Double Trouble: Role of testosterone deficiency and obesity in prostate cancer

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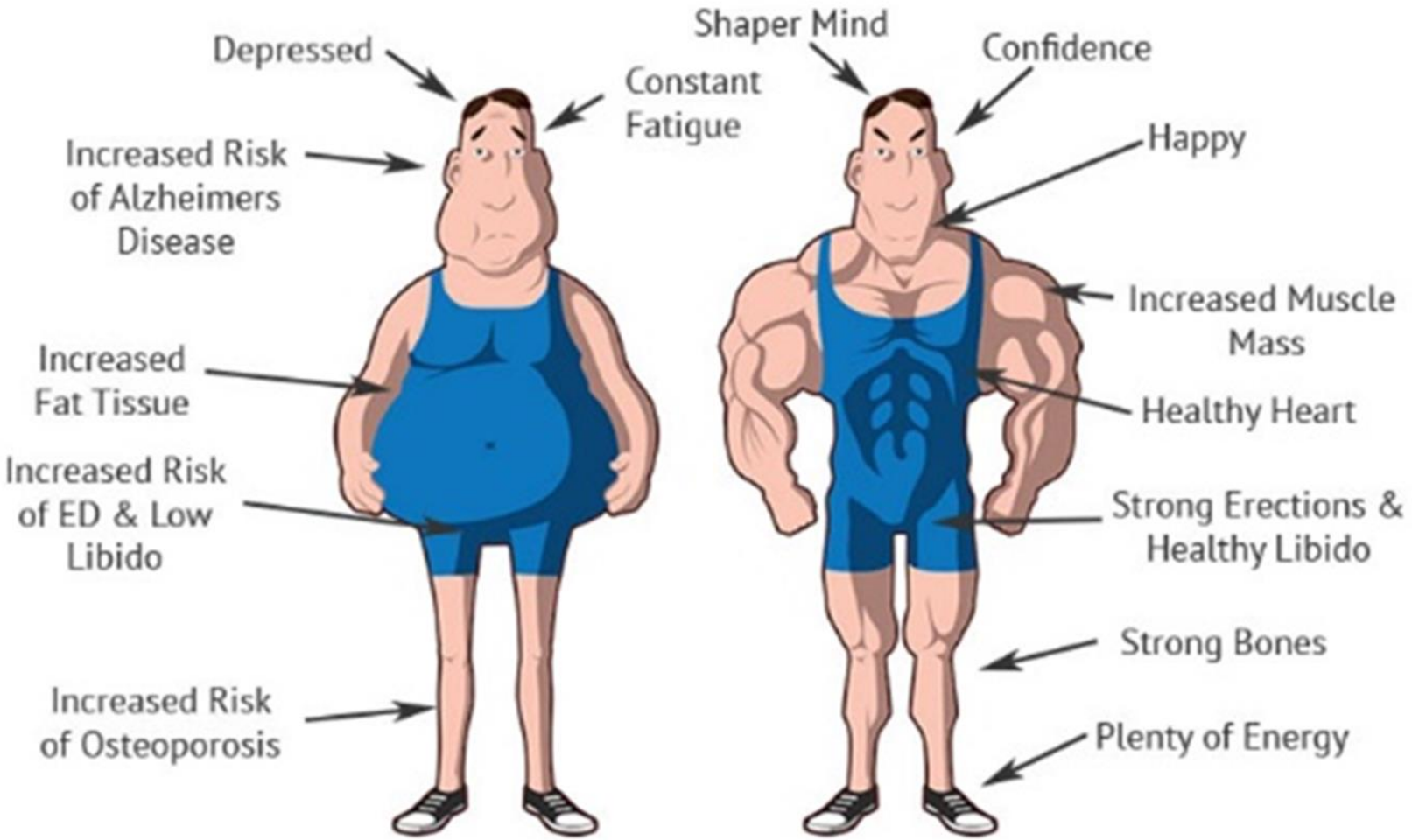
Benefits of Optimal Testosterone



