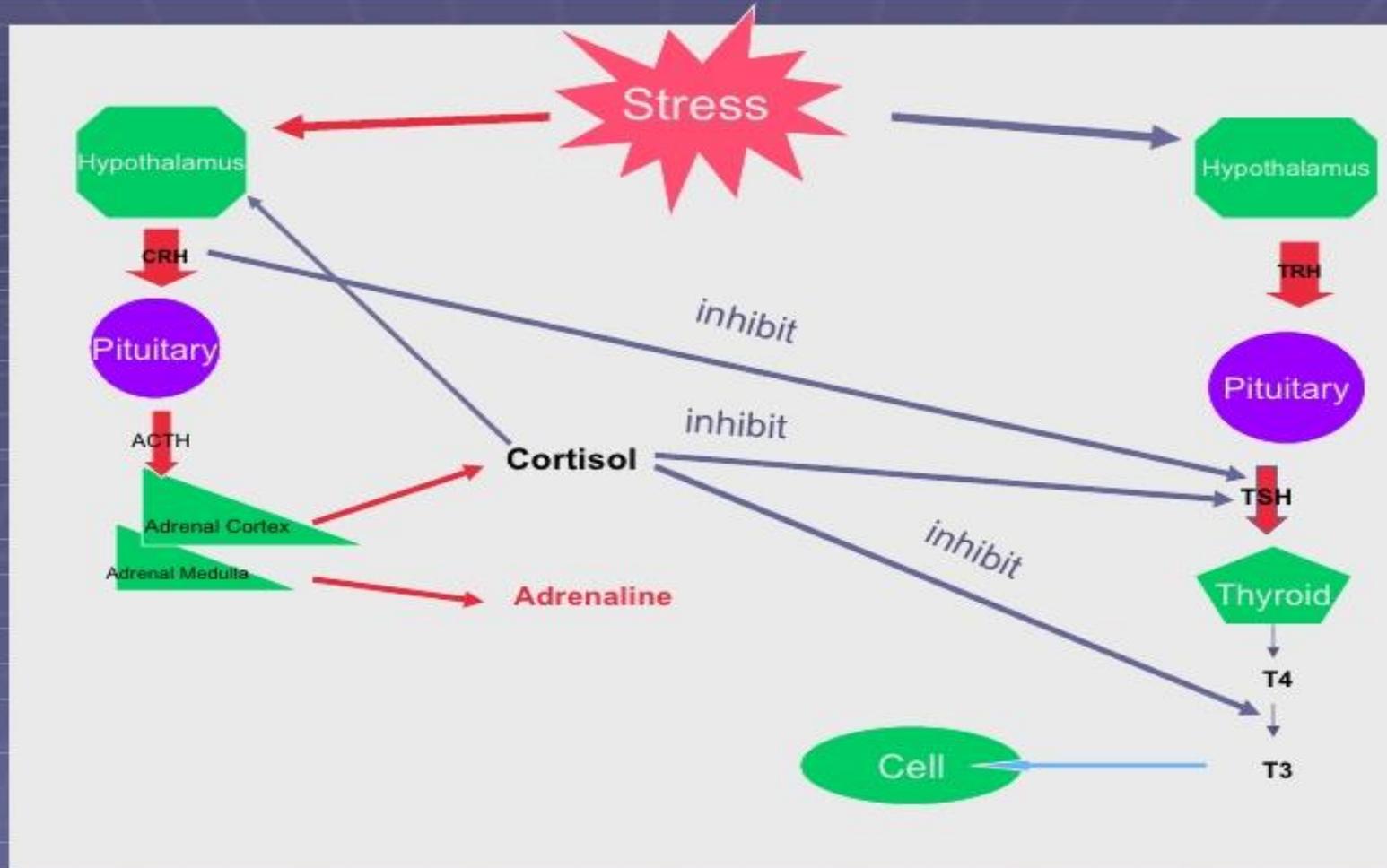
- **Peripheral vasculature**
- **T₄ → deindinase-1 → T₃**
- **Repetitive chronic stress**
 - Diet perceived as a stress
- **Produce excess cortisol**
 - → Deindinase-2
- **T₄ → deindinase-2 → rT₃**
- **Cortisol modifies the conversion of T₄ to T₃ (High rT₃)**

http://banksnutrition.com/?page_id=72



Theory 3: Stress-induced Thyroid Dysfunction

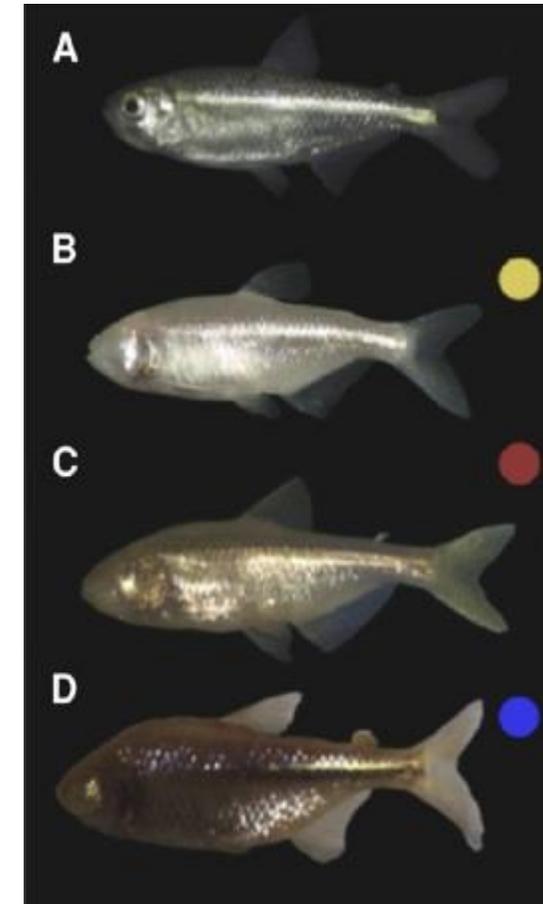
Stress-induced Thyroid Dysfunction



- Inhabit dark, isolated caves in NE Mexico
- Adapted to harsh environment
- Compared to surface dwelling cousins
 - Store massive amounts of fat (obese)
 - Burn fat more slowly to preserve fat reserves (lose weight $\frac{1}{2}$ as fast)
 - With little food became resistant to starvation
 - Live for months without food (surface fish did not)
 - When food becomes available (swept by rare floods), cavefish eat without limit and store energy until the next feast
 - Live long healthy lives despite being so overweight and fatty livers

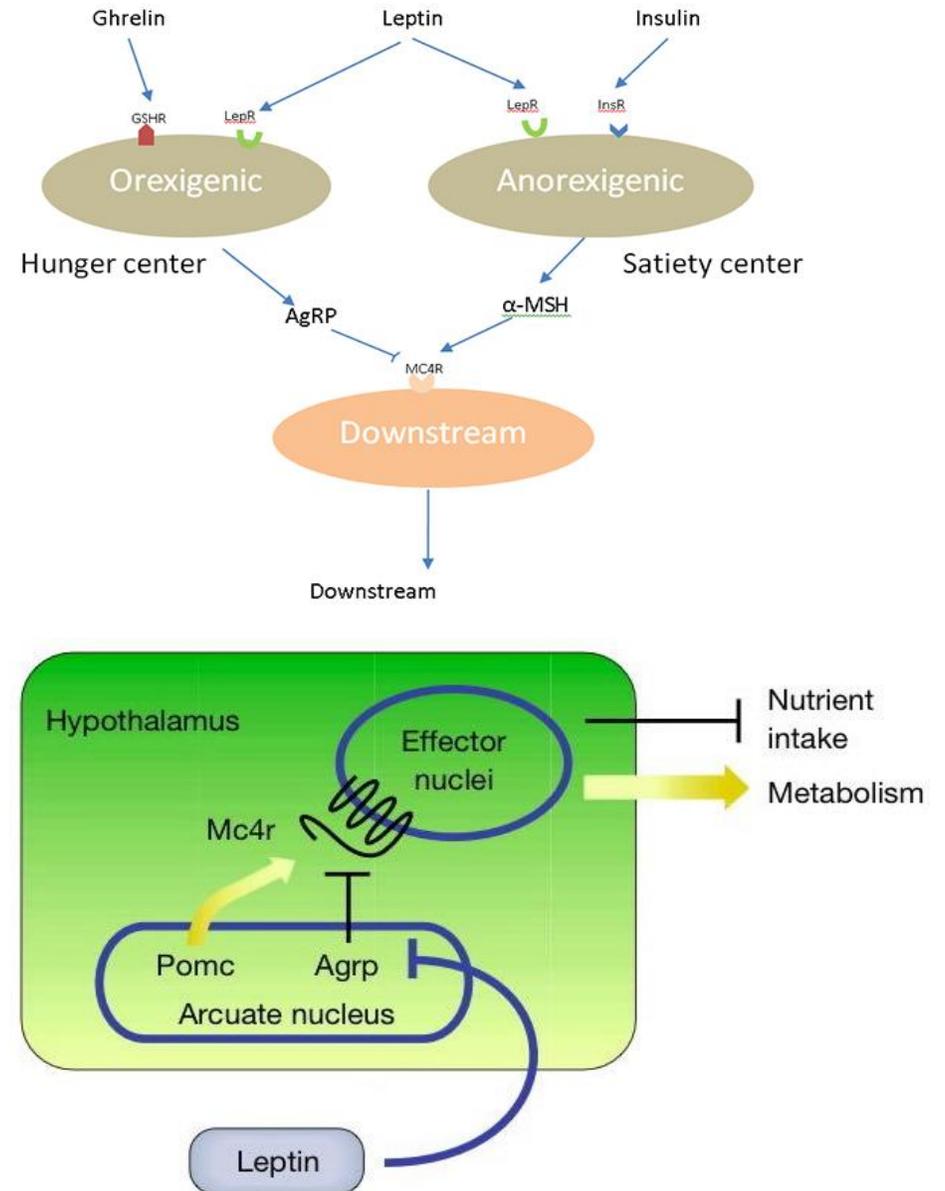
Mexican Blind Cavefish: Starvation and Binge Eating

(Ariel '15)



MC4F: Starvation and Binge Eating (Ariel '15)

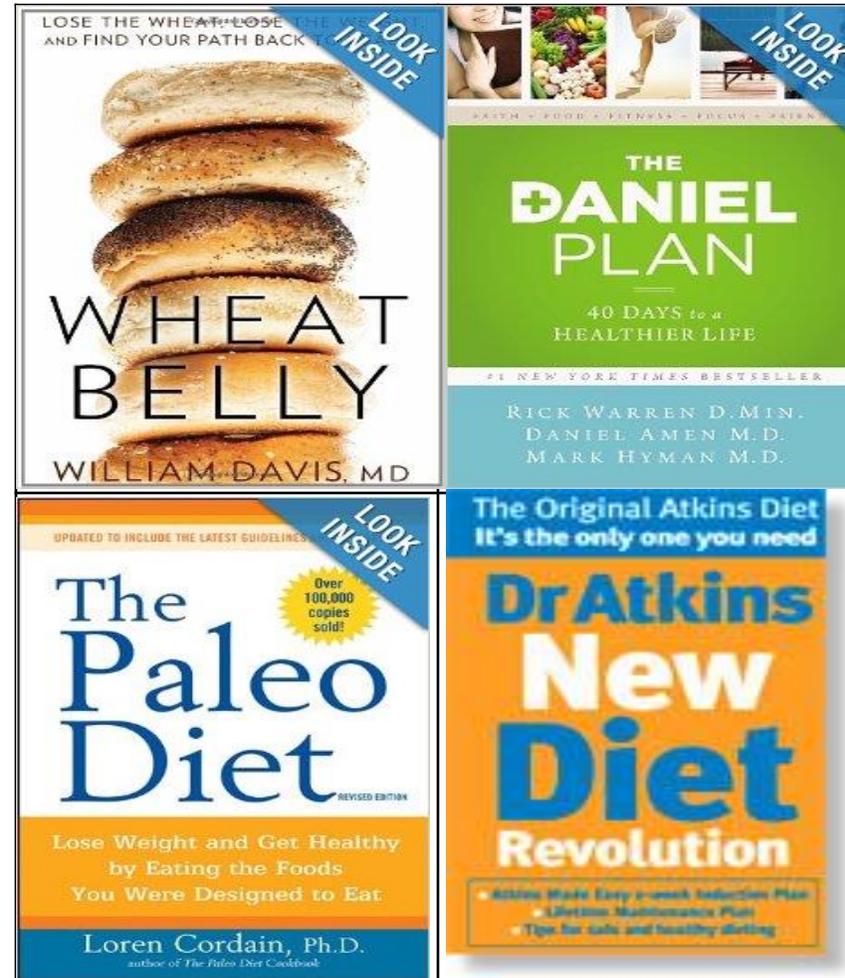
- **MC4R: regulates leptin and insulin in the brain (hunger and weight)**
 - Attempt to maintain current body weight
- **Mutation in the MC4R gene**
 - Explains insatiable appetite in humans
 - Most common single gene cause of inheritance of obesity
 - Adapt to starvation-binge cycle
 - Turns off appetite suppression
 - Burns 30% less energy to survive
 - Eliminate circadian rhythm metabolism
 - Gene selected to have evolutionary advantage



