



NORTHWEST AIDS EDUCATION AND TRAINING CENTER

# Anthropometrics in HIV Infection

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# Objectives...or what we're gonna learn today

- Population norms for body shape
- Outcomes of abnormal body size
- Treatment options for abnormal body size

A few definitions...

- Anthropometrics:
  - Measures using tape measures, weight, height, or calipers
- Can measure body composition in more detail though
  - DXA, CT, MRI, BIA

# Case Study and Data

# Case: Mr. K

- Infected 1 month prior
- Mid 40's, white male
- Recently off meth
- Physical Activity:
  - Nada, nunca, nothing
- Diet:
  - Cereal...once per day
- Wants weight gain, no 'HIV look'



# Mr. K

## How does he compare to other PLWHA?

April 2010

- Waist: 81.9 cm (32.25 in)
- Arm: 27.6 cm (10.875 in)
- Calf: 34 cm (13.375 in)
- BMI: 21.8

For age and sex:

90.0 cm

31.5 cm

25.0

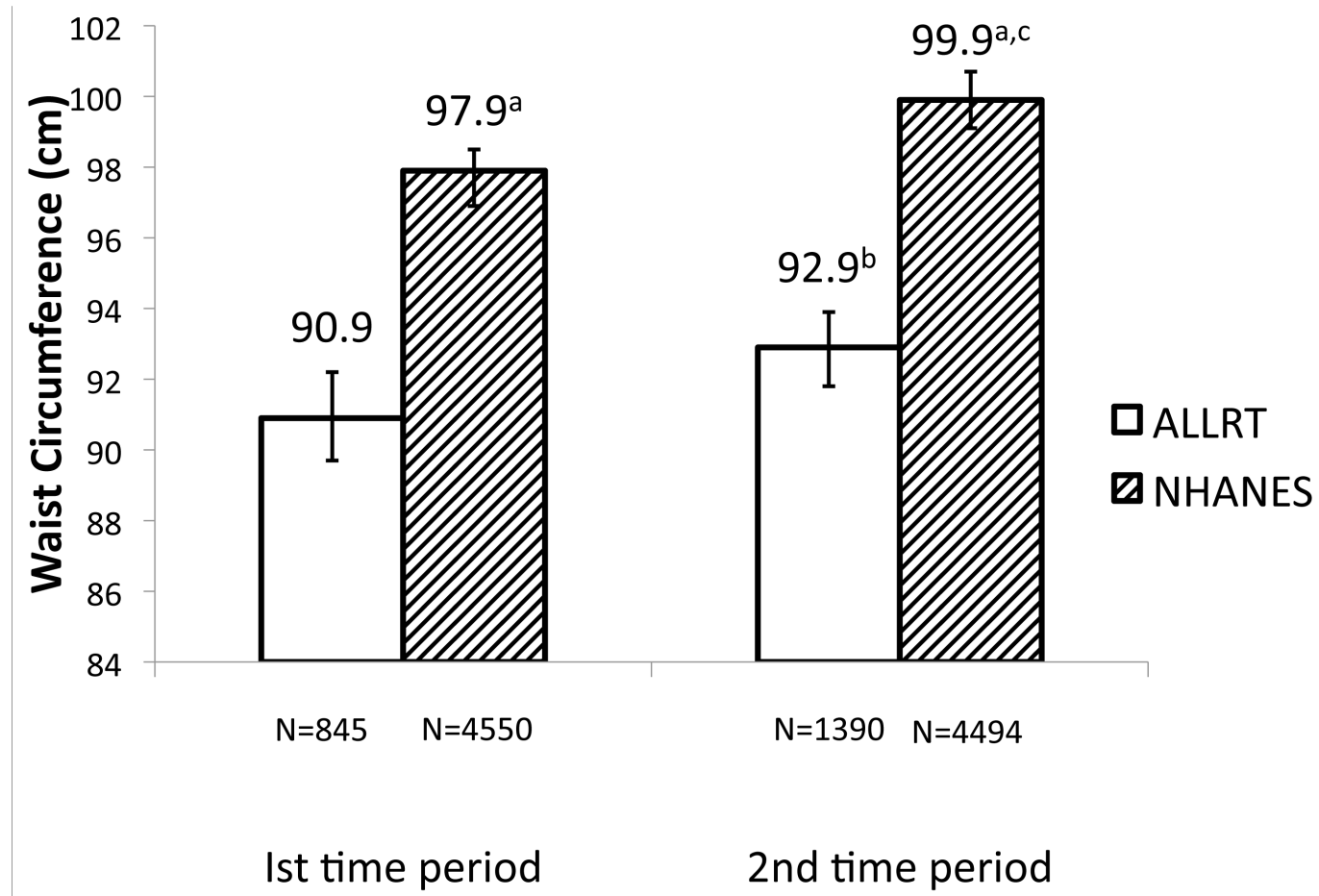
# Waist Circumference

	1998–2002			2003–2007				
	N	Percentile		N	Percentile			
Age, years		25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>		25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>
<i>Male</i>								
20–29	144	78.0	83.5	88.7	269	77.0	83.0	91.5
30–39	374	80.5	87.0	94.0	504	82.0	87.5	96.0
40–49	248	82.5	88.5	95.0	422	84.0	90.0	97.0
50–59	66	82.0	90.0	96.5	149	85.0	91.5	101.5
<i>Female</i>								
20–29	30	78.0	86.0	98.0	42	75.5	83.5	90.0
30–39	77	78.0	90.0	102.0	102	81.0	89.8	104.0
40–49	61	77.5	84.5	94.5	104	82.2	89.5	99.0
50–59	20	82.7	89.0	94.5	38	83.0	90.8	100.5

