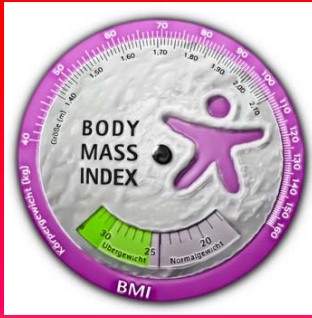




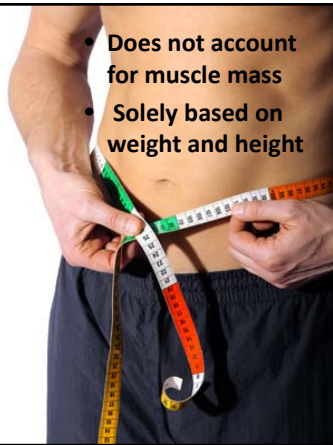
Weighing in on Obesity and Breastfeeding

Kathleen Kendall-Tackett, Ph.D., IBCLC, FAPA

- What is "obesity"?
- Based on the BMI
 - Body Mass Index
- Obesity is defined by the BMI



Problems with the BMI



- Does not account for muscle mass
- Solely based on weight and height



- Does not take into account where fat is located
 - Subcutaneous vs. visceral fat

- Contrary to popular belief, BMI is not a particularly great predictor of mortality or morbidity
 - But co-occurs with some of the factors that are



- Obesity
 - Obesitas
 - Having eaten until fat



- **Problems with obesity as a construct**
 - Pejorative
 - Imprecise
 - Inaccurate
 - Overeating is not the only cause



- **What causes weight gain?**



+



=



Takeru Kobayashi
The Tsunami




- **How much control do you really have over your weight?**



The Promises of a \$59 Billion Business




- Fat, like other systems, is exquisitely regulated
- Not a simple matter of calories in/calories out




Taubes, 2011, *Why we get fat*: Knopf

- Our bodies are wired to maintain a certain amount of fat and will go to extreme lengths to preserve it
 - When calories are restricted, we conserve energy
 - When we accumulate excess fat, it tells us that something has gone awry in the system

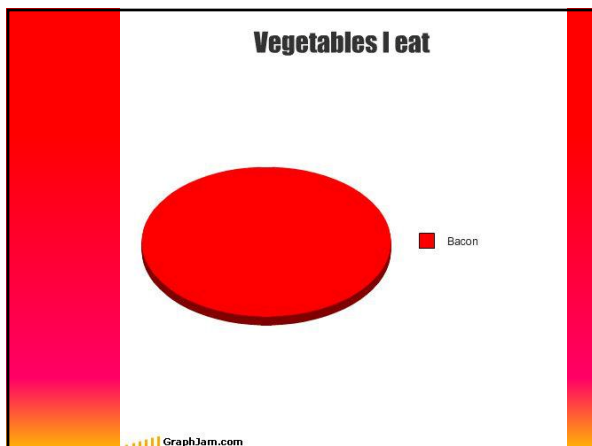


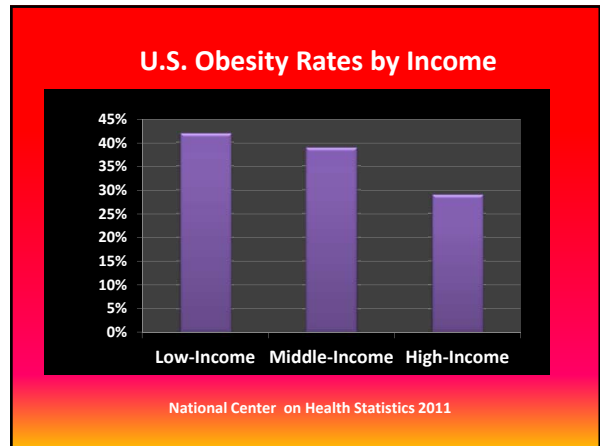
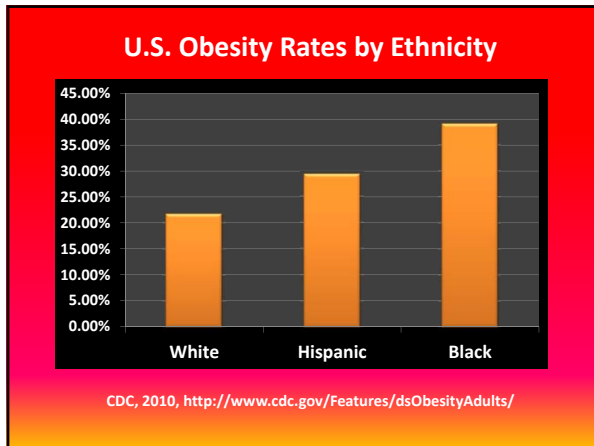
Taubes, 2011, *Why we get fat*: Knopf