Dieting is ineffective because \uparrow stress \rightarrow \uparrow cortisol

(Toniyaama '10)

- Starvation
- Deprivation
- Monitoring
- Frustration



First 2 months predict long term (8year) success

(Unick '15)

- **Look AHEAD Study**
 - 2,290: Largest US study using diet and exercise alone
- **First two months**
 - Reduced adherence
 - Low initial weight loss
- **Continued treatment leads to**
 - Frustration & decreased interest



Ghrelin

(Jerlhag '04' '07; Lutter '08)

- Ghrelin defends against **chronic stress** (Lutter '08)
 - Rats: Elevated plus maze or forced swim test
- Ghrelin defends against depressive-like symptoms of chronic stress
 - Humans: Caloric restriction
- Ghrelin activates dopaminergic **circuit** (Jerlhag '04; '07)



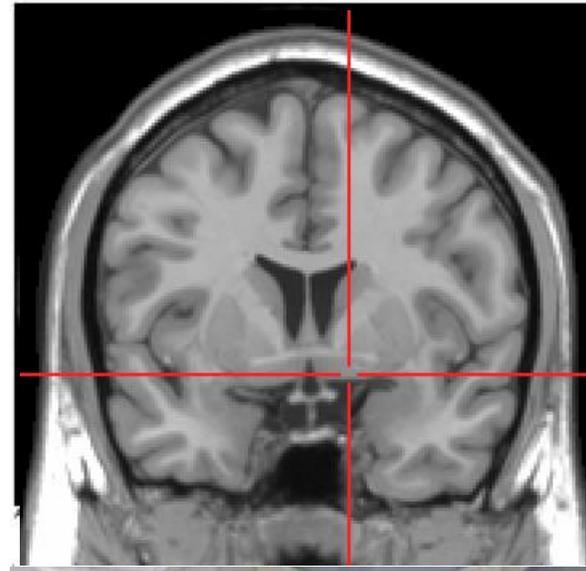
Cortisol's Effect on Snacking

(Brownell K Society for Behavioral Medicine; New Orleans 2000)



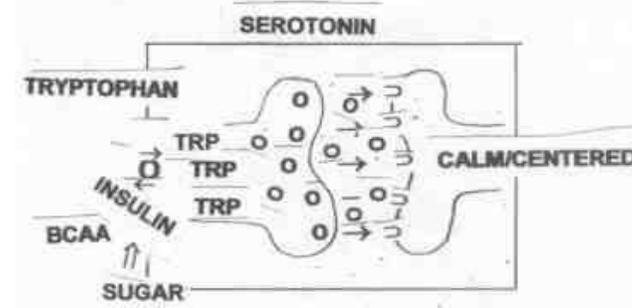
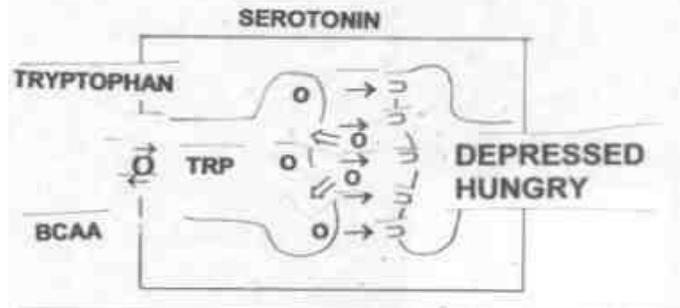
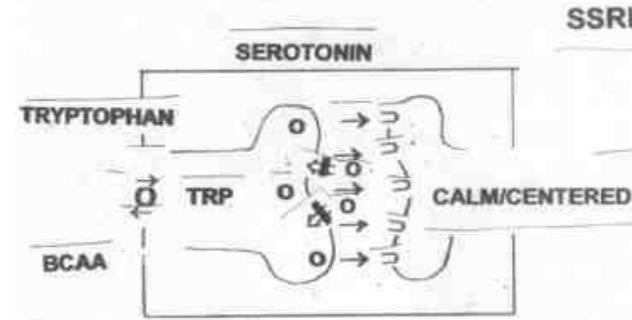
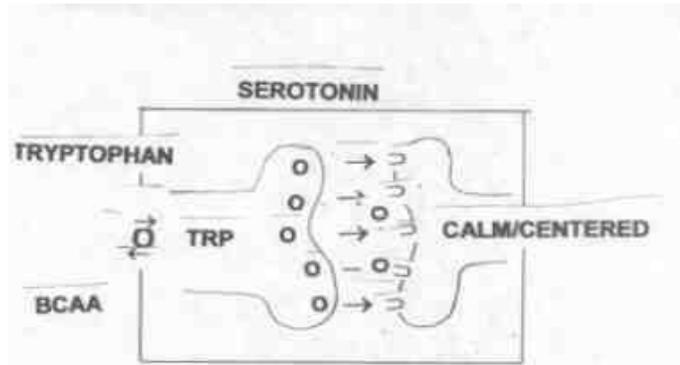
High Fat Food is Self-Soothing

(van Oudenhove '11)



Glycemic Index (Sugar) → ↑ Serotonin → Calming

(Wurtman '03)



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- Chronically Stressed
- Calorie dense food
- ↑ Mesenteric fat
- ↓ Cortisol response



- Chronically stressed
- Comfort foods
- ↑ VAT
- ↓ Cortisol response

Abdominal Fat is Self-Soothing

(Tomiyama '11)

The Belly Project:
Real Photos,
Real Women



DIET

- Stress ↑ reinforcing value of palatable food (Goldfield '07)
- Dietary fat & sugar ↓ Stress

STRESS REDUCTION

- Stress predates BED (Cash '04; Godart '06; Hinrichsen '07)
- Dieting ↑ Stress
- Stress → ↑ Belly Fat

ATTUNED EATING

TECHNIQUE	HUNGER
GENTLE EATING	SATIATION
MINDFUL EATING	SATIETY
"SAVORING" PRINCIPLES	APPETITIVE
CONSCIOUS EATING	SATISFACTION
INTUITIVE EATING	EMOTIONAL

Draconian Exercise = ↑ Cortisol

(Hill '08; Mastorakos '05; Skolud '12; Shakeri '12; Lovallo '06)





Physical Wellness; Joyful Movement; Active Lifestyle

- **Reduces Cortisol** (Creswell '13; Oswald '05; Ahmadzadeh '06; Mastorakos '05)
- **Socialization** (Maestriperi '10; Brown '09)
- **Laughter** (Berk '89)
- **Music you enjoy** (Thoma '13)
- **Pets** (Beetz '12)
- **Massage** (Field '05)
- **Loving kindness mediation [yoga]** (Amen '98)



Does “Exercise” Help You to Lose Weight?

- Walk a mile = 100 calories
- One lb. body fat = 3500 calories
- = 35 miles to lose ‘one lousy pound of fat’
- = 55 miles if not in a coma prior to walking
- = 70 miles when you consider you are burning protein also

Fiber

Food sources of fiber include whole wheat, bran, fresh or dried fruits, and vegetables



ADAM.



Track my **Food** Activities Weight

Today Mar 19 Select

What did you eat? How much?

When? Morning Log Food

Daily Totals

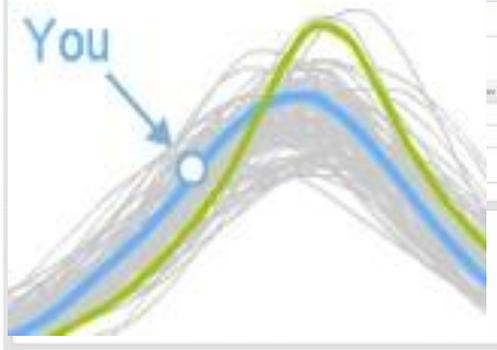
Calories **963** Fat **50 g** Fiber **27 g** Carbs **46 g** Sodium **317 mg** Water **52 fl oz**

Logged Food: **Morning**

Food	Amount	Cal	Fat	Fiber	Carbs	Sodium	Fat
Coffee	12 fl oz	3	0	0	1	0	★
Cereal (Raisin Bran, Generic)	4 cups	189	6	5	27	583	★
Soy Milk, Vanilla (soymilk) (Sun Soy)	2 cups	42	14	0	30	105	★

Logged Food: **Afternoon**

Food	Amount	Cal	Fat	Fiber	Carbs	Sodium	Fat
Fresca (Generic)	12 fl oz	3	0	0	1	0	



Top Foods Most Eaten Recent

Click on a food to log it.

- 16 Fresca (Generic)
- 188 Burrito, Bean & Cheese (Generic Restaurant)
- 40 Cereal (Denny's)
- 404 McChicken Sandwich (McDonald's)
- 140 Cereal Bar, Mixed Berry (Nutri-Grain)
- 400 Soy Milk, Vanilla (soymilk) (Sun Soy)
- 408 Chocolate Candy, M&M's Plain (M&M Mars)

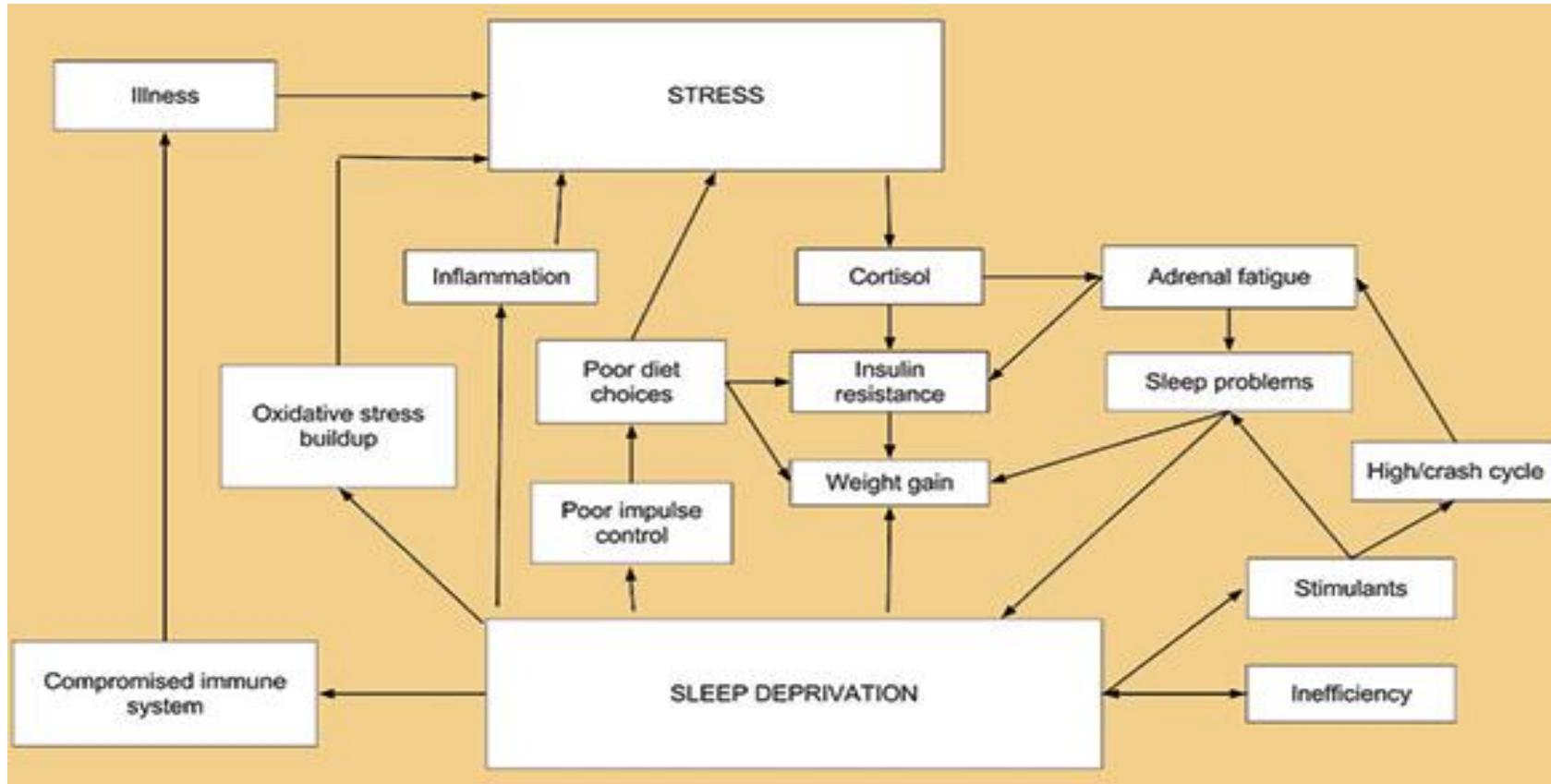
Favorites Food Meals

Click on a food to log it.