<sup>a</sup>ALLRT participants <20 and >59 years were excluded due to limited sample size.  
doi:10.1371/journal.pone.0065306.t003



# How do other PLWHA compare to HIV-uninfected?



# Mr K: Changes after 20 months

April 2010

- Waist: 81.9 cm (32 inches)
- Arm: 27.6 cm (11 inches)
- Calf: 34 cm (13 inches)
- BMI: 21.8

Dec 2011

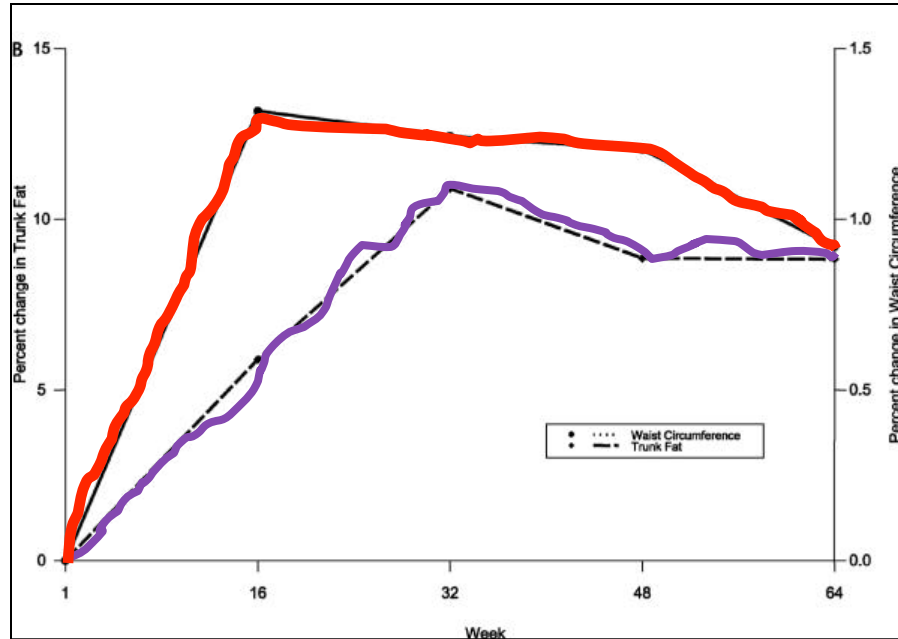
89.0 cm  
30.5 cm  
35.6 cm  
24.7

FIGURE 1

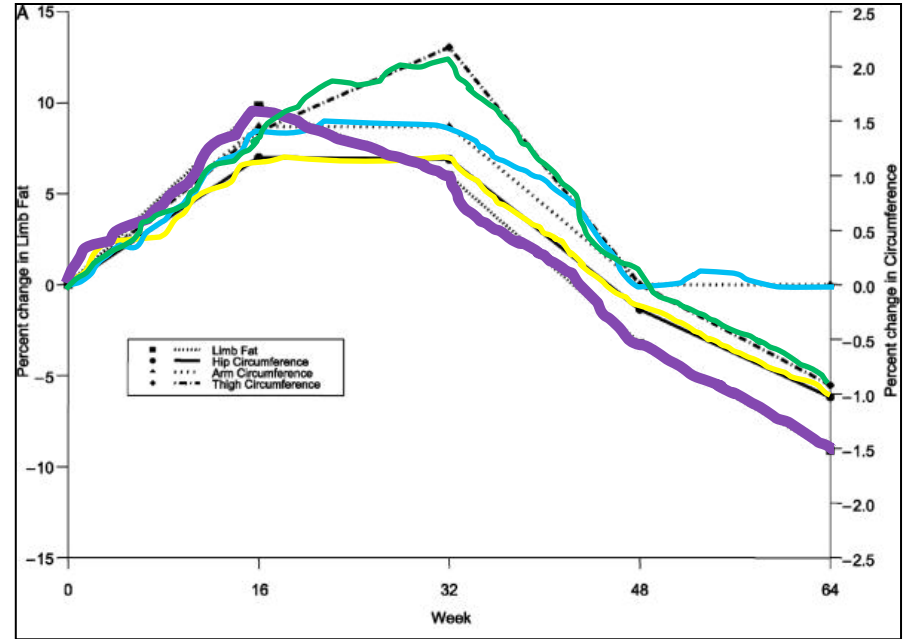
# DXA and Circumferences are Equivalent

After 64 weeks of randomized dual NRTI plus NNRTI (ACTG 384)

