What We Will Cover

- Overview of fat burning
- Hormones versus calories
- Hormonal effects on belly fat
- Visceral versus subcutaneous belly fat
- Nutrition approaches for belly fat
- Exercise approaches for belly fat
- Lifestyle & Supplements for belly fat
- Belly fat protocols

Overview of Fat Burning

- Lipolysis
  - Fat Release
- Blood Flow
  - Fat Delivery
- Lipid Oxidation
  - Fat Burning

Fat Release

- Lipoprotein Lipase (LPL)
  - Fat storing enzyme
  - Stimulated by insulin, cortisol, ASP* & GIP
  - Increased by ghrelin
- Hormone Sensitive Lipase (HSL)
  - Fat burning enzyme
  - Stimulated by cortisol
  - Catecholamines (noradrenaline/epinephrine & norepinephrine/epinephrine)
  - Suppressed by insulin

Fat Release

- Insulin = “lock and key” hormone.
- Cortisol = fat loss or fat gain. Association with insulin determines which
- Excess insulin and/or excess cortisol = insulin resistance
- Insulin resistance = greater amounts of insulin= more fat stored & less fat released
- What happens to an insulin resistant person who goes on a low calorie diet?

Fat Release

- Catecholamines & Thyroid= hormonal metabolic engines
- Thyroid potentiates catecholamines
- Two types of receptors = Alpha & Beta
  - B = Beta for burn
  - A= Alpha for Anti-burn
- Fat release is determined to large degree by alpha:beta receptor density of the specific fat tissue
Fat Tissue Blood Flow

- **Blood vessel anatomy**
  - Visceral fat has greater blood flow
  - Sub Q fat blood flow & volume is less in insulin resistance

- **Capillary density**
  - Lowered in obese

- **Hormones**
  - Catecholamines dilate blood vessels

- **Heat**
  - Dilates blood vessels in periphery

Fat Burning

- **Entry into cell (LPL)**
- **Entry into mitochondria (CPT-1)**
- **Oxidation of fuel:**
  - Fat $\rightarrow$ Acetyl CoA $\rightarrow$ krebs cycle $\rightarrow$ burning
  - Carb $\rightarrow$ Oxaloacetate & Acetyl CoA $\rightarrow$ Krebs cycle
  - Protein $\rightarrow$ multiple entry points into krebs cycle
- **BCAA**
  - Gluconeogenic & ketogenic
  - Surrogate carbohydrates
  - Supress hunger, lower cortisol, build muscle

Fat burns in the fire of sugar?

Water Wheel Analogy

Calories or Hormones?

- Low calorie versus low carb diet?
- Low calories is low carb
- Calories impact hormones and hormones impact calories
- Calories first = slowed metabolism $\rightarrow$ weight loss (muscle & fat) $\rightarrow$ hunger $\rightarrow$ cravings $\rightarrow$ energy fluctuations $\rightarrow$ compensatory eating $\rightarrow$ increased calories
- Hormones first = efficient metabolism $\rightarrow$ fat loss $\rightarrow$ no hunger $\rightarrow$ reduce cravings $\rightarrow$ balance energy $\rightarrow$ unconscious lower calories

Compare

- **Doughnut (bruller)**
  250 calories
  - 20g fat
  - 18g carbohydrate
  - 2g protein

- **Chicken (skin on)**
  251 calories
  - 11g fat
  - 2g carbohydrate
  - 37g protein

Hunger? Cravings? Energy?
Intro To Hormones

Hormones ultimately determine fuel used (sugar or fat burner)
Where fat is stored (cortisol)
Hunger, satiety, cravings, mood, energy, health, motivation
How many calories does sleep have?
How many calories does stress have?

Hormonal Epigenetics

Choices → Hormones → Gene Expression (epigenetics)
Choices → Disrupted Hormonal Messaging → Altered Gene Expression → Obesity/Belly Fat

Hormonal Metabolism

- Leptin (fuel gage)
- Cortisol
- Insulin
- Glucagon
- Adrenaline
- Thyroid
- Growth Hormone
- Testosterone

Hormones & Belly Fat

- Storing
  - Insulin, Cortisol, ASP, GIP, Ghrelin
  - Estrogen & progesterone
- Burning
  - Cortisol, testosterone, HGH, thyroid, catecholamines, glucagon
  - Estrogen & progesterone

Types of Belly Fat

Visceral Fat
- Deep
- Underneath muscle
- Can’t pinch

Subcutaneous Fat
- Superficial
- Under skin
- Can pinch

Why do we store where we store?

Could it be hormones?