- 16 Fresca (Generic)
- 188 Burrito, Bean & Cheese (Generic Restaurant)
- 40 Cereal (Denny's)
- 404 McChicken Sandwich (McDonald's)
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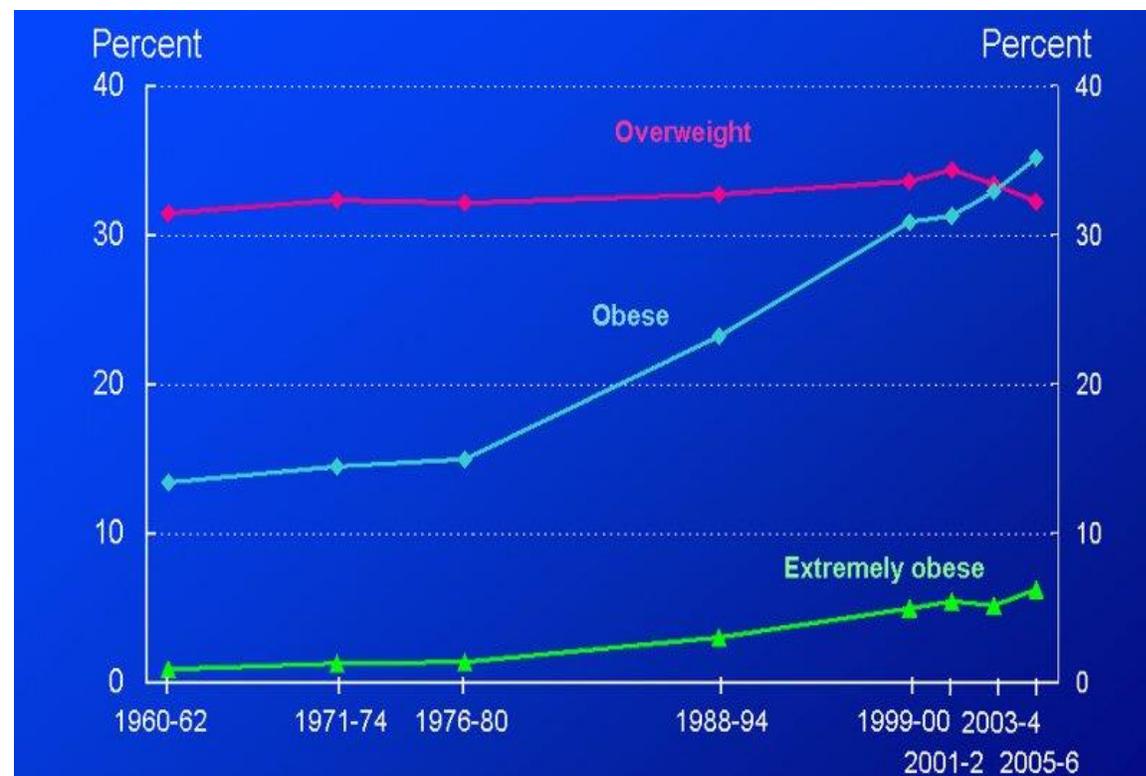
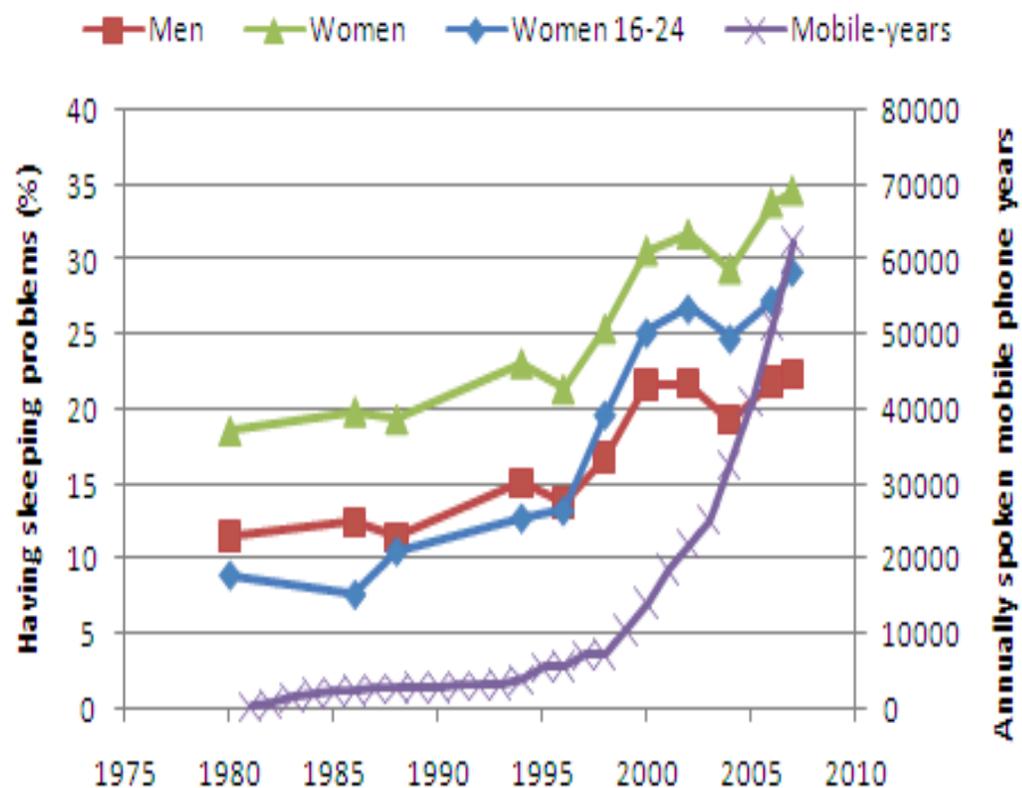


Sleep Deprivation = \leftrightarrow \uparrow Cortisol



Sleep Deprivation: 39% < 7 hrs. / night

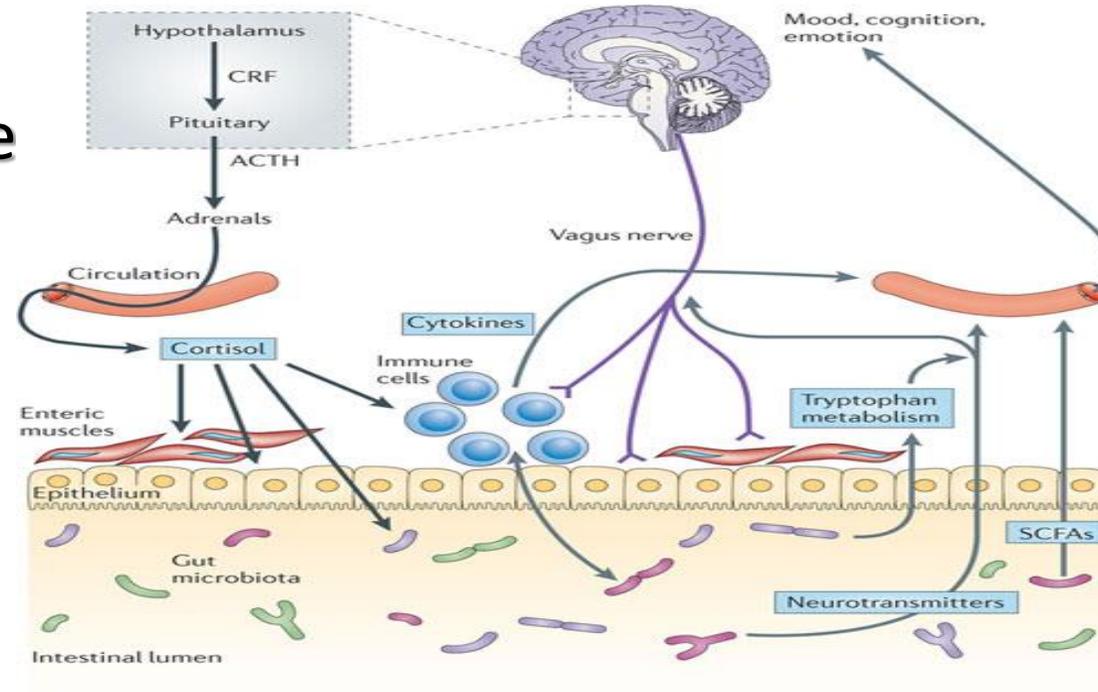
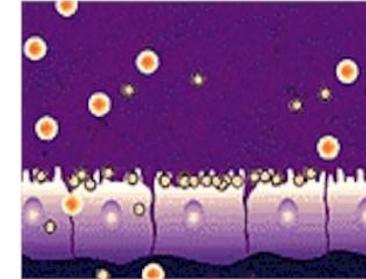
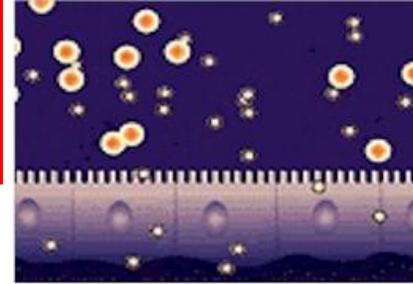
39% of Americans are obese



Cortisol → Gut Bacteria

(Dinan '12; Ridlon '13)

- Harm friendly bacteria
- Depresses immune system
- Inflammation
- Weight gain

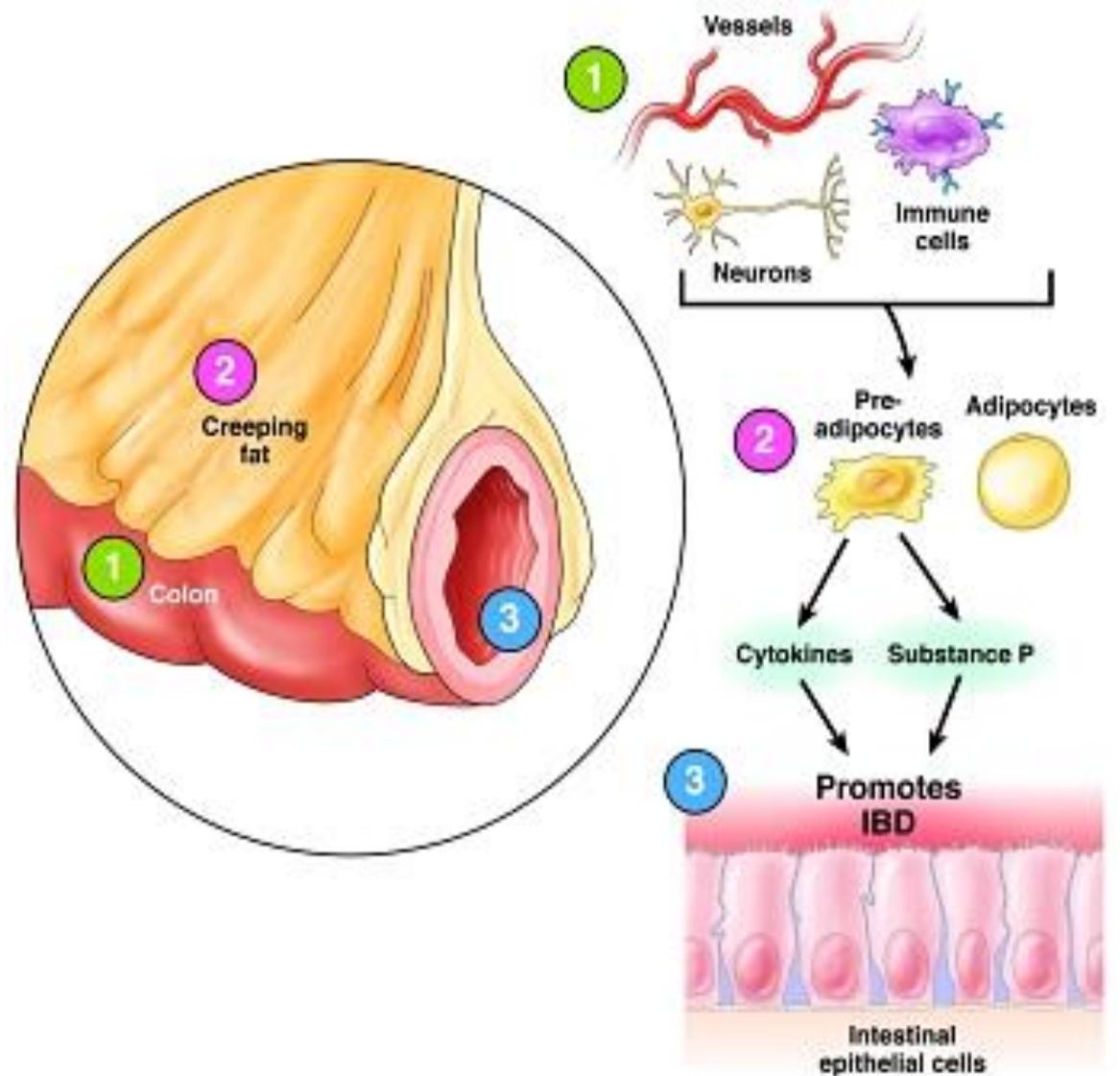


Nature Reviews | Neuroscience

Intra-abdominal fat (Creeping Fat): Inflammation

(Pothoulakis '15)