- What are some of the findings that challenge this belief?
 - You can be on a near-starvation diet and still be fat
 - 95% of weight-loss efforts fail
 - Type of calories, not simply total calories, make a difference



- What makes us fat?



- Higher rates in ethnic groups because of differences in:
 - Behaviors that contribute to weight gain;
 - Individual attitudes and cultural norms related to body weight;
 - Access to affordable, healthful foods and safe locations to be physically active

CDC, 2010, <http://www.cdc.gov/Features/dsObesityAdults/>

- What about fat and disease?

- Earlier report claimed 400,000 deaths per year due to obesity
- Based on NHANES data in 2000, number 111,909 deaths due to obesity
- Impact of obesity on mortality has decreased over time perhaps due to improved health care

Flegal et al., *JAMA* 2005, 293(15): 1861-1867

- Underweight and obesity (>35) were associated with the highest mortality
- Overweight was not related to increased mortality

Flegal et al., *JAMA* 2005, 293(15): 1861-1867

- Only severe obesity was a significant mortality risk
- Overweight, in some cases, can actually be protective

Health Check
Fit As A Fiddle!
Very Good
Good
Normal
Bad

Flegal et al. *JAMA* 2005, 293(15): 1861-1867

What symptoms really count?

- Metabolic syndrome
 - Insulin resistance
 - High LDL and VLDL cholesterol
 - High triglycerides
 - Visceral obesity

Haffner & Taegtmeier, *Circulation* 2003; 108: 1541-1545

- Food problems
 - Insulin
 - Satiety mechanisms

- Foods that are bad for us are widely available, cheap, tasty, and served in large quantities

£3.99 LUNCH BOX
TAKE OUT (OR EAT IN)
FRESH * HOMEMADE * HUGE!

Not only a problem in the U.S.

- Overriding Satiety Mechanisms

- Bottle feeding
- Baby food


- These foods drive up insulin levels and override our satiety mechanisms

ATE 4 BOXES OF THIN MINTS



NOT FEELING THIN AT ALL

- Insulin is the principle regulator of fat metabolism



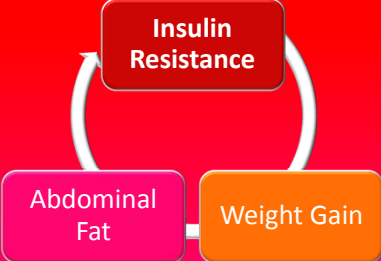
Taubes, 2011, *Why we get fat*: Knopf




- Types of fat
 - Fatty acids we burn for fuel
 - Triglycerides we store as fat
- Insulin promotes flow of fatty acids into fat cells so they can be bundled into triglycerides

Taubes, 2011, *Why we get fat*: Knopf

- Insulin resistance precedes weight gain



Bacon 2008, *Health at every size*.



- Insulin increases inflammation
- Inflammation enhances insulin resistance

King, *J Periodontol* 2008; 79(8): 1527-1534
 Taubes, 2011, *Why we get fat*: Knopf

- 133 older adults, 57 with metabolic syndrome
- Patients with metabolic syndrome had
 - More inflammation (ESR & CRP)
 - More depression
 - Worse cognitive function
- Metabolic syndrome and inflammation independently associated with depression



Viscogliosi et al., *Int J Geriatr Psychiatry* 2012, May 28. doi: 10.1002/gps.3817



- Sleep disorders, such as primary insomnia and obstructive sleep apnea, increase inflammatory markers, such as CRP, IL-6 and TNF- α

Suarez & Goforth. 2010 In *Psychoneuroimmunology of Chronic Disease*: American Psychological Association