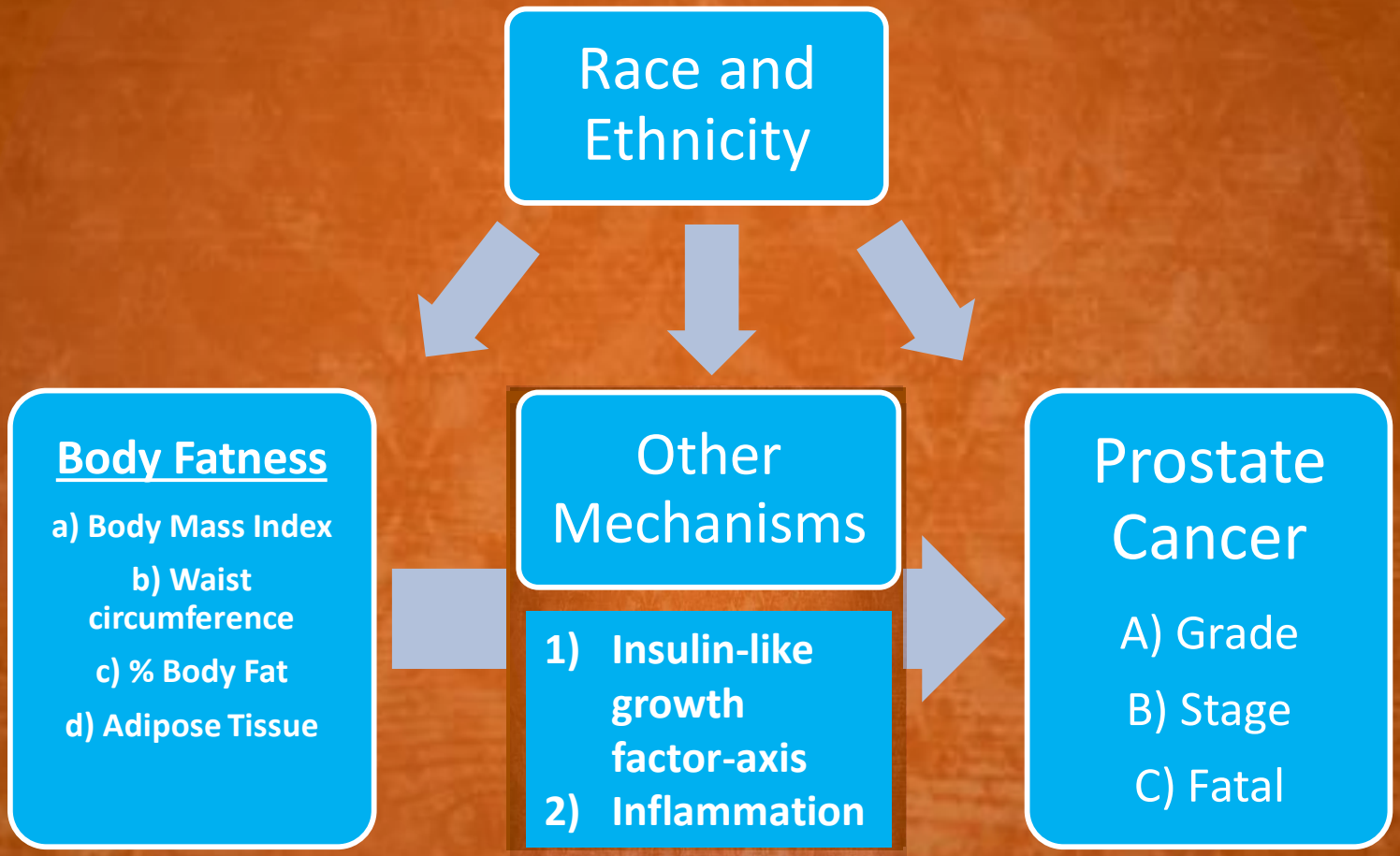

COLUMBINE A YEAR LATER:
CAN YOU SPOT A KILLER KID?
STOCKS: IS THIS
DIP DIFFERENT?
TESTOSTERONE
It restores sex drive.
It boosts muscle mass.
And soon you can get it
as a gel. But it also
can be dangerous.
Is the edge worth it?