- Substance P mediates pro-inflammatory cytokine release from mesenteric adipocytes in
 - Inflammatory Bowel Disease patients (IBD)
 - Crohn's Disease
 - Ulcerative Colitis



Negative Body Image → Cortisol

(Putterman '06)



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People

Us WEEKLY

access hollywood

Star

inTouch WEEKLY

Life & Style

OK! MAGAZINE

SHAPE Magazine

Social Media → ↑ Cortisol
(Pozner '10)



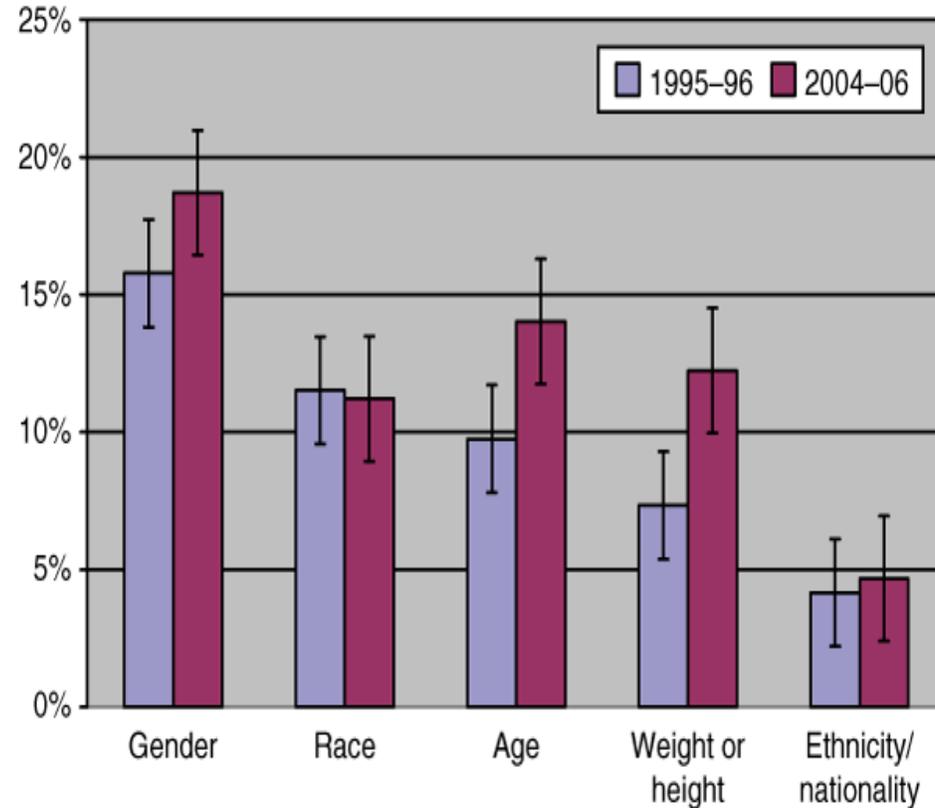
Failure → ↑
Cortisol



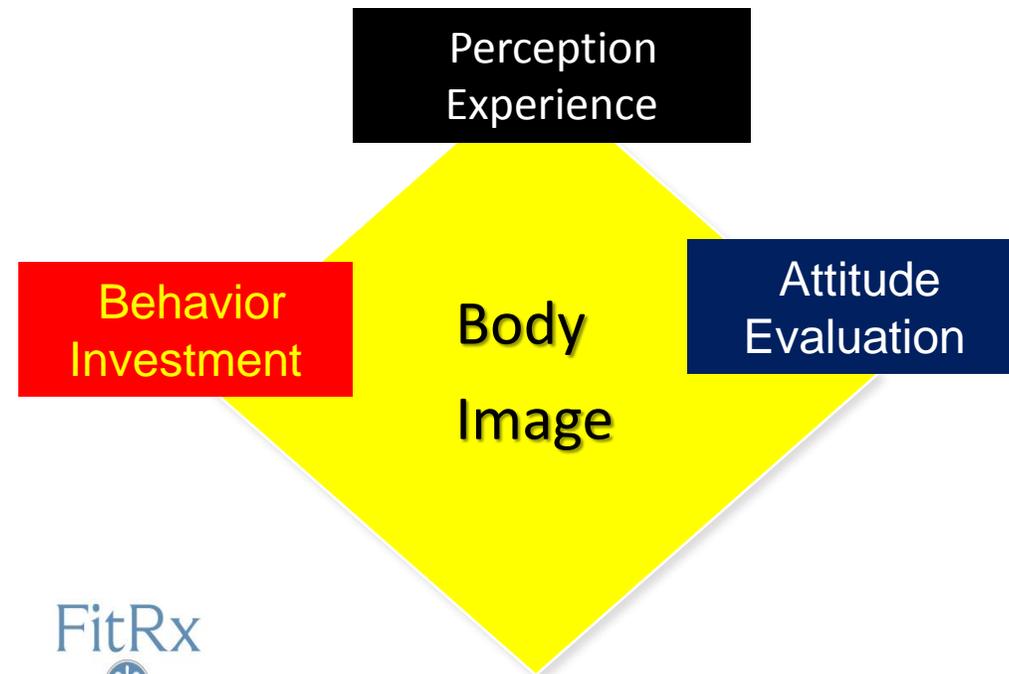
Discrimination, Bias, Stigma → ↑ Cortisol

(Fuller-Rowell '12; Latner '03; Nurmark-Sztainer '02; Storch '06)

- Name Calling
- Teasing
- Derogatory remarks
- Stereotyping
- Bullying
- Social Exclusion
- Rumors



To change the way you look
You need to change the way you see
and to Change the way you feel



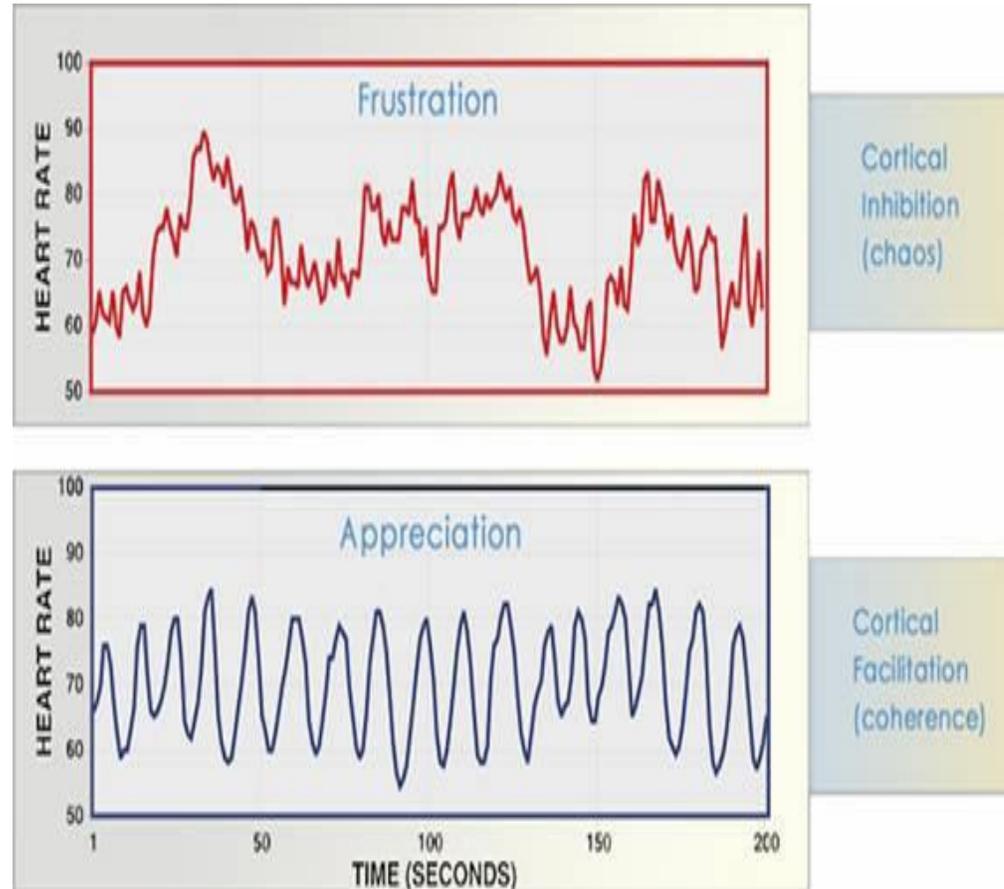
Affect Regulation

- **50% of bingers have clinical depression** (Borges '01)
- **42% stopped bingeing when prescribed antidepressants** (Stefano '08; Kaye '05)
- **Reports of stress before a binge were mitigated following the binge** (Faris '08)

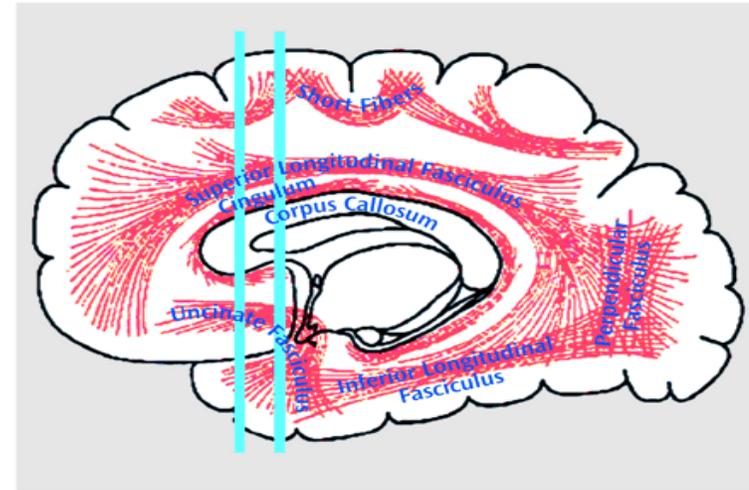


Calming the Amygdala → ↓Cortisol

- ↓ Fear by:
 - ↑ Self-confidence
 - ↑ Resilience
- Mindfulness and Loving-Kindness Meditation
 - ↓ Anxiety & cortisol



**Insecure
Attachment** → ↑ **Cortisol**
(Gunner '98)



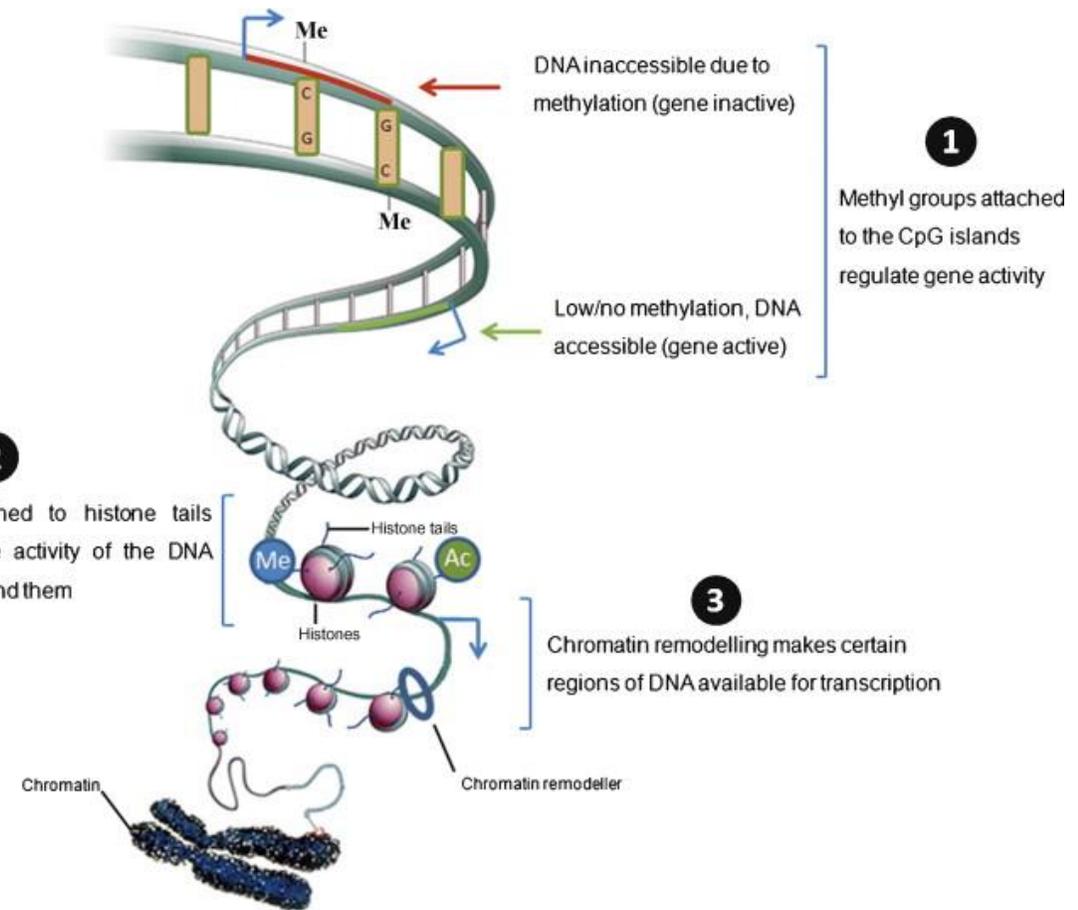
- Secure attachments →
↓ **cortisol** (Gunner '98)
- Attachment-based
psychotherapy → ↓
cortisol (Bakermans-Kranenburg
'08)