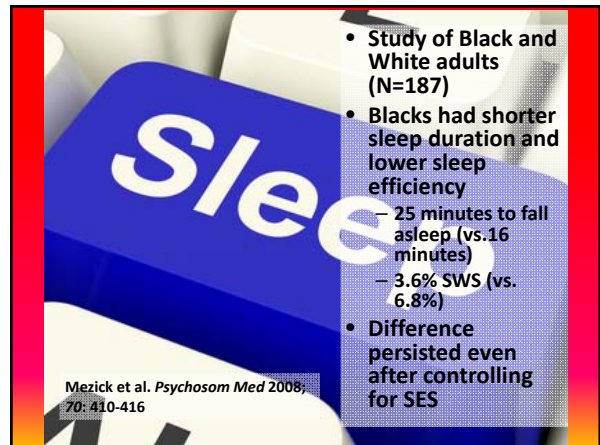
- Subclinical sleep disorders also increase risk for CVD, hypertension, Type-2 diabetes, metabolic syndrome and all-cause mortality

Suarez & Goforth. 2010 In *Psychoneuroimmunology of Chronic Disease*: American Psychological Association



- Population study from Sweden (N=10,756)
- Snoring and witnessed sleep apneas increased risk of diabetes in women, not men
- Women who snored, 58% increase in diabetes
- Witnessed sleep apnea increased diabetes risk three times
 - Adjusted for age, BMI, and waist circumference

Valham et al., *Sleep Med* 2009; 10: 112-117



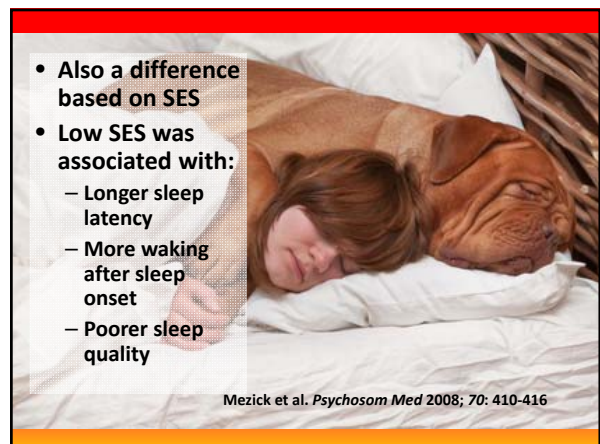
- Study of Black and White adults (N=187)
- Blacks had shorter sleep duration and lower sleep efficiency
 - 25 minutes to fall asleep (vs. 16 minutes)
 - 3.6% SWS (vs. 6.8%)
- Difference persisted even after controlling for SES

Mezick et al. *Psychosom Med* 2008; 70: 410-416



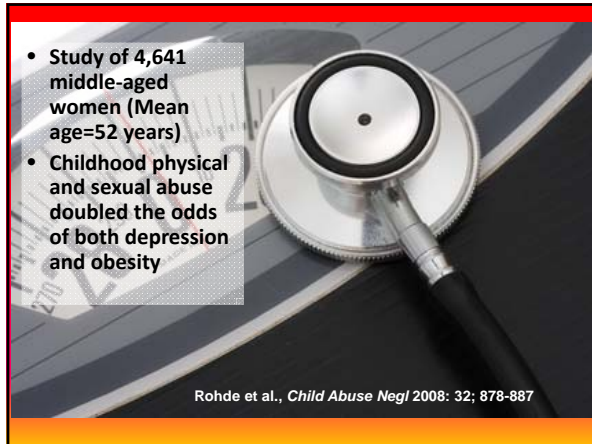
- Study of 97 Black and White adults
- Perceived unfair treatment (or both groups) was associated with
 - Poorer sleep quality
 - More daytime fatigue
 - Shorter sleep duration
 - Small proportion of REM
- Blacks had lower sleep time and poorer sleep efficiency

Beatty et al. *Health Psychol* 2011; 30(3): 351-359



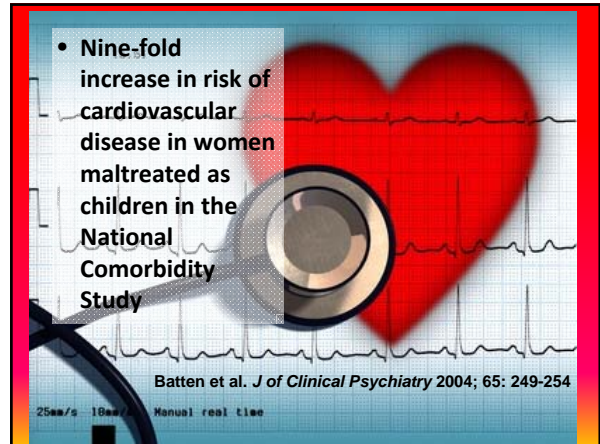
- Also a difference based on SES
- Low SES was associated with:
 - Longer sleep latency
 - More waking after sleep onset
 - Poorer sleep quality