- Estrogen progesterone
  - Hips, thighs, butt & bust
  - Narrow waist
  - Estrogen= more alpha receptors

- Testosterone
  - Lean arms, legs & pecs
  - more beta receptors in middle
Insulin

- Insulin in fat = Store and lock
  - Resistant: less storage & more burned
  - Sensitive: increased store & lock
- Insulin in muscle = increased fat/sugar burn & muscle build
  - Resistant: inability to burn fats/sugars. Sensitive: stores fat and builds muscle
- Insulin in brain = Decreased hunger
  - Resistant: constant hunger. Sensitive: less hunger
- Insulin in liver = Decreased glucose & increased glycogen
  - Resistant: increased blood sugar & less glycogen
  - Sensitive: decreased glucose production & more glycogen

Insulin & Cortisol

- Both stimulate LPL
- Both cause insulin resistance in high amounts
- Insulin magnifies cortisol’s LPL activity
- Insulin blunts cortisol’s HSL activity
- Insulin resistance = hunger
- Excess cortisol = cravings
- Insulin & cortisol together = blood sugar issues
- Storage of fat around middle

Cortisol

- Jeckyl & Hide Hormone
- Increases LPL = fat storage
- Increases HSL = fat release
- Causes insulin resistance
- Causes cravings
- 11 beta HSD-1
  - Inc. local cortisol production
  - More in visceral fat

Insulin & Cortisol

Food & Stress
- Hunger & Cravings
- Blood sugar regulation
- Belly fat Storage

Females

- Estrogen = anti-insulin & anti-cortisol
- Progesterone = anti-cortisol
- Both decrease spread of fat around middle
- Post Menopause = increased belly fat storage
What’s the difference?

Visceral fat:
- more blood flow
- more beta receptors
- more insulin resistant
- self-perpetuating/disease risk
- more exercise responsive

Sub-cutaneous fat:
- less blood flow
- more alpha receptors
- more insulin sensitive
- more stubborn
- diet is key

Visceral Belly Fat
- More easily burned
- Easy to lose through exercise
- Self-perpetuating
  - Fat cells secrete inflammatory mediators
  - Inflammatory mediators worsen insulin resistance
  - Insulin resistance enhances fat storage
  - PARASITIC BELLY FAT

Subcutaneous Belly Fat
- Less blood flow
  - Periphery is colder
- More insulin sensitive
  - First on & last off
- Less exercise responsive
  - More adrenergic receptors
- Much more tightly related to diet
- More health, less inflammatory

Adrenergic receptors
- Control blood flow
  - beta= blood vessel dilation
  - alpha= blood vessel constriction
- Control fat release
  - beta = enhance fat burn
  - alpha = slow fat burn

**More alpha = less blood flow & less fat release= stubborn & unresponsive fat**

Belly Burning Foods?
- Control hunger, energy & cravings (HEC)
  - Lower calories
  - Hormonal balance
  - High in water, fiber and protein
  - Lower in starch and fat
Food Effects

- Food
  - Starch/Sugar = insulin
  - Protein = insulin & glucagon
  - Fat = ASP
  - Fat + Starch/Sugar
    - ASP = insulin
    - Insulin = ASP
    - BELLY FAT STORING ATOMIC BOMB

To Eat Or Not To Eat?

Eating Frequency?

- Cortisol increases in susceptible people
  - See-saw tipping?
  - Increased craving?
  - Insulin?
  - Muscle?
  - Energy?

- Ghrelin increases
  - Increased hunger
  - Increased LPL
  - YO-YO?

Fat & Starch

- What does Atkin’s & Vegetarian Diet have in common?

Word on “carbs”

- Better = Starch/Sugar Vs. Non-Starch/Fiber

Hormonal Effects of Carbohydrates
Hormonal exercise

- Stress
  - Fight or Flight
- Adrenaline, Cortisol
  - Inc. Blood Sugar
- Intense movement
  - Inc. Lactic Acid
  - HGH, Testosterone
  - Inc. fat burn, muscle growth, fitness

Belly Burning Exercise

- Burn Calories
  - All-exercise does it
  - Intense exercise does it best

- Optimize hormones
  - Short intense
  - Long & slow (leisure walking)

- Control HEC
  - Leisure walking no effect
  - Short intense—short term suppression
  - Long & Moderate intensity (power walking) = hunger

Exercise & Hormones

- Increased fat burning in belly fat after exercise
- Increases catecholamine release compared to aerobics of equal energy expenditure

Combination Workouts

- 2 groups did same workout in different order
  - Group 1: Weights followed by aerobics
  - Group 2: Weight training
- Intermixed group:
  - Bs and Hs
  - Increased Aerobic capacity 21.2% greater response
  - Lower body strength 16.7% greater response
  - Lower body endurance 52.8% greater response
  - Fat burning by 991.8%……WOW!!
  - Muscle gain (82.2%)
  - Faster recovery and less soreness
  - All other parameters were comparable.

Weight Training?

- Increases catecholamine release compared to aerobics of equal energy expenditure
- Increases fat burning after burn several days after exercise
- Increased fat burning in belly fat after exercise
- Decrease belly fat spread of aging in women
- Enhances cortisol:testosterone/HGH ratio
- Enhances liver & muscle insulin sensitivity
- Attenuates metabolic decline from dieting

Bs & Hs

- What Elevates After-burn? (Vs and Hs)
- Breathless: Corresponds with ability to talk (catecholamines)
- Burning: Metabolic failure (lactate, myokines, NO, HGH)
- Heavy: Mechanical failure (testosterone)
- Heat: Fever (polymers & catecholamines)
**Supplements**

- **Restore insulin sensitivity**
  - Alpha lipic acid
  - Chromium, magnesium
- **Control HEC**
  - Cocoa, BCAA, viscous fiber
- **Suppress excess cortisol**
  - Phos serine, BCAA, Yogi Bedtime tea (GABA herbs), post workout protein shake, Relora

**Belly Fat Formula?**

- \((SS + F) \times (St) = \text{Fat Belly}\)
  - SS = starch & sugar
  - F = Fat
  - St = stress = cortisol
  - sleep deprivation
  - hunger & cravings
  - Excess cardio too?