## Waist Circ.

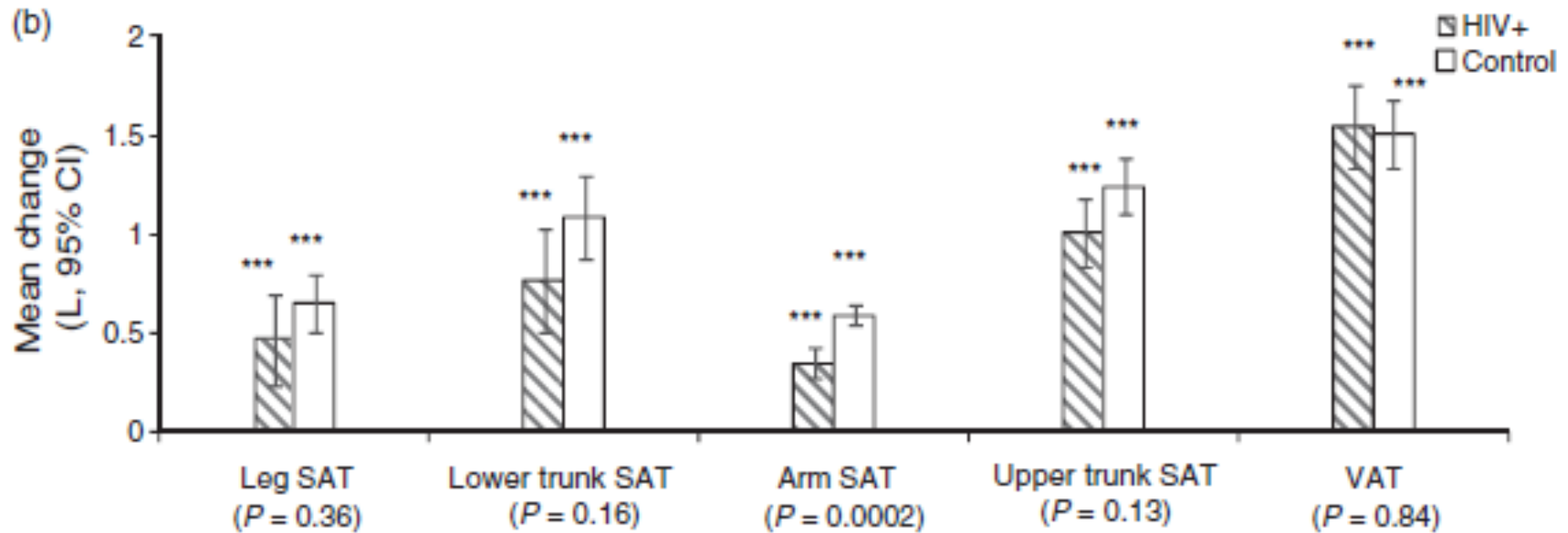


## Arm, Hip, Thigh Circ.



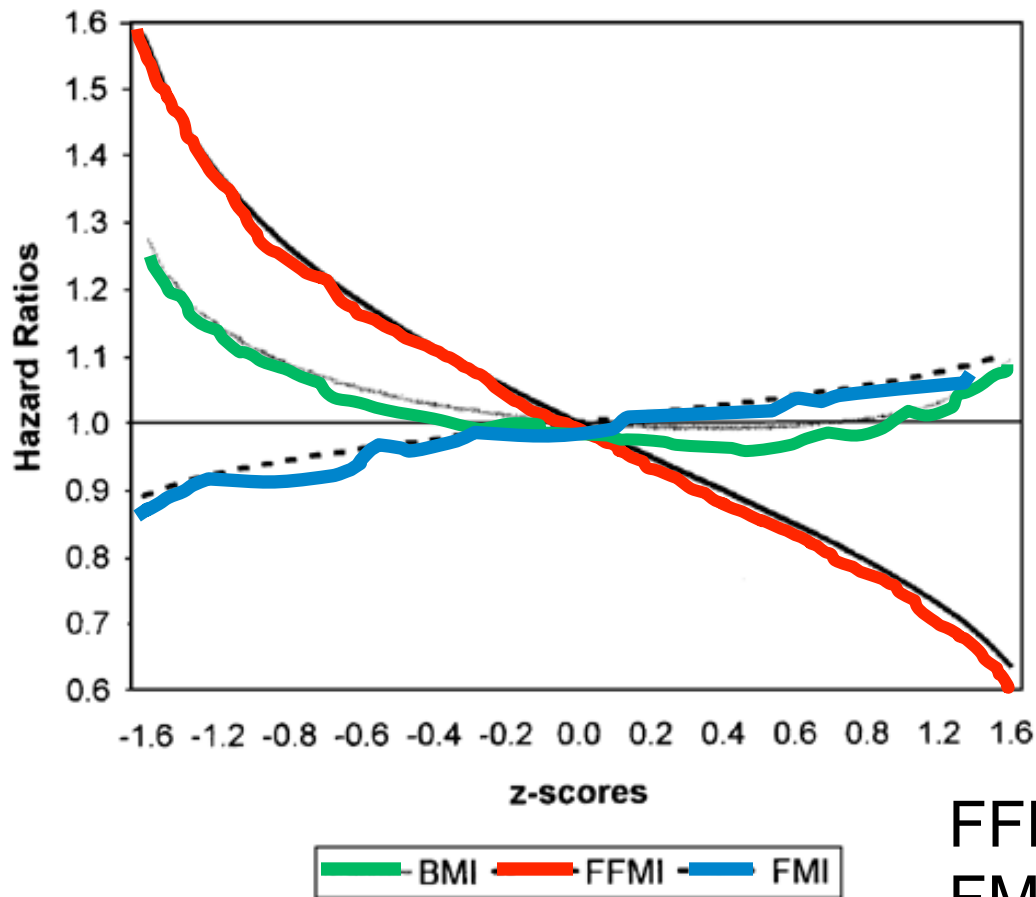
Colored Lines = Circumferences      Purple = DXA