Mezick et al. *Psychosom Med* 2008; 70: 410-416



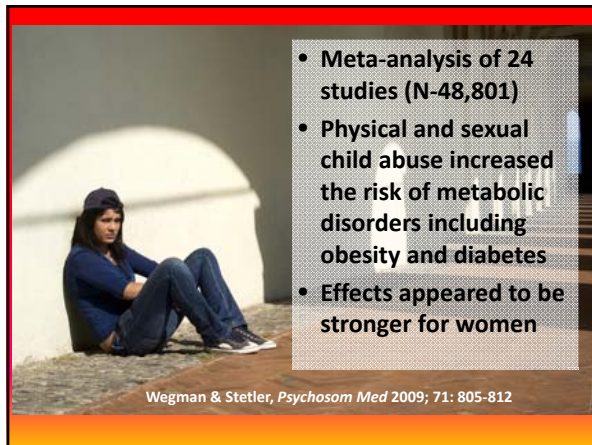
- Study of 4,641 middle-aged women (Mean age=52 years)
- Childhood physical and sexual abuse doubled the odds of both depression and obesity

Rohde et al., *Child Abuse Negl* 2008; 32: 878-887



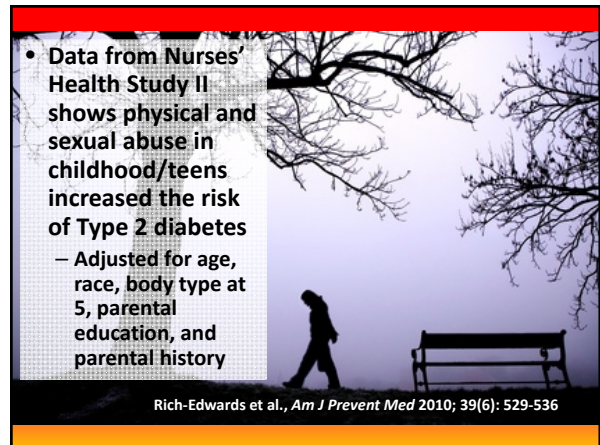
- Nine-fold increase in risk of cardiovascular disease in women maltreated as children in the National Comorbidity Study

Batten et al. *J of Clinical Psychiatry* 2004; 65: 249-254



- Meta-analysis of 24 studies (N=48,801)
- Physical and sexual abuse increased the risk of metabolic disorders including obesity and diabetes
- Effects appeared to be stronger for women

Wegman & Stetler, *Psychosom Med* 2009; 71: 805-812



- Data from Nurses' Health Study II shows physical and sexual abuse in childhood/teens increased the risk of Type 2 diabetes
 - Adjusted for age, race, body type at 5, parental education, and parental history

Rich-Edwards et al., *Am J Prevent Med* 2010; 39(6): 529-536



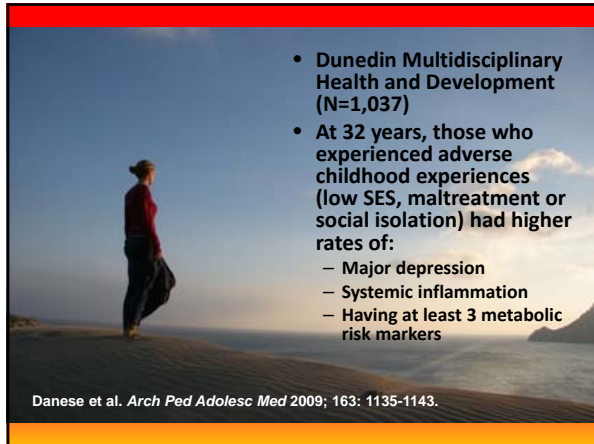
- Severity of abuse increased symptoms
- 50% increase in risk for severe physical abuse
- 69% increase in risk for repeated forced sex