Nurture trumps Nature

(Weaver 04; McGowen '09; Meany '93; Zhang '10)

- Pups **born to** neglecting mothers but **raised by** nurturing mothers (lick/groomed)
 - Grew up resilient
- Pups **born to** nurturing mothers, but **raised by** anxious and neglectful mothers
 - Grew up fearful
- Methyl group Silences the gene expression (epigenetics)
- Nurture (environment)
 - Anxious mothers raise anxious offspring
 - Neglected offspring grow up anxious

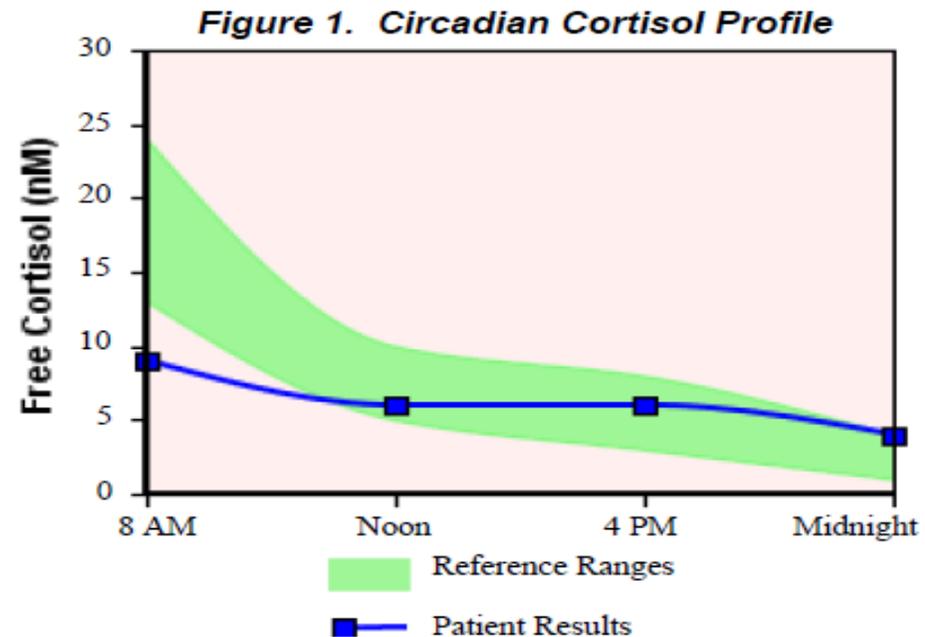


- The amount of nurturing baby mice receive from mothers determines placement of oxytocin receptors in the brain (Kingsley '06).

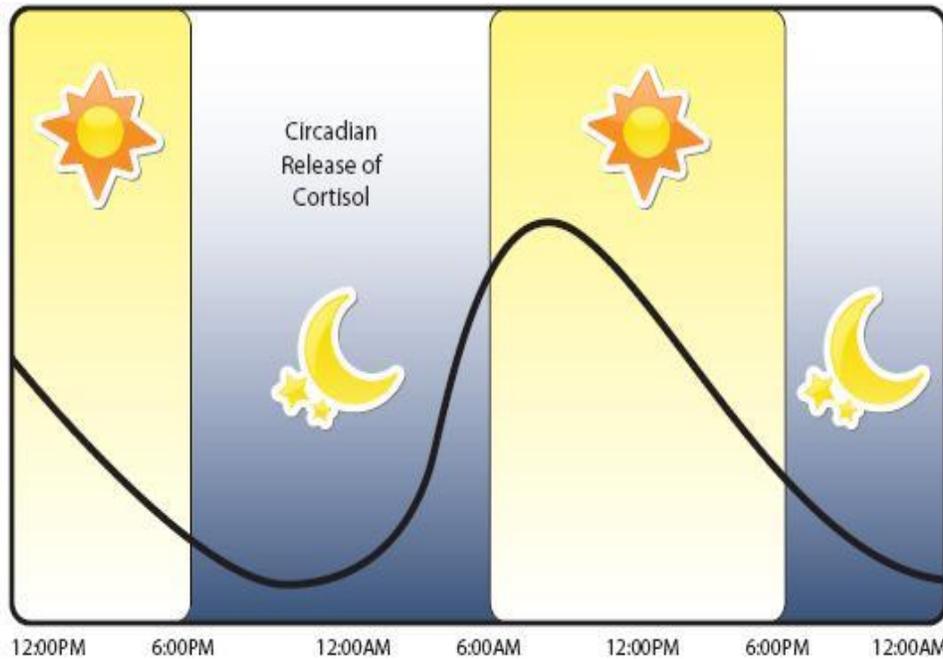
Trauma → ↓↓ Cortisol

(Kubzansky '13; Rainnie '09; Scaer '01, '05; Van der Kolk '85)

- 1/9 women have PTSD @ some point in life
- 36% increased risk of becoming > “natural size”
- Long term exposure to stress exhaust adrenals

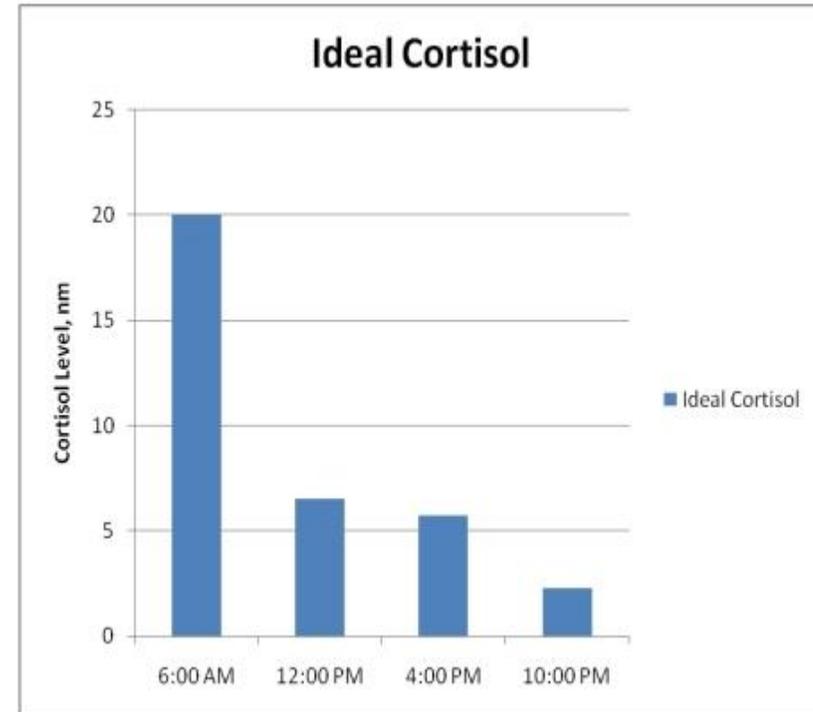


Cortisol: Circadian Rhythm



www.DrLam.com

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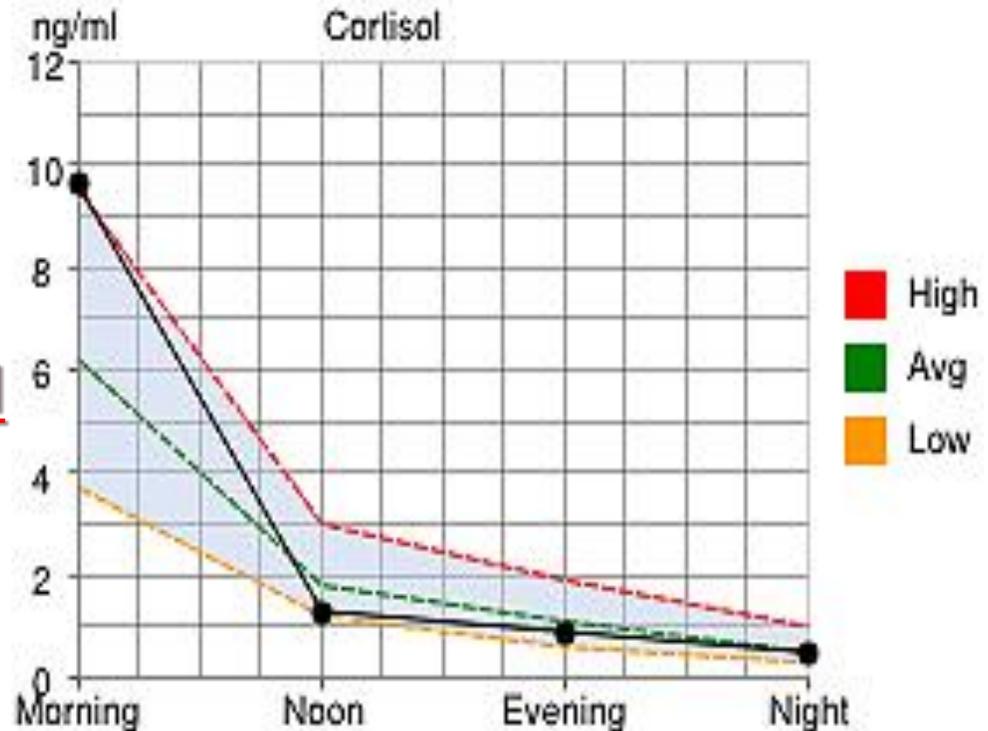
FitRx



Nashville, TN

Measuring Cortisol

- Salivary cortisol
- Urinary cortisol
- Cortisol awakening response
- 24 HR urinary free cortisol
- Diurnal cortisol
- Cortisol scalp hair
- Dexamethasone Suppression Test (DST)

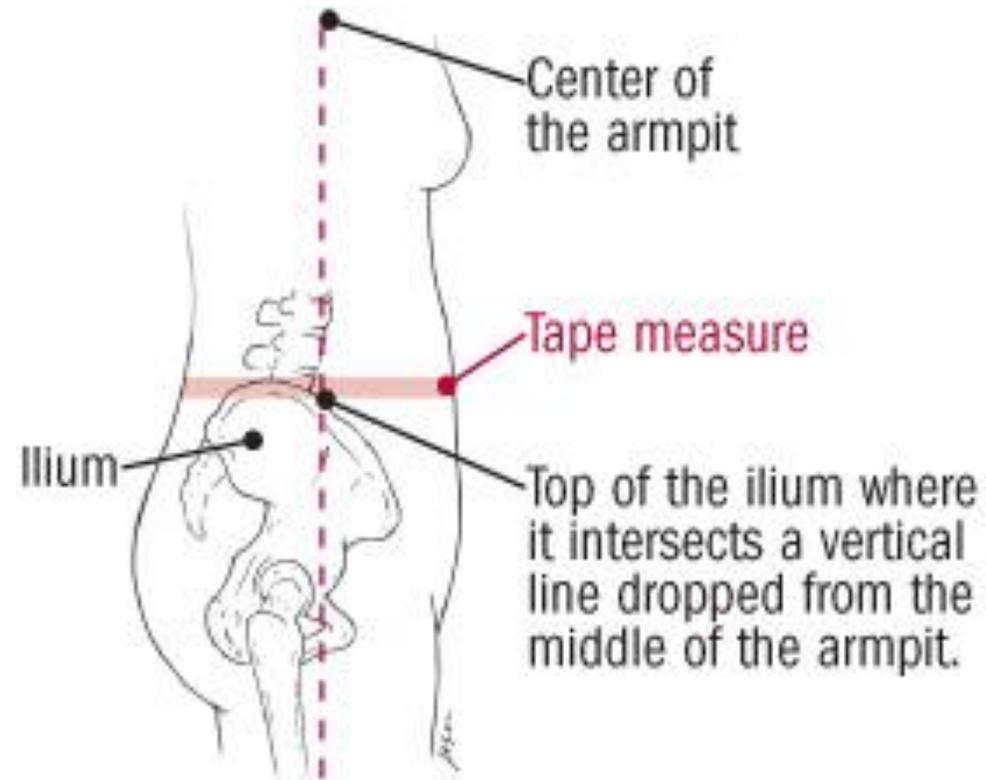


- **hsCRP** correlated with belly fat
 - < 1 mg /L lower risk
 - 1 – 3 mg/L moderate risk
 - > 3 mg/L higher risk
- ↓ weight 18 lbs = ↓ **CRP** 26%
- **TG/HDL** > 4 → ↑ belly fat
- **Insulin** > 15 uU/ml → ↑ Belly fat
- Obese + Insulin < 10 uU/ml + TG/HDL < 2 → heart attack risk low