# Body Fat on HAART: 5-year f/u MRI in men



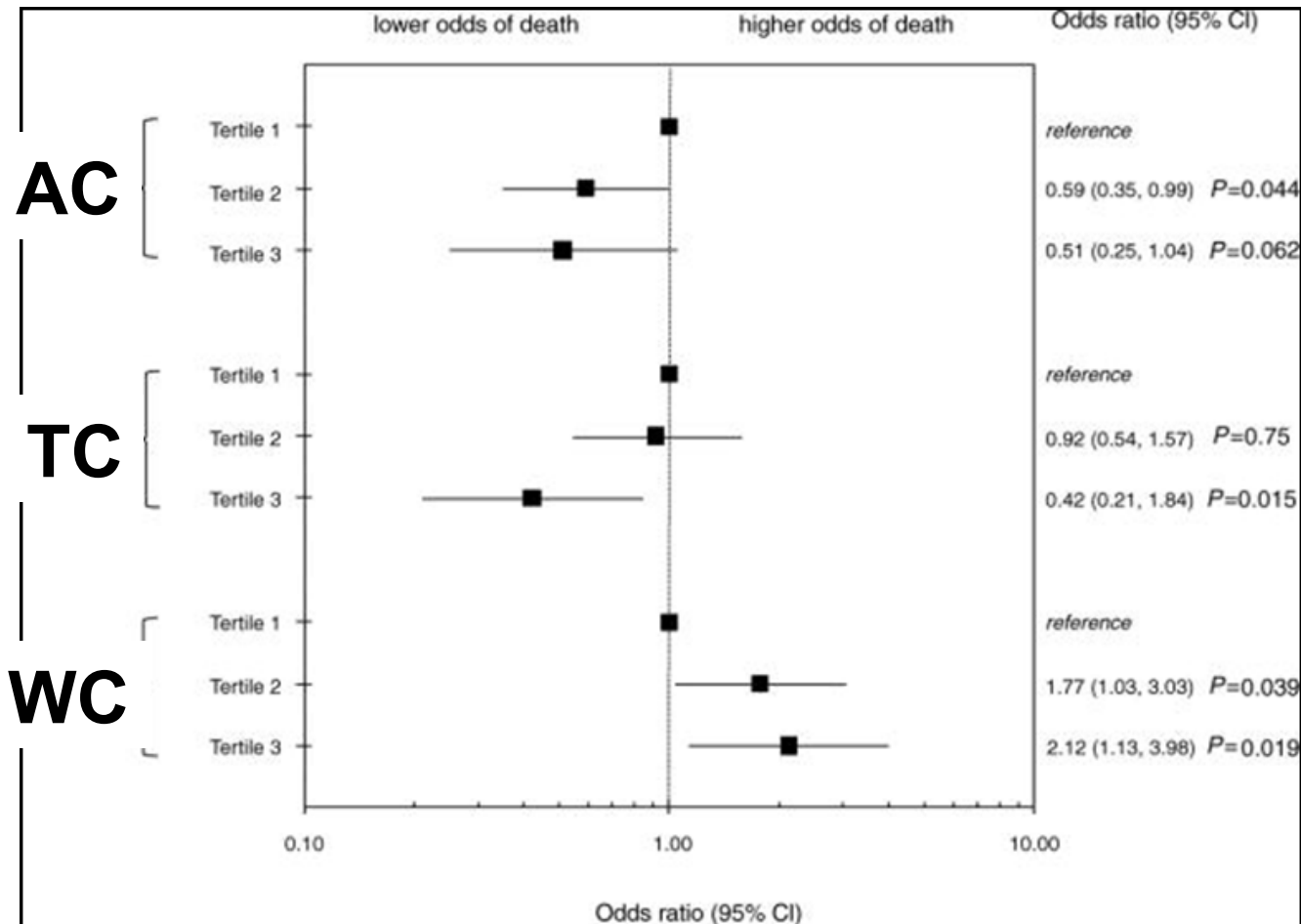
# General population: Outcomes from altered body shape