Rich-Edwards et al., *Am J Prevent Med* 2010; 39(6): 529-536



- BMI also influenced by past abuse
 - Physically and sexually abuse girls had higher BMIs
 - Trajectories grew wider as the girls grew
 - Particularly for those who experienced repeated forced sex

Rich-Edwards et al., *Am J Prevent Med* 2010; 39(6): 529-536



- Dunedin Multidisciplinary Health and Development (N=1,037)
- At 32 years, those who experienced adverse childhood experiences (low SES, maltreatment or social isolation) had higher rates of:
 - Major depression
 - Systemic inflammation
 - Having at least 3 metabolic risk markers

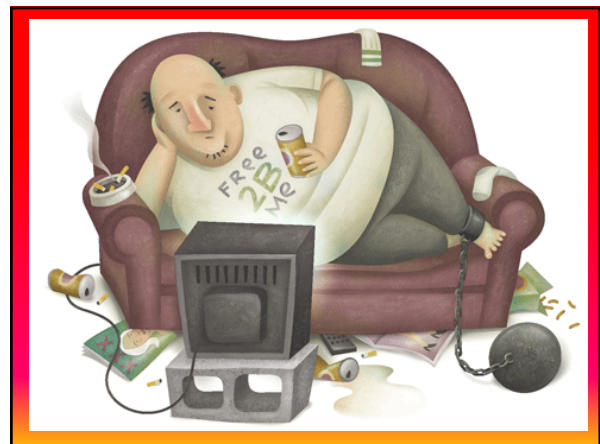
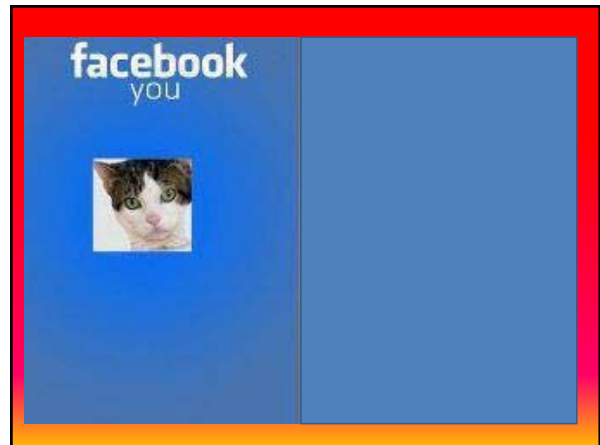
Danese et al. *Arch Ped Adolesc Med* 2009; 163: 1135-1143.



- Study of 177 Blacks and 822 whites, ages 35-86
- Composite of early life adversities and 5 measures of inflammation
- Early-life adversity predicted higher levels of inflammation for blacks, but not whites

Slopen et al., *Psychosom Med* 2010; 72: 694-701

• Fat Hatred





- Health practitioners are among the most insidious players in this fat-hating drama as they have legitimized the cultural mandate for thinness by reframing it as a health concern

Bacon 2008, *Health at Every Size*. BenBella Books.



- The neuroscience of social rejection

- Throughout our evolutionary history, being socially connected increased our chances of survival
- Being part of the a group provided resources, protection, and safety

Panksepp, 2011. *Social pain* (11-51). Amer Psycholog Assn



- The pain of social rejection is thought to be adaptive in that it makes us want to avoid it and therefore be part of a group

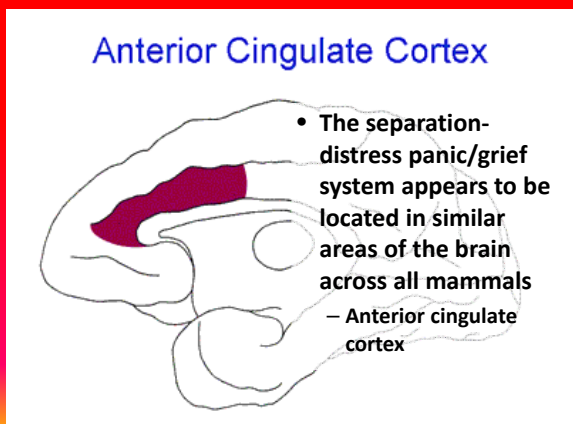
Panksepp, 2011. *Social pain* (11-51). Amer Psycholog Assn.