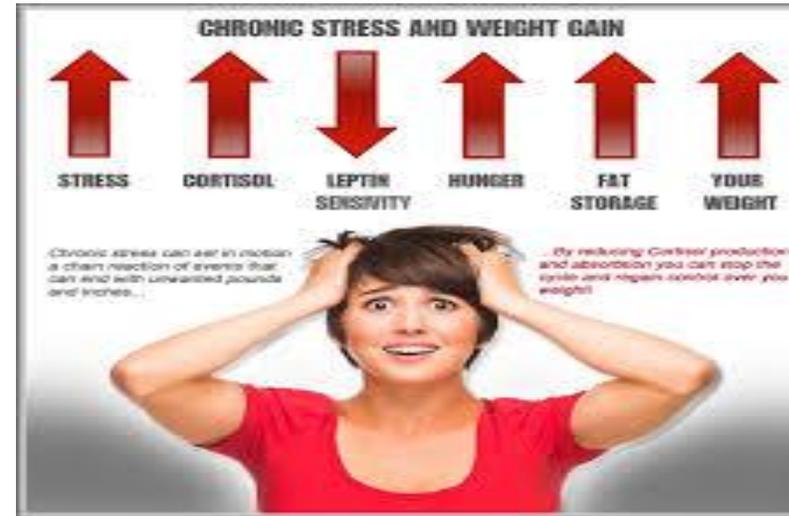
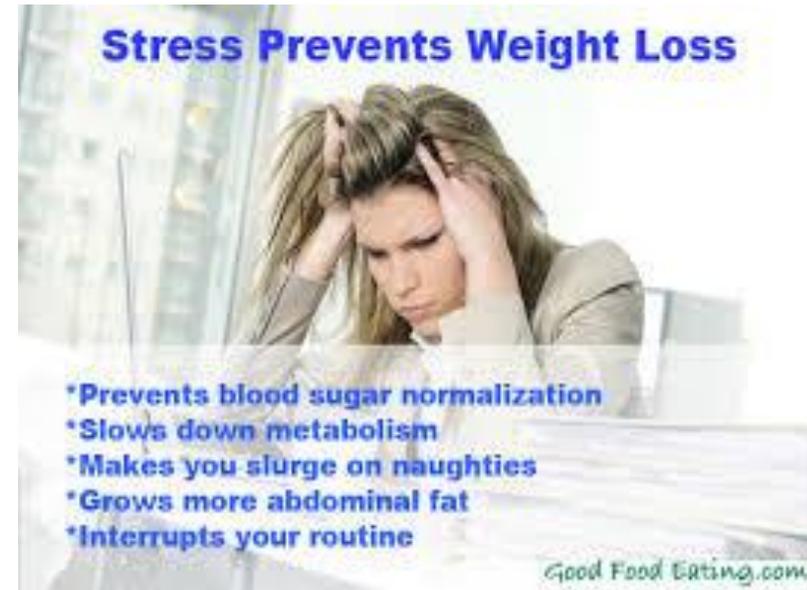
Sed rate (ESR)	γ' fibrinogen =	• High WBC	RBP4, vaspin,
Men: 0-15	0.622	• Low albumin	chemerin,
(mm/hr)	1 mg/L CRP =	• lipoprotein-	fetuin-A,
Women: 0-20	↑ 1.9%	associated	omentin, and
mm/hr	γ' fibrinogen	phospholipase	progranulin
		A2 (Lp-PLA2)	Adiponectin
			negatively
			correlated

Measuring Waist Circumference

- **Women: < 35 inches**
- **Men: <40 inches**
- **An Extra 4" ↑ risk of dying 15% – 25%**



• **Average Psychosocial stress** has **little long term effect on weight**
(Wardle '11)

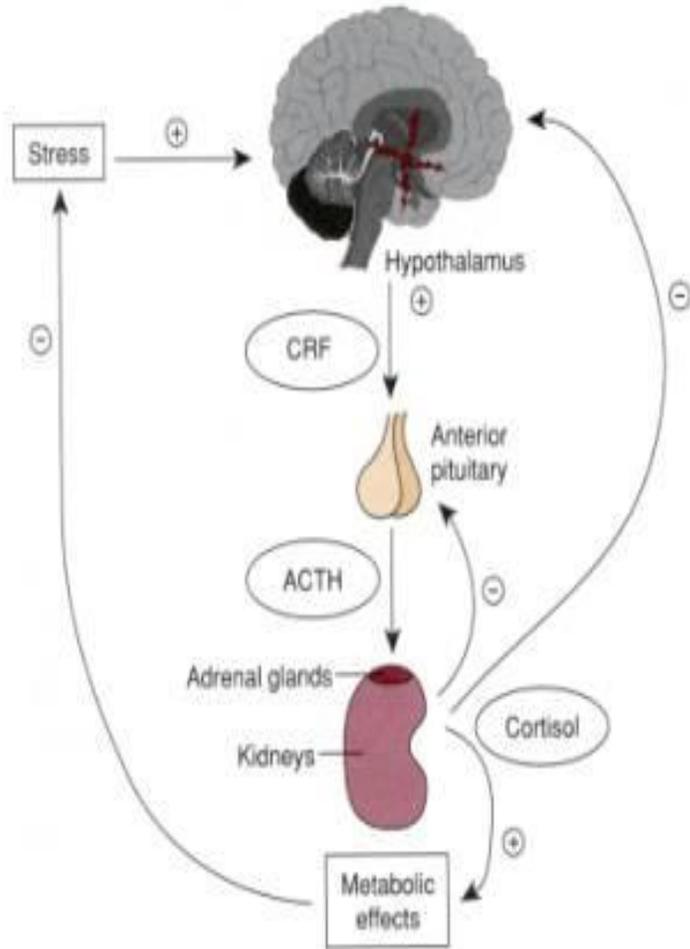


Stress Slows a Woman's Metabolism and Leads to Weight Gain

(Kiecolt-Glaser '15)

- **Burned 104 < less calories in 7 hours after eating if experienced stressful bouts 24 hours earlier**
 - **Projected to gain 11 lbs. per year**
- **Higher levels of insulin (↑fat storage)**
- **More likely to eat the wrong foods**





- “Fight or Flight”

- Adrenalin

- “Stew and Chew”

- Cortisol

- Conditions that cannot be duplicated
- Total focus is on weight everyday
- Access to every resource possible
- Incredible reward incentives
- **Acute Stress**





I am the
95%
of dieters who
regain the weight



\$4
million



Obesity is not the problem, Fat is not the Enemy

- **Assumed to be a disease?** (Medicare '04; AMA '13)
- **Assumed due to Poor choices; Character defect; Lack of will power**
- **Toxic environment replete with processed foods?**
- **Assumed to be due to eating too much?**
- **Assumed due to be tp exercising too little?**
- **A cascade of biological responses in one's body designed to thwart weight loss and return one to their pre-diet weigh**

The Inner Transformation Philosophy

- FitRx makes **no assumptions** about what you weigh
- FitRx does not stand **in judgment** about whatever you hope to weigh today
- FitRx has switched the **emphasis to health and well-being** and believes you can get to where you want to be through healthier practices
- **People of size:** Referring to people of the entire continuum = Weight Neutral
 - FitRx treats all people including those at the higher continuum



Why Diets are not the Solution

- Anxiety, Guilt, Rebellion
- Lack of satisfaction
- Food preoccupation
- Trigger emotional eating
- Rebound effect
- Future weight loss resistance
- Detriment to health
- False Hope
- Lapse, Relapse, Collapse
- **Binge eating disorder**



Finding Inner Transformation

FIGHT	FLIGHT	REST	DIGEST
STEW	CHEW	TEND	BEFRIEND
TIRED	WIRED	ATTITUDE of	GRATITUDE
		BELIEVEABLE	HOPE

How Do You Lower Your Cortisol?

How Can You Lower Your Cortisol in < 10 seconds?



Oxytocin → ↓ Cortisol

(Tops '12; Keating '13; Ditzen '09; Davidson '13)



Hugs → ↓ Cortisol

(Mooney '95; Grewen '03; Light '04; Fields '05; Sumiakura '13)

- Heartfelt
- 9 ½ seconds (Forsell '12)
- 12 hugs/day

H.U.G.G.S. ©
How You Get a
Grip on Stress



FitRx



Nashville, TN

Mental Reappraisal Techniques Moving from Habitual to Thoughtful

(Dallman '09)

- **Stress-response network (Cortisol)**
 - ↑ Emotional activity
 - ↑ Food desire, intake, weight gain
 - ↓ Executive function: Control
 - ↑ Stress response reinforce feeding habit
- **Before you consume a decadent desert, tell yourself:**
 - “I’m going to enjoy this!”
- **Relaxation boost the rate you metabolize food**
 - Do not trigger stress response network



The Obesity Cure

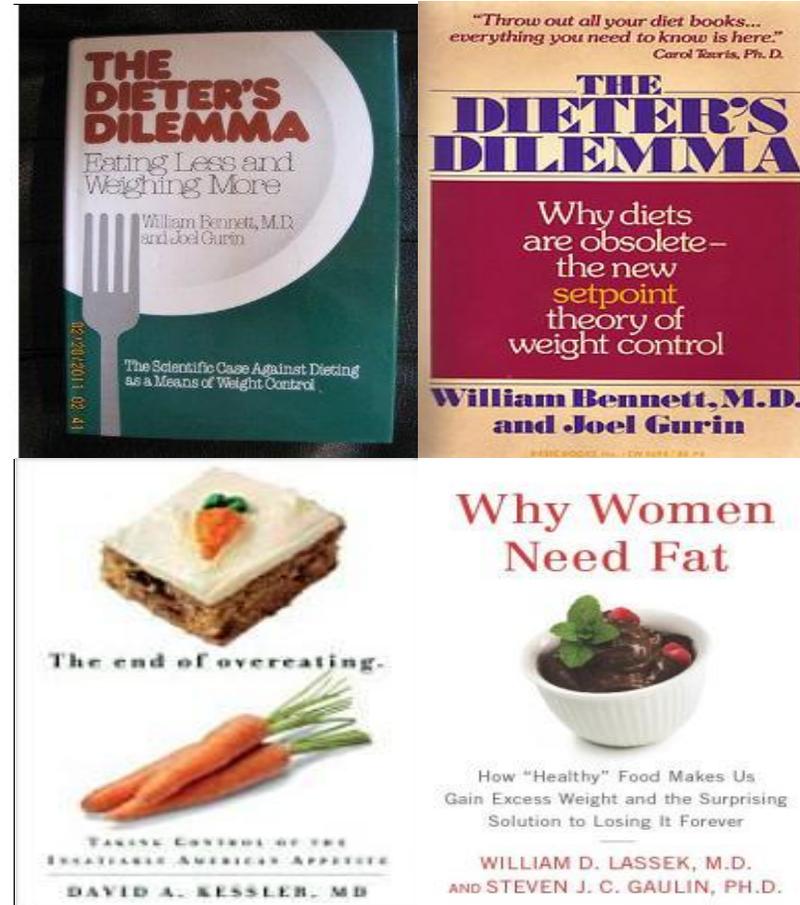
**And What to Do Now While We Wait
for it to be Discovered!**

**Ralph E. Carson, PhD
Executive Directive FitRx
rcarson@bellsouth.net**

How Successful is Dieting?

(Barrett & Gurin '83; Kessler '09; Lassek & Gaulin '12)

- 30% population dieting
- 2 in 5 quit first 7 days
- 1 in 5 quit first month
- Only 20% make it 3 months
- 30% dieting to maintain
- 95% success rate 1974
- 95% 40 years later 2014
- Gain 11 lbs. per diet