**Six pack formula**

- \((P + V) \times (SI + SE) = \text{Six pack}\)
  - P = protein
  - V = vegetable (less sweet fruit)
  - SI = sleep
  - SE = smart exercise
    - Leisure walking
    - Weight training

**Attain Diet**

- **Unlimited**
  - Lean protein
  - Non-starchy vegetables
  - Low sugar fruits
- **Limited**
  - Dairy as a condiment
  - Starchy carbs/sweet fruits (5-15 bites/meal or 15-45 bites/day)
  - Fats and fatty meats (limit 1-2 handfuls nuts per day)
  - Alcohol
  - 1 cheat meal

**Maintain Diet**

- **Unlimited**
  - Lean protein & Fatty protein
  - All Dairy foods
  - Non-starchy vegetables
  - Low sugar fruits
- **Limited**
  - Starchy carbs/sweet fruits (5-15 bites/meal or 15-45 bites/day)
  - Alcohol
  - 1-3 Cheat meals
Carb tipping point

- Too much = insulin & fat storage
- Too little = cortisol & poor performance
- Adjust by
  - Amount (bites)
  - Type
  - Timing

** The Art of Weight Loss**

Workout

- 3-4 mixed metabolic conditioning workouts per week
- 2-3 full body resistance training workouts per week
- Daily leisure walking as much as possible
- Blitz & Burst training
- NEAT

Metabolic Formula

Make note of HEC: “HEC imbalance” OR “HEC balance”
Weekly measure results: 1) Waist down 2) Waist up (Fx) 3) No Change
Goal is sustainable fat loss results= HEC balanced and waist reduction = Metabolic Formula
Adjust according to 6 scenarios:

1) HEC imbalanced & WD
   - Good results but not sustainable. Balance HEC
   - Increase Protein & Fiber

2) HEC imbalance & NC
   - Make sure not losing muscle
   - Add protein and fiber first to stabilize HEC
   - Carb tipping point

3) HEC imbalanced & WU
   - Check compliance
   - Raise protein and fiber to stabilize HEC
   - Lower carbs and/or fat

4) HEC balanced & WD
   - This is the metabolic formula for this client. DO NOTHING

5) HEC balanced & NC
   - Check Compliance (including exercise & lifestyle)
   - Raise protein
   - Carb tipping

6) HEC balanced & WU
   - Check Compliance (including exercise & lifestyle)
   - Lower Carbs & OR Fat

Food Verses Stress

**The Art of Weight Loss**

Start the day with a good breakfast (before exercise)
1,000mg tyrosine to ramp up catecholamine production (empty stomach
5) HEC balanced & NC

**Sticky Belly Fat Protocol**

**Diet:** A low-starch diet of less 125g per day of carbohydrates from all sources.

**Supplements:**
- Coleus Forskohli (Forskolin): 250mg/daily (standardized to 20% forskolin)
- Green tea Extract, 300mg/daily (standardized to 45% EGCG or more)
- 1 cup drip coffee or 150 to 200mg caffeine (empty stomach before exercise)
- 1,000mg tyrosine to ramp up catecholamine production (empty stomach before exercise)
- Yohimbine HCl (better than yohimbe bark)= 5 to 20mg (empty stomach only before exercise)
Stubborn Belly Fat Protocol

• **NOTE** Yohimbine can act as a stimulant and as a monoamine oxidase inhibitor (MAO inhibitor) raising the levels of serotonin, adrenaline and dopamine. Check with a physician especially if you are on mood medications.
• **NOTE** Insulin/food will inhibit activity of yohimbine so always take on empty stomach
• **NOTE** The combination of caffeine, tyrosine and yohimbine can be overly stimulating for some sensitive individuals. Mix and match the supplements according to your sensitivity & start with lower doses. All may not be required and while the protocol may be less effective without them, it will still be useful without their use.

Exercise Suggestions

• **Exercise Suggestions:** Start with 20 minutes of intense intervals or cardio-based weight-training (10 to 30 minutes) followed by low intensity walking for as long as feasible (preferably 60 to 90 minutes). This protocol is done 3 to 5 times per week and preferably on an empty stomach following a low-carb day (i.e. glycogen depleted exercise).
• **Protocol Cycling:** This protocol should be done in cycles lasting 4 to 7 days where you are “on the protocol” and 10 to 14 days or longer where you are “off the protocol”. The EGCG and Coleus can be used on or off the protocol, but the combination of other supplements should only be used for short periods of time while on the protocol.