- Social pain is processed in the same part of our brains, and is experienced in the same way, as physical pain
- Recent studies have found that we physically experience threats to our relationships as threats to our survival

Jenson-Campbell & MacDonald, 2011 *Social pain* (3-8). Amer Psycholog Assn.

Anterior Cingulate Cortex



- The separation-distress panic/grief system appears to be located in similar areas of the brain across all mammals
 - Anterior cingulate cortex



- Rejection or negative social evaluation is associated with increases in stress hormones, increased cardiovascular response, and greater proinflammatory cytokines
- Emotional pain, grief, and loneliness share the same neural pathways as physical pain

Dickerson, 2011. *Social pain* (79-94). Amer Psycholog Assn.



- Social pain or losses during childhood can predispose people to chronically elevated psychic pain for the rest of their lives

Eisenberger, 2011 *Social pain* (53-78); Panksepp, 2011 *Social pain* (11-51), Amer Psycholog Assn.




- 296 African Americans (M age=73), self-reported experiences of discrimination were associated with elevated C-reactive protein levels
 - This association remained even after controlling for depression, smoking, chronic health conditions, such as heart disease, diabetes, and hypertension

Lewis et al: *Brain Behav Immun* 2010; 24(3): 438-443

- **Perceived discrimination African Americans**
 - You are treated with less courtesy other people
 - You are treated with less respect than other people
 - You receive poorer service than other people at restaurants and stores
 - People act as if they think you are not smart

Lewis et al. *Brain Behav Immun* 2010; 24(3): 438-443




- The key emotional component of a response to threats against the "social self"
- It leaves people feeling exposed, vulnerable, and "defective"

SHAME

Persons et al., *AIDS Patient Care & STDs* 2010; 24(9), 571-580




- Prolonged social threat increases the risk of adverse health outcomes
- Shame results when a person concludes that they have lost social value and are at risk for rejection by the community



Dickerson et al., *Psychosom Med* 2004; 66: 124-131

- Larger people experience more cynical mistrust, which increases inflammation
- Obesity is associated with low-grade inflammation, with elevated levels of C-reactive protein, IL-6, TNF- α

Ranjit et al., *Arch Internal Med* 2007; 167(2): 174-181; Schmatz et al., *J Perinatology* 2010; 30: 441-446



The Pima Indians of the Gila River

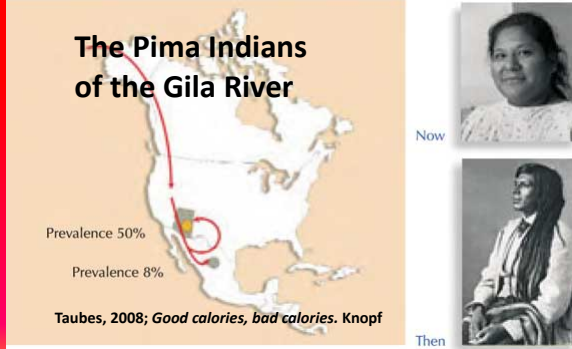
Prevalence 50%

Prevalence 8%

Taubes, 2008; *Good calories, bad calories*. Knopf

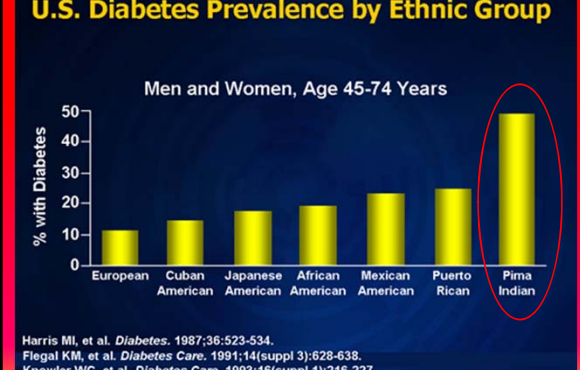
Now

Then



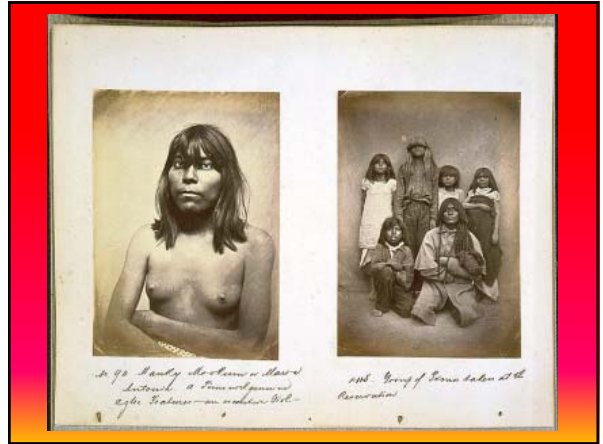
U.S. Diabetes Prevalence by Ethnic Group