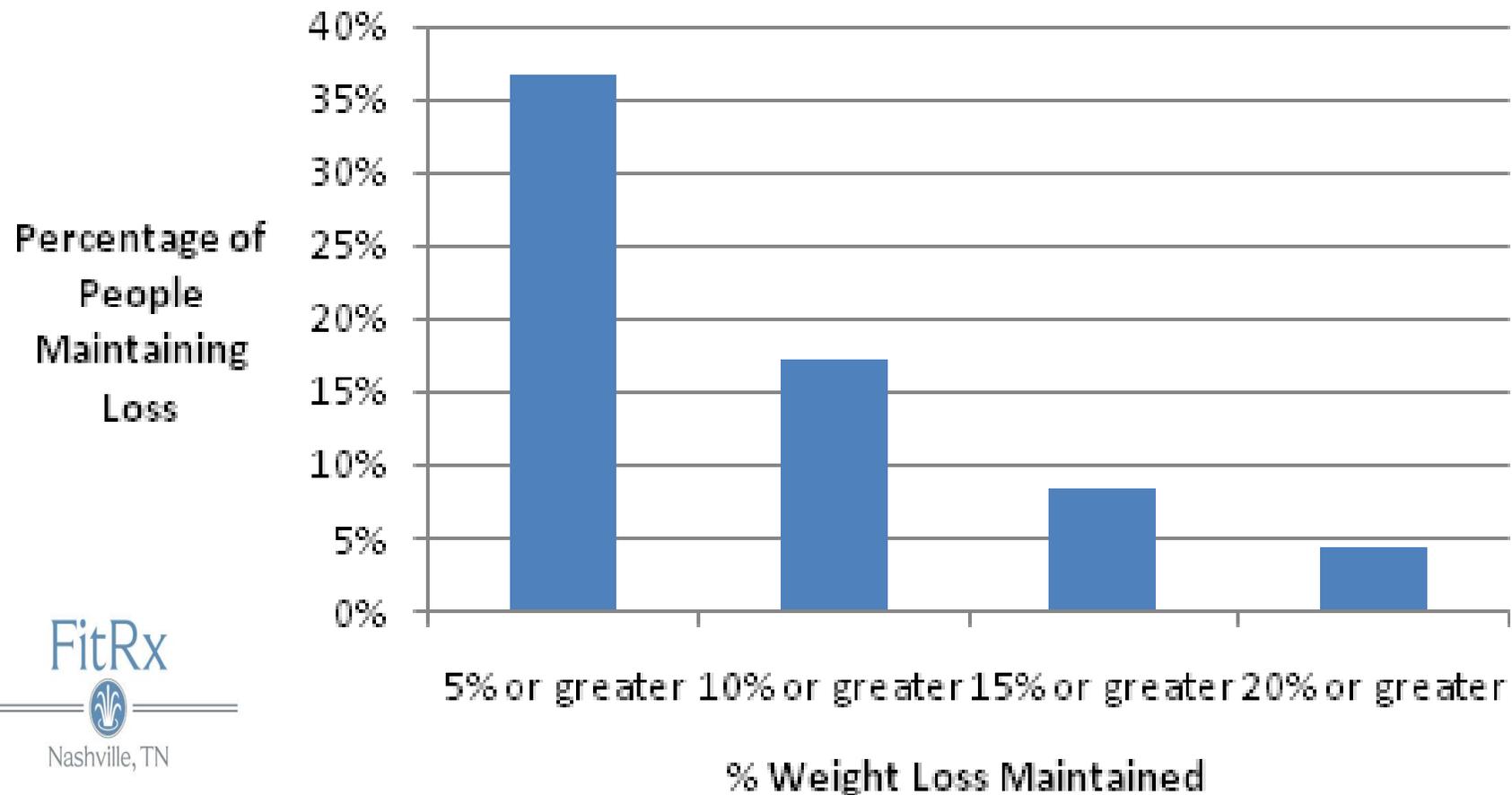


NHANES: 1999 - 2006

14,306 People

Kraschnewski JL Int J Obes (2010) 34: 1644 – 1654

Long Term Weight Loss Success



LONG TERM WEIGHT LOSS SUCCESS?

(Wing RR Am J Clin Nutr (2005) 82: 222S – 225S)

“Defined as losing at least 10% of initial body weight and maintaining the loss for at least 1 year”



5 Year Success Rate?

2% - 5%

Losing at least 10%
of initial body weight

Stunkard AJ Arch Int Med (1959) 103: 79 - 85

Kassirer J N Engl J Med (1998) 338: 52 – 54

Anderson JW Am J Clin Nutr (2001) 74: 579 – 584

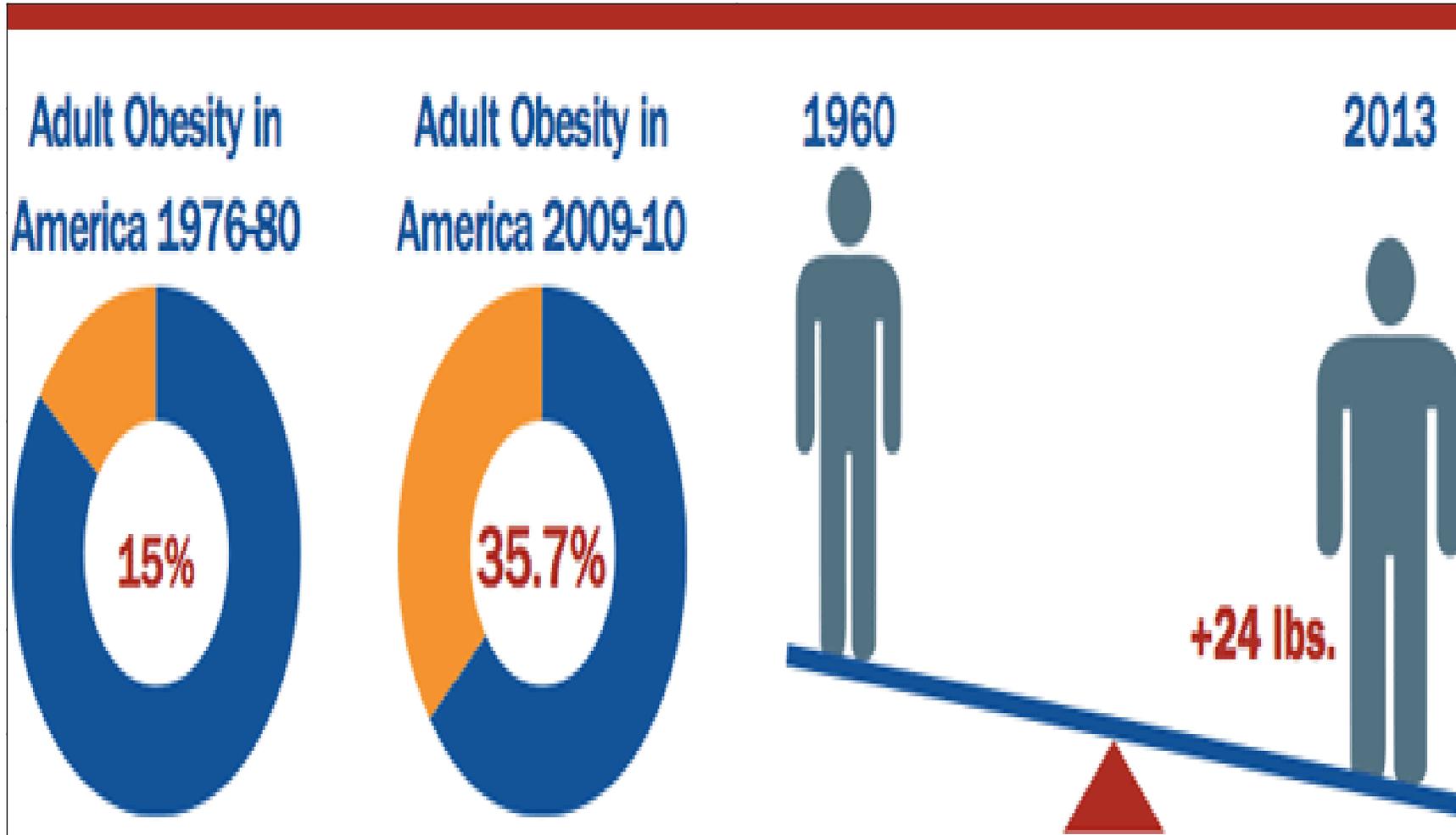
Wing RR Am J Clin Nutr (2005) 82: 222S – 225S

Franz MJ J Am Diet Assoc (2007) 107: 1755 - 1767; CDC (2007)

Stubb Obes Facts (2011) 4:113 - 120



The Rise in obesity: Is There an Obesity Epidemic?

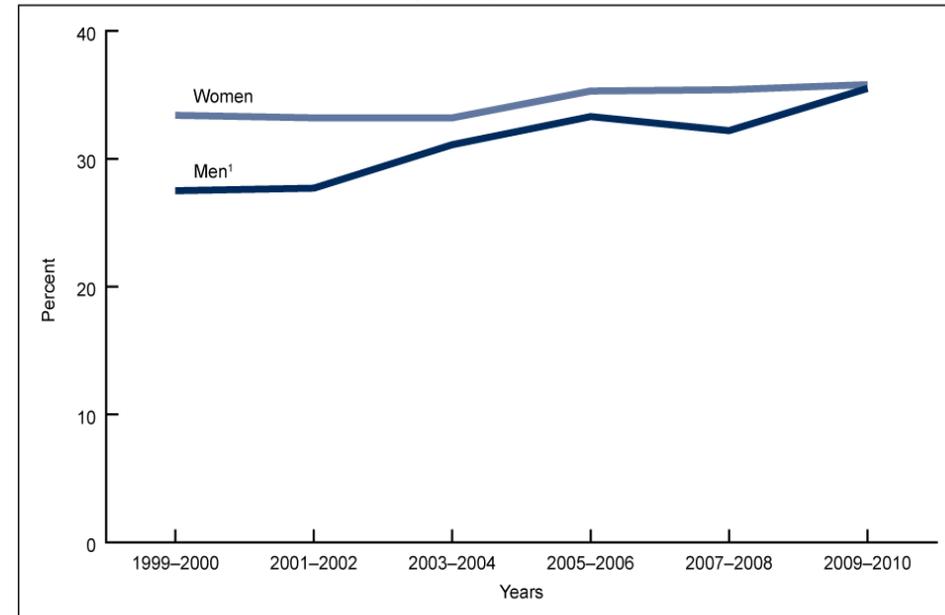


Has the Obesity Epidemic Slowed?

- 2009 – 2010
 - 35.7% obese
- 2011-2012
 - 34.9% obese
- 2003 – 2013
 - **Not much change**



Figure 4. Trends in the prevalence of obesity among adults aged 20 and over, by sex: United States, 1999–2010



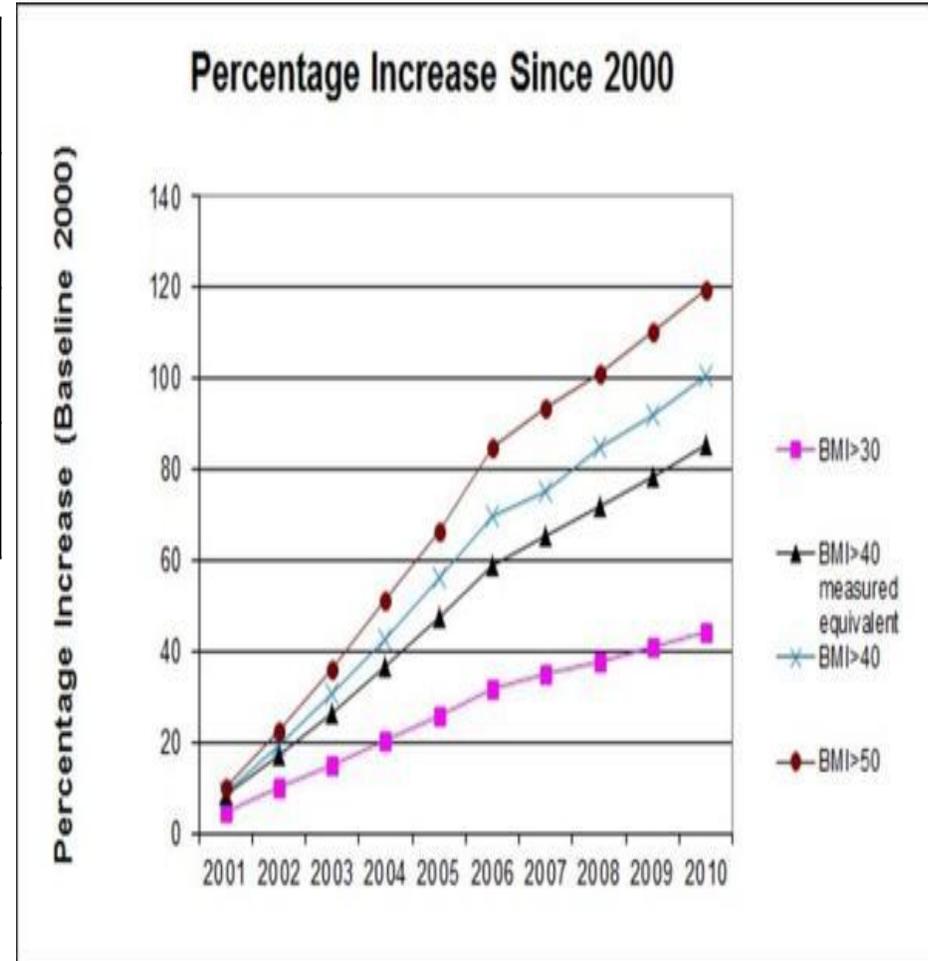
¹Significant increasing linear trend 1999–2000 to 2009–2010 ($p < 0.0001$).
NOTE: Estimates were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20–39, 40–59, and 60 and over.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

Morbid Obesity

(Sturm '13)