All-cause  
Mortality

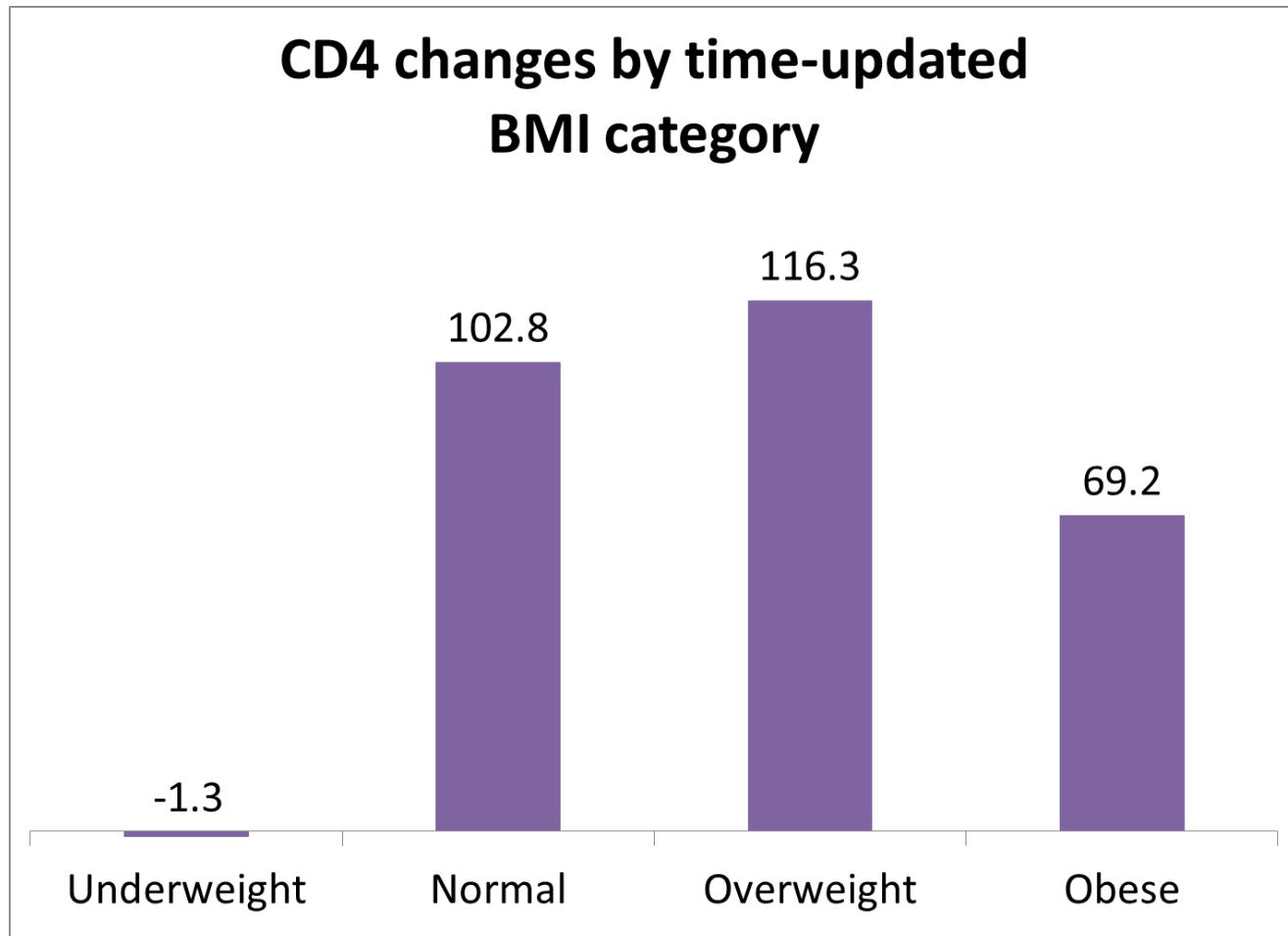


FFMI = Arm Circ.  
FMI = Skinfolts

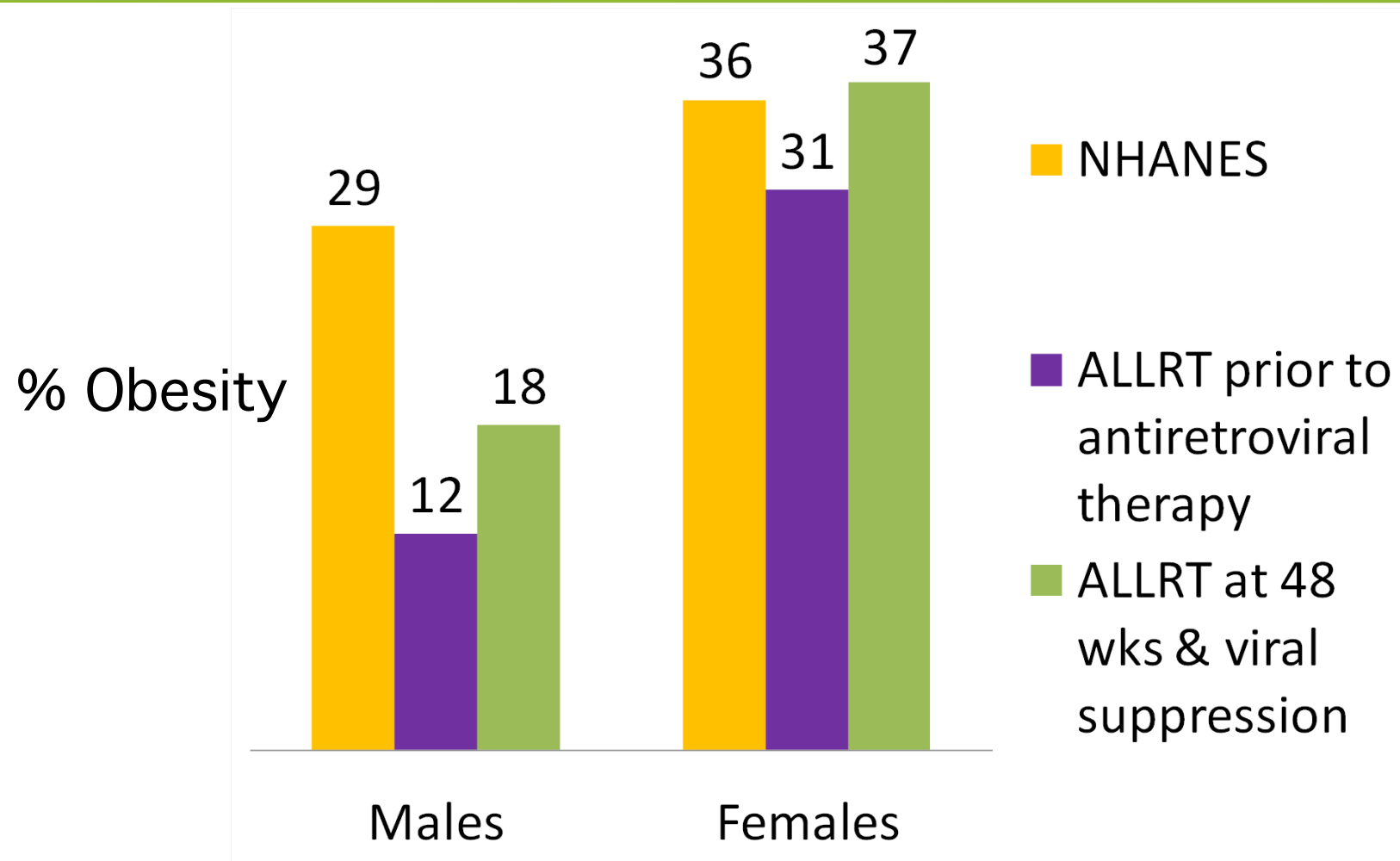
# HIV-infected: Outcomes from altered body shape— Mortality in FRAM after 5 years