Men and Women, Age 45-74 Years



Ethnic Group	% with Diabetes
European American	~10%
Cuban American	~15%
Japanese American	~18%
African American	~19%
Mexican American	~22%
Puerto Rican	~24%
Pima Indian	50%

Harris MI, et al. *Diabetes*. 1987;36:523-534.
 Flegal KM, et al. *Diabetes Care*. 1991;14(suppl 3):628-638.
 Knowler WC, et al. *Diabetes Care*. 1993;16(suppl 1):216-227.
 Fujimoto WY, et al. *Diabetes Res Clin Pract*. 1991;13:119-128.
 Fujimoto WY, et al. *Diabetes*. 1987;36:721-729.





- **Bottle-feeding, regardless of the type of milk, affects infants' self-regulation of milk**
- **Study of 1205 infants**
 - 27% of EBF infants emptied bottle or cup in late infancy
 - 54% of infants fed by bottle and breast
 - 68% of infants fed by bottle only




Li et al. *Pediatrics* 2010; 125; e1368-e1393.



- **Reset hypothesis**
- **During gestation**
 - Visceral fat accumulates
 - Insulin resistance increases
 - Lipid and triglyceride levels increase
- **Breastfeeding helps reverse, or reset, these changes**
- **For maternal metabolism, pregnancy ends with weaning, not birth**


Stuebe & Rich-Edwards, *Am J Perinatol* 2009; 26: 81-88



- **Study of 139,681 postmenopausal women (Mean age=63)**
- **Lifetime history of lactation of more than 12 months related to lower**
 - Hypertension
 - Diabetes
 - Hyperlipidemia
 - Cardiovascular disease

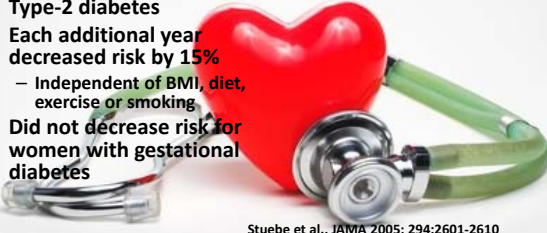
Schwartz et al., *Obstet Gyn* 2009; 113: 974-982

- **Cohort analysis of 2,516 parous, midlife women (SWAN study)**
- **Increased breastfeeding duration lowered prevalence of metabolic syndrome in a dose-response way**




Ram et al., *Am J Obstet Gynecol* 2008; 198:268e1-268e6

- 85,585 and 73,418 parous women (Nurses' Health Study I & II; Mean age=50)
- Longer duration of lactation reduced risk of Type-2 diabetes
- Each additional year decreased risk by 15%
 - Independent of BMI, diet, exercise or smoking
- Did not decrease risk for women with gestational diabetes




Stuebe et al., JAMA 2005; 294:2601-2610

- Data from Longitudinal Study of Australian Children (N=3075)
- Breastfeeding initiation
 - 95% for BMI 20-24
 - 93% for BMI 25-30
 - 87% for BMI >30
- Breastfeeding at 6 months
 - 64% for BMI 20-24
 - 54% for BMI 25-30
 - 44% for BMI >30



Donath & Amir, Mat Child Health Nutr 2008; 4: 163-170


- Birth cohort study of 1,803 mothers in Perth, Australia
- Prepregnancy BMI >25 reduced breastfeeding duration of breastfeeding at all time points up to 6 months
 - Independent of SES, demographic, and biomedical characteristics
 - In BMI >25, mothers more likely to have c-sections, pregnancy complications, preeclampsia, baby blues