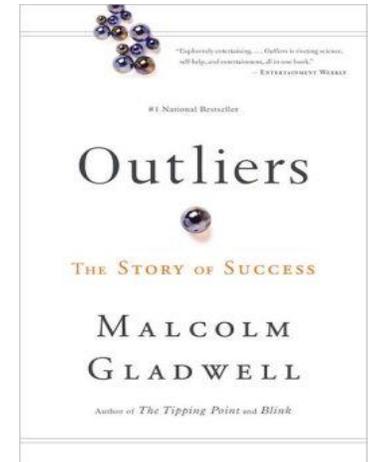
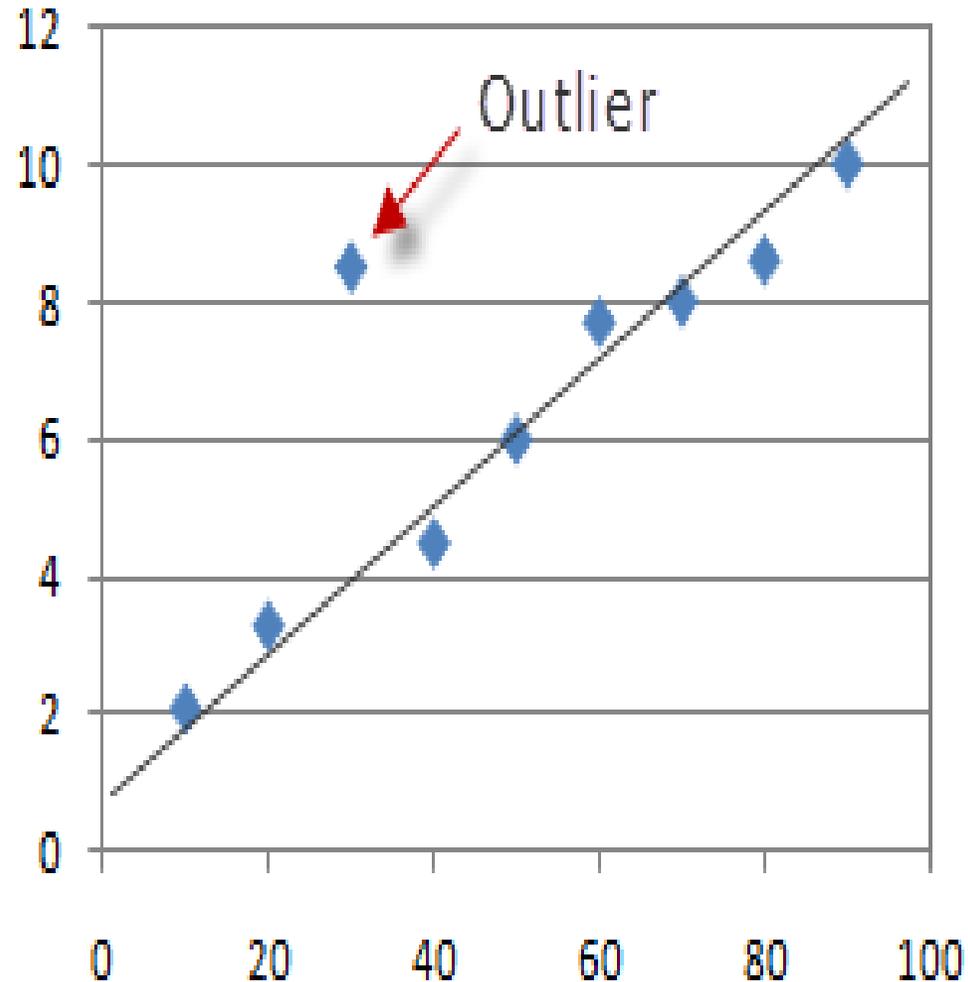
1980	1 in 200	0.5%
1994	1 in 50	2.0%
2004	1 in 25	4.0%
2010	1 in 15	6.3%

- Slowed down since 2005
- 2030: 1 in 9 or 11%



Outcomes

- **Still overweight**
 - Resolved it is hopeless
- **Finally lost weight**
 - Constant struggle
- **Successful**
 - Perfect Program?

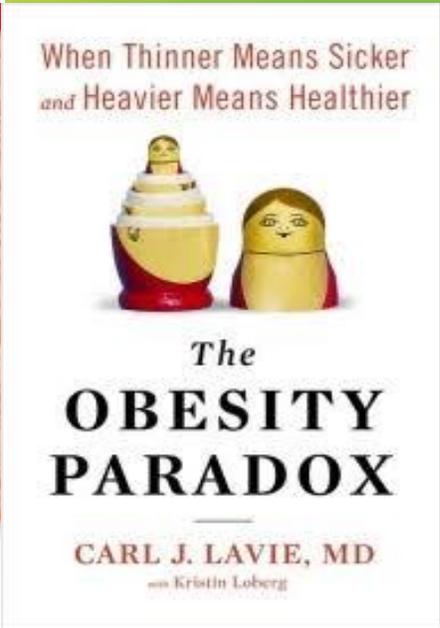
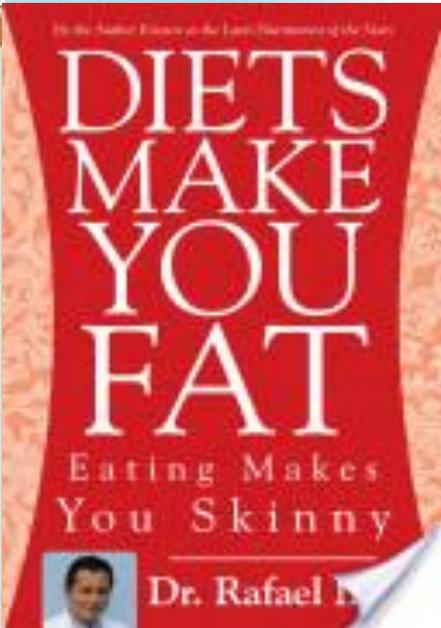
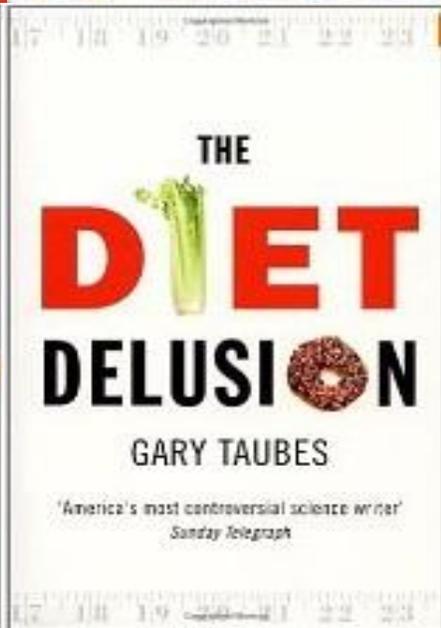
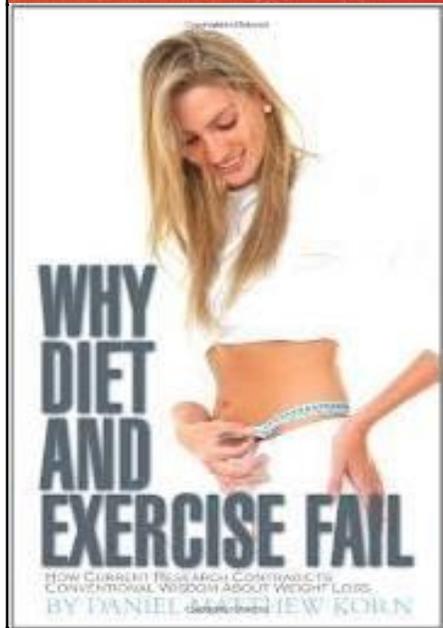
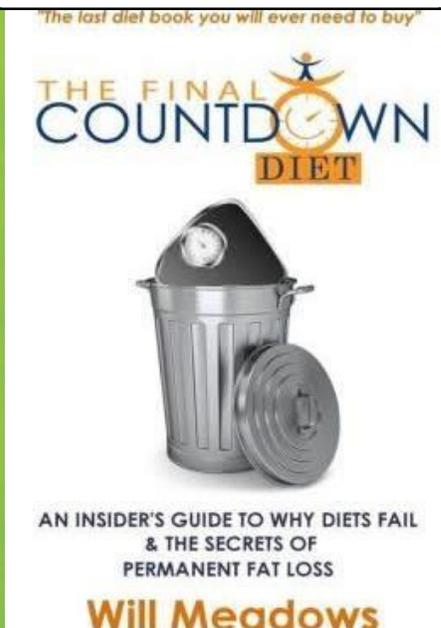
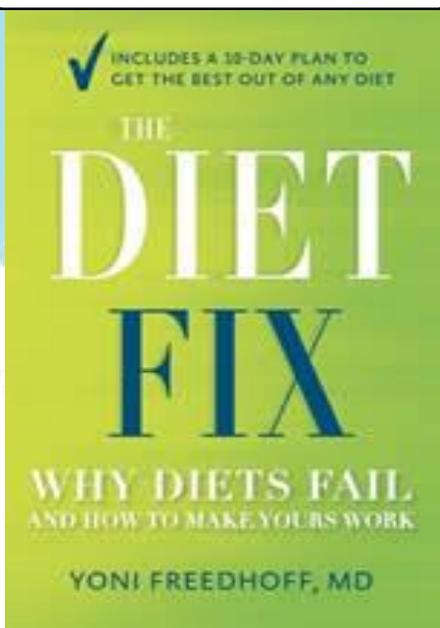
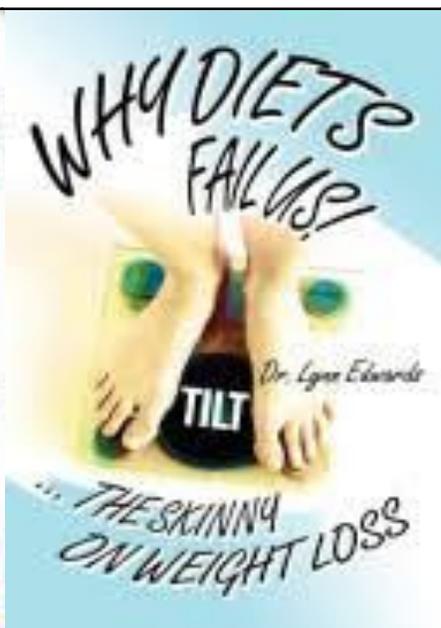
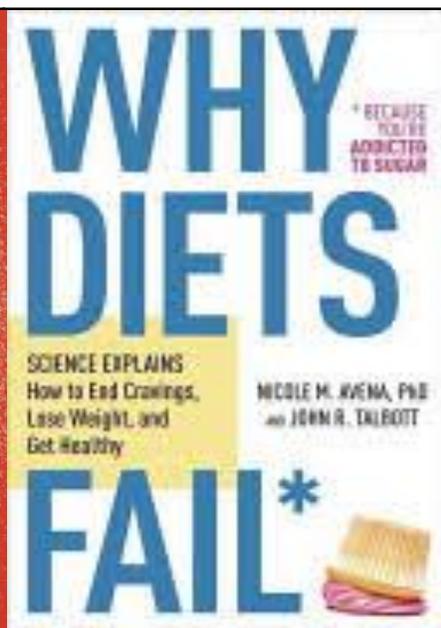
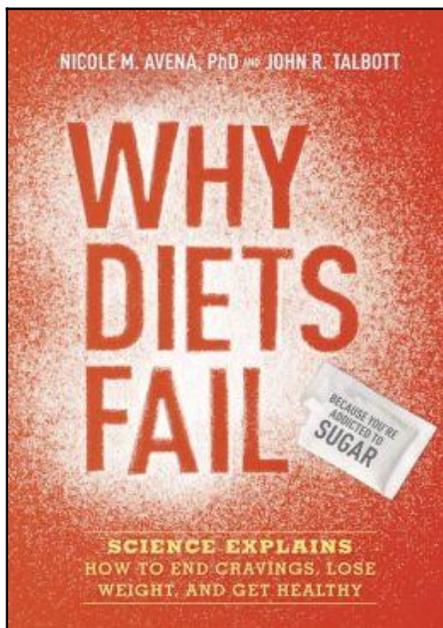


Prepare for the Pill to Make You Thin

Catherine Ostler, January 22, 2015

- Vyvance: BED (January 2015)
- Maestro Rechargeable System (January 2015)
 - Vagal Stimulation
- Saxenda: GLP-1 (Dec. 2014)
- Contrave: Bupropion & Naltrexone (September 2014)
- Qysmia: Phentermine and Topiramate (July 2012)
- Belviq: Fenfluramine (June 2012)
- Gastric Sleeve (2001)
- Orlistat (Alli): Xenical (1999)
- Phentermine, Fastin, Adipex (1959)





Why Diets Fail

US News and World Report, January 2015

- **Diets are too restrictive**
 - “Meet you where you are at ... not where you should be!”
- **Diets are not goal oriented**
- **Calories in; Calories out is out dated**
- **Support Systems are an integral part of success**



Mary Heyman; Jenny Craig, Jessica Bartfield, MD, Dietitians; SHAPE; State Health Departments; Nicole Avena, PhD; ABC News;

- You see your diet as a temporary fix, not a lifestyle change
- Underestimating Calories Consumed
- Overestimating Activity and Calories Burned
- Poor Timing of Meals
- Inadequate Sleep
- You use willpower instead of science to control your appetite
- You focus on calories (eating less and exercising more)
- You eat a low-fat diet
- Commitment issues
- Diets can be expensive
- You don't have a plan
- You feel hungry all the time
- Diets make you tired
- You become impatient
- You give up after a slip up
- Diets cannibalize your muscle
- Your metabolism has slowed down
- Cravings
- Social Pressure
- Diets often don't fit into normal life
- It requires physical activity as well
- You addicted to sugar