# HIV-infected: Outcomes from altered body shape



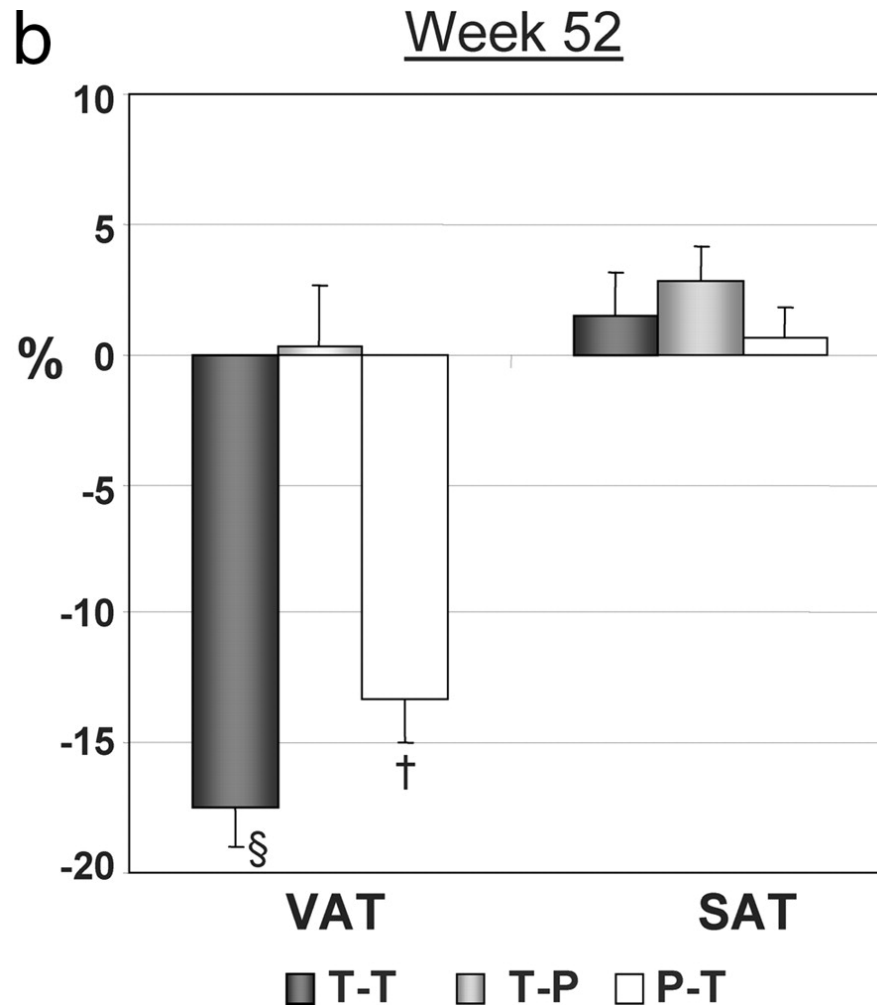
# Obesity Prevalence



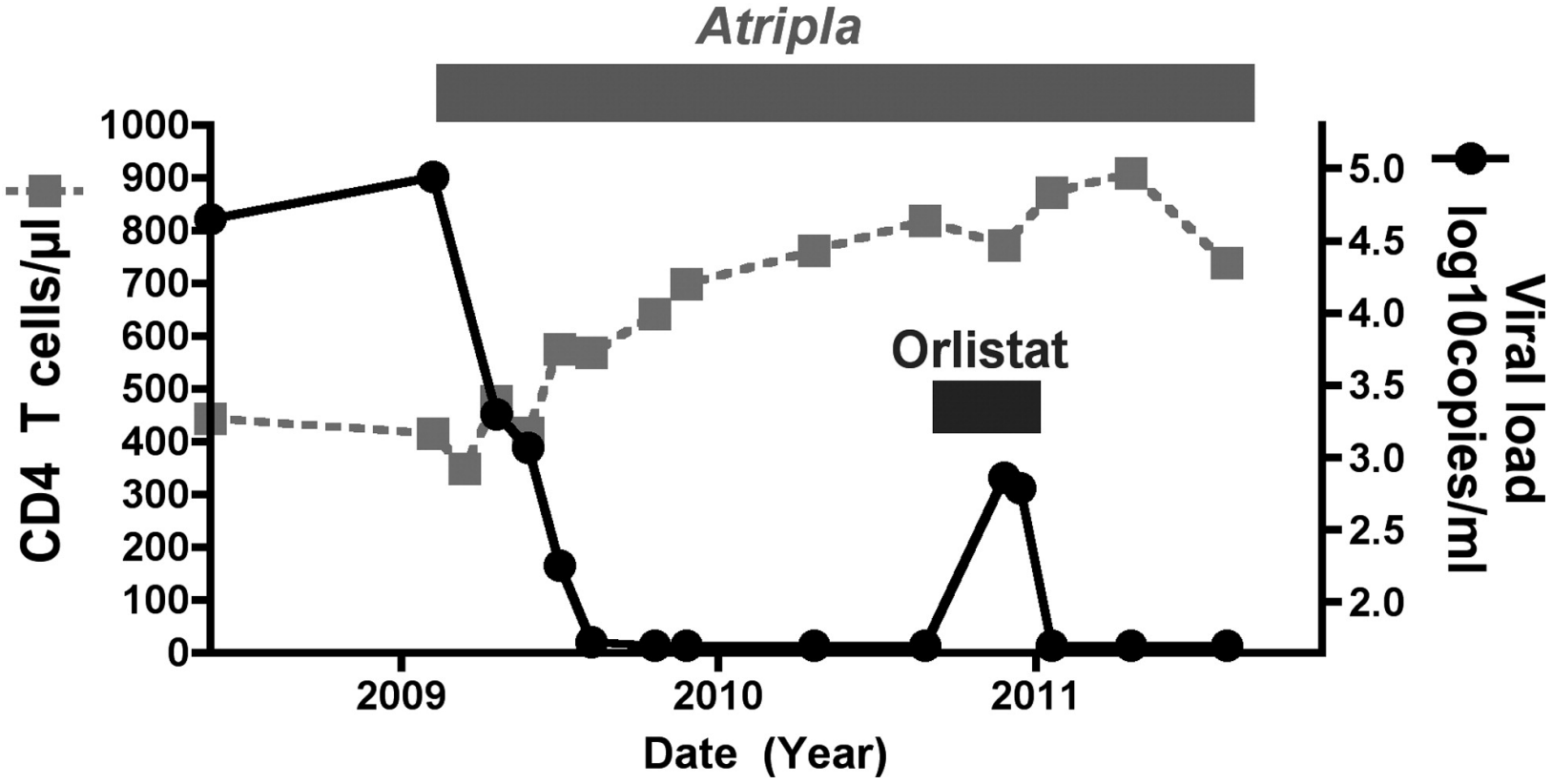


# What to do

# Tesamorelin: % Change after 52 weeks (crossover)

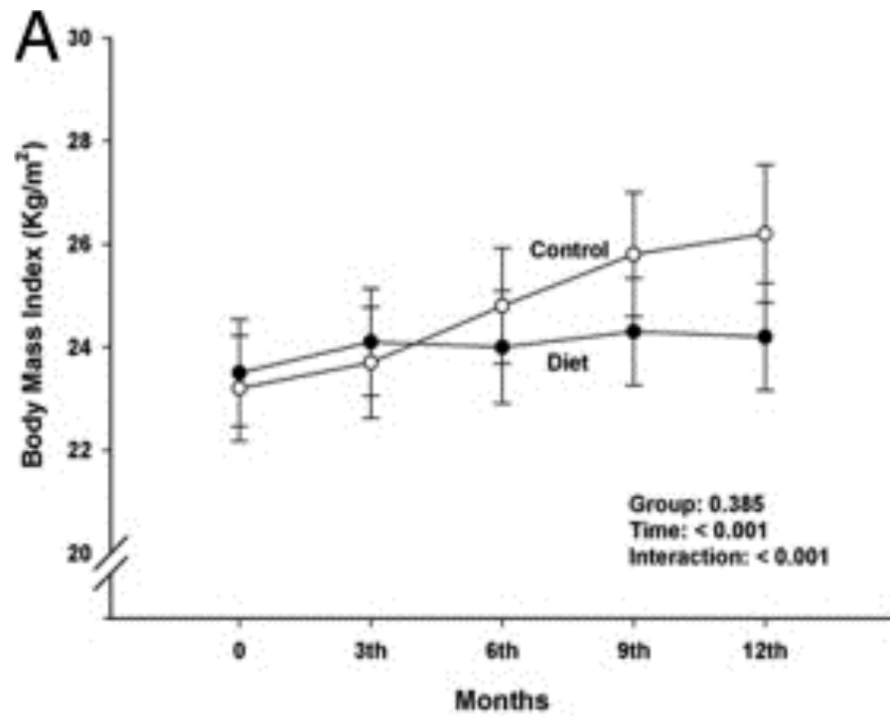


# Is Orlistat OK?



# Dietary Interventions for HIV & Obesity or Lipohypertrophy

- “Our study has some limitations, including the lack of data on changes in diet, alcohol intake, and physical activity...”