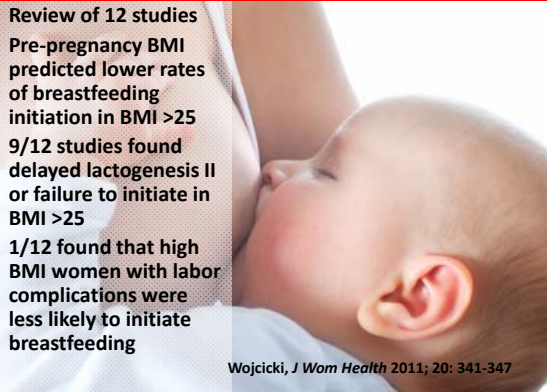
Oddy et al., J Pediatrics 2006; 149: 185-191

- Prepregnancy BMI >30 related to decreased breastfeeding initiation and duration in Hispanic women
- More likely to formula feed and breast-milk feed
- This was not true for BMI >30 African American women
 - 587 Hispanic women, 640 African American women

Kugyelka et al., J Nutri 2004; 134: 1746-1753



- Review of 12 studies
- Pre-pregnancy BMI predicted lower rates of breastfeeding initiation in BMI >25
- 9/12 studies found delayed lactogenesis II or failure to initiate in BMI >25
- 1/12 found that high BMI women with labor complications were less likely to initiate breastfeeding




Wojcicki, J Wom Health 2011; 20: 341-347

- Prospective study of 688 mothers, pregnancy to 3 months postpartum
- Found significantly lower rates of breastfeeding initiation in women BMIs >26
- Depression, anxiety, stress, and self-esteem did not mediate the relationship between BMI and initiation rates



Mehta et al., 2011 Breastfeeding Med; 6(6): 369-376

- Study of 431 mothers
- LG-II significantly delayed in mothers BMI >25
- Also delayed after c-section and labor >14 hrs
- Multivariate model: maternal BMI; age >30; birthweight >3600; absence of nipple discomfort 0-3 day pp; infant not feeding well >2 times/first 24 hours
- Postpartum edema significant alternate model



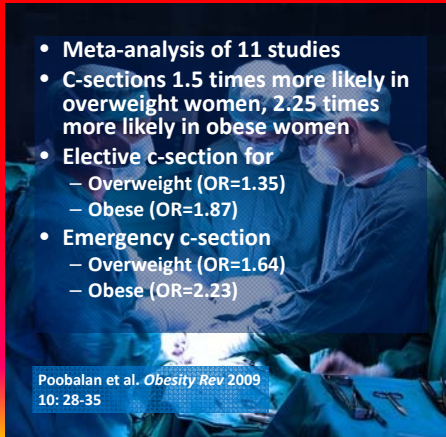
Nommsen-Rivers et al. *Am J Clin Nutri* 2010; 92: 574-584

- Study of 40 women (23 BMI < 26; 17 BMI >26)
- Hypothesized that high BMI women would have a lower prolactin response to suckling at 2 and 7 days
 - Due to higher progesterone concentrations in fat
- Significant difference at Day 2, but not at Day 7
- No significant difference in progesterone levels at either point



Rasmussen & Kjolhede, *Pediatrics* 2004; 113: e465-e471

- Meta-analysis of 11 studies
- C-sections 1.5 times more likely in overweight women, 2.25 times more likely in obese women
- Elective c-section for
 - Overweight (OR=1.35)
 - Obese (OR=1.87)
- Emergency c-section
 - Overweight (OR=1.64)
 - Obese (OR=2.23)



Poobalan et al. *Obesity Rev* 2009 10: 28-35

- Women with BMIs >50 significantly more likely to have c-sections
 - 49% c-section rate;
 - 34% scheduled c-sections



Marshall et al. *Acta Obstet Gyn Scand* 2010; 89: 924-930



How shall we then treat?

- We need more research on why BMI>30 women have lower breastfeeding initiation rates
- Need to include measures of trauma, perception of birth, body image



- Targeted interventions for higher-BMI women have not improved rates
 - Possibly creating self-fulfilling prophecies and/or shaming high-BMI women



Anstey & Jevitt, *Clin Lact* 2011; 2(3), 11-16

HUMAN RIGHTS



PLEASE STOP WEIGHT BULLIES...
HEALTH IS FOR EVERY BODY.

SUPPORTALLKIDS.COM

SPONSORED BY  MORE OF ME TO LOVE.COM



FAT!SO?



BEING A HEALTHY WOMAN

isn't about getting on a scale or measuring your waistline. We need to start focusing on what matters—on how we feel, and how we feel about ourselves.

MICHELLE OBAMA