# Dietary Intervention Used by Lazzaretti 2012

**Table 6.** Nutrient Composition of the Therapeutic Lifestyle Changes (TLC) Diet

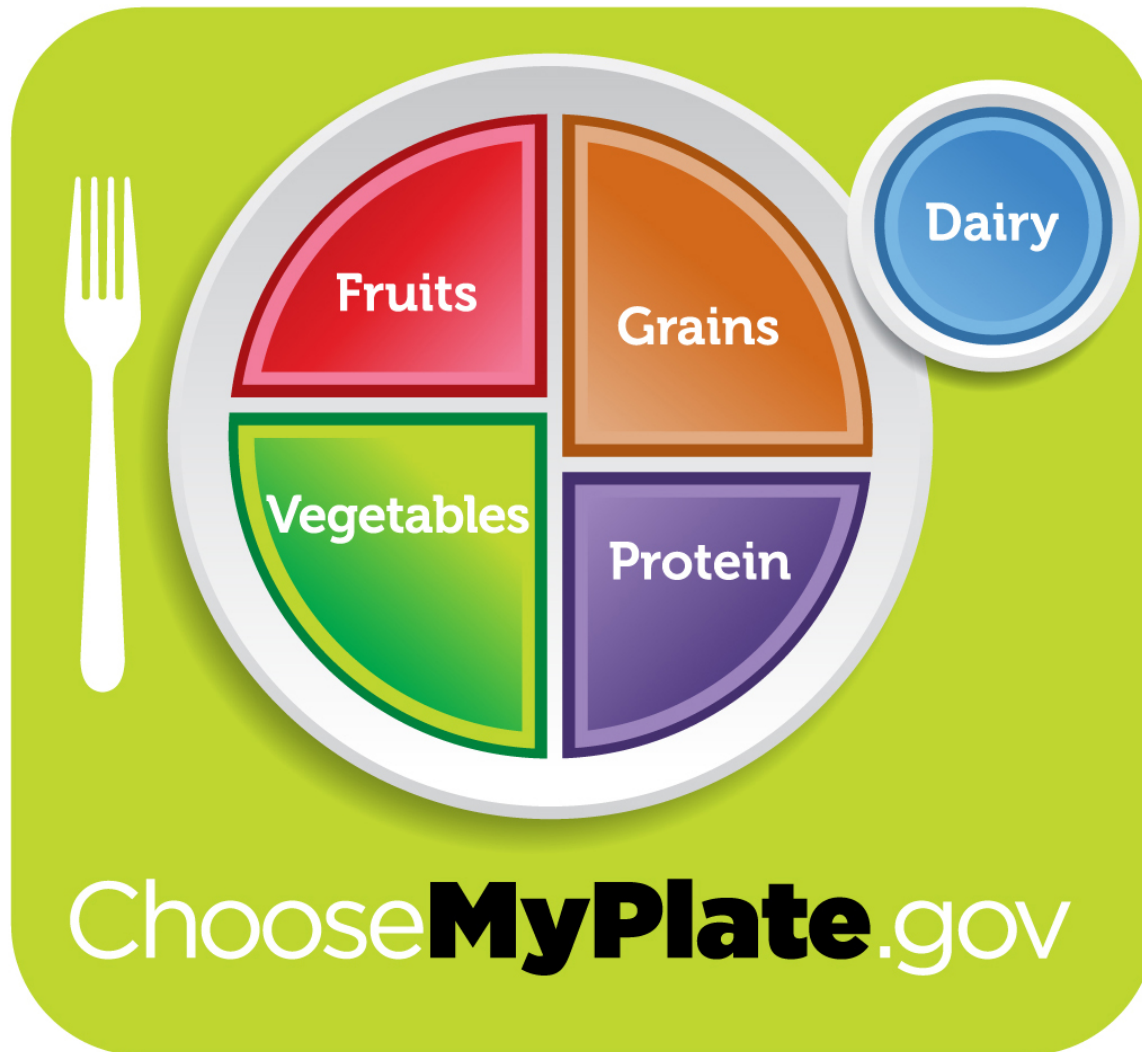
Nutrient	Recommended Intake
Saturated fat*	<7% of total calories
Polyunsaturated fat	Up to 10% of total calories
Monounsaturated fat	Up to 20% of total calories
Total fat	25%-35% of total calories
Carbohydrate†	50%-60% of total calories
Fiber	20-30 g/d
Protein	Approximately 15% of total calories
Cholesterol	<200 mg/d
Total calories‡	Balance energy intake and expenditure to maintain desirable body weight/prevent weight gain

\**Trans* fatty acids are another LDL-raising fat that should be kept at a low intake.

†Carbohydrates should be derived predominantly from foods rich in complex carbohydrates including grains, especially whole grains, fruits, and vegetables.

‡Daily energy expenditure should include at least moderate physical activity (contributing approximately 200 kcal/d).

Choosemyplate.gov



# Mr. K

## Final Thoughts

- April 2010
  - Waist: 81.9 cm
  - BMI: 21.8
  - Started eating high calorie diet
- Dec 2011
  - Waist: 89.0 cm
  - BMI: 24.7
  - Started eating lower calorie diet, based on Choosemyplate
- Current
  - Waist: 86.5 cm
  - BMI: 25.0



# Resources

- Choosemyplate.gov
- Idndpg.org
- Eatright.org
- CDC Diabetes Prevention Program
  - <http://www.cdc.gov/diabetes/prevention/pdf/handouts.pdf>
- batkinso@uw.edu