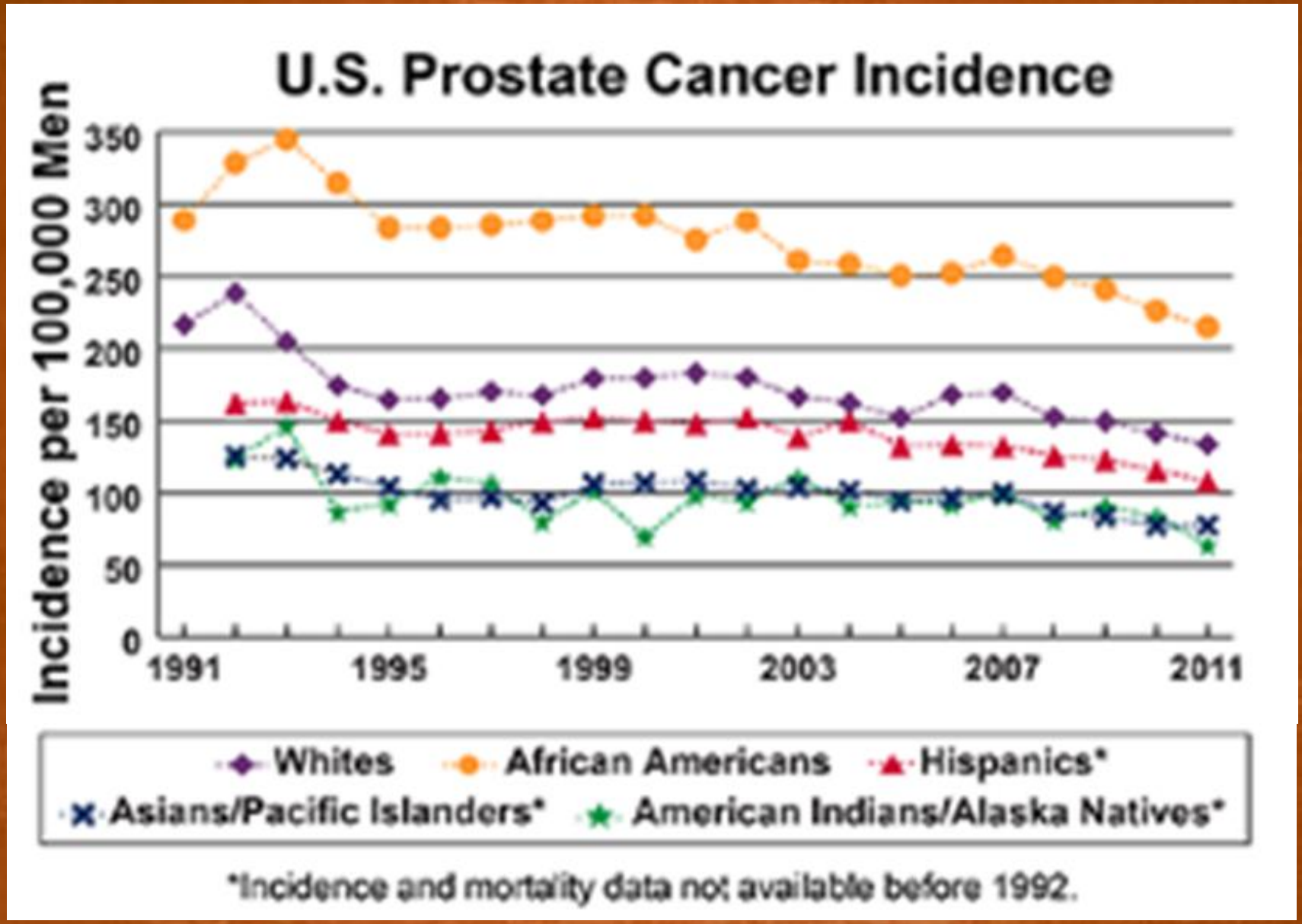

Low T Center

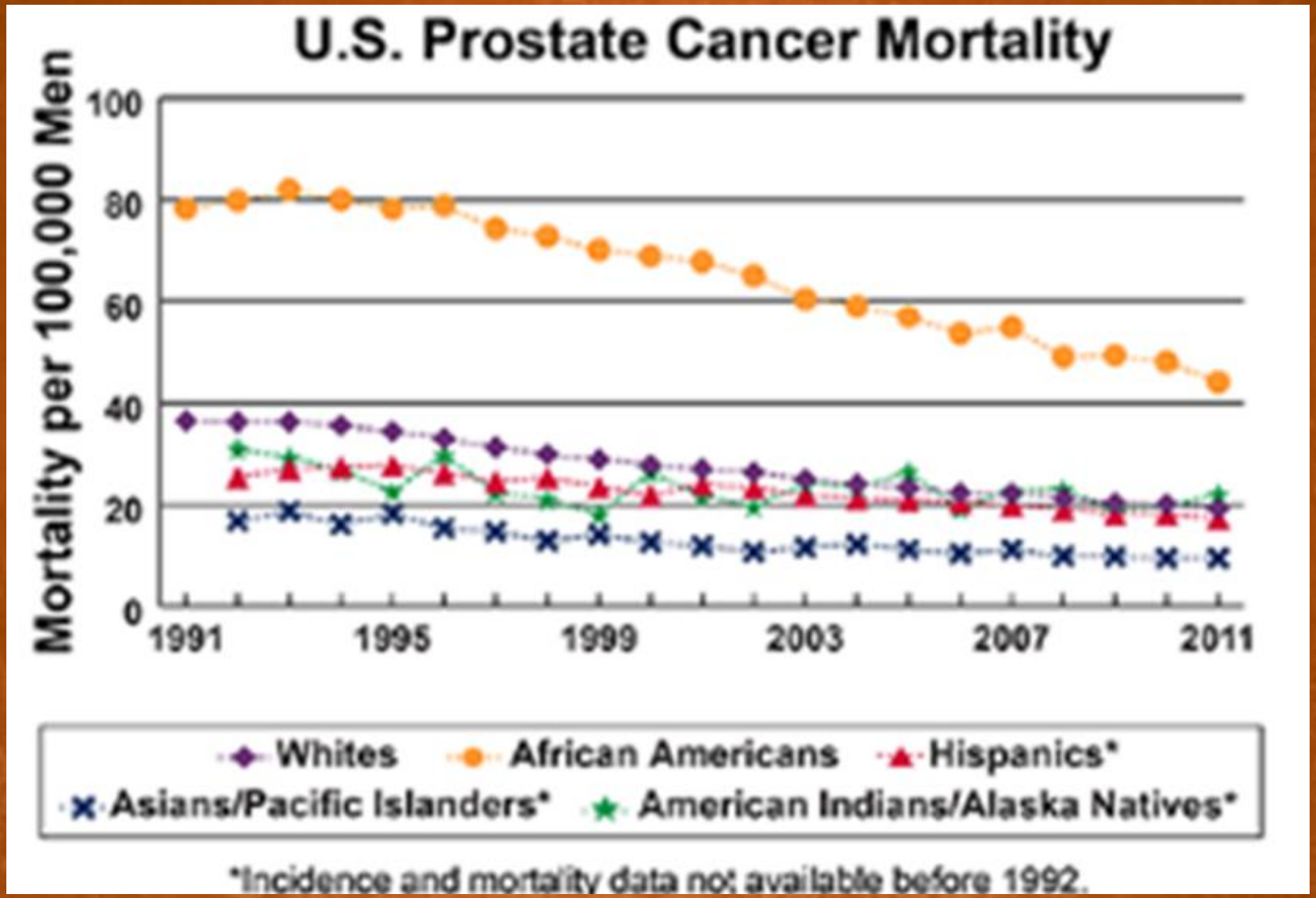

AUGUST 18, 2014
TIME
Manopause?!
Aging, insecurity and the $2 billion testosterone industry
BY DAVID VON DREHLE
time.com


LowT
Center

Hypothesized Causal Pathway




U.S. Prostate Cancer Incidence
Incidence per 100,000 Men
350
300
250
200
150
100
50
0
1991
1995
1999
2003
2007
2011
Whites
African Americans
Hispanics*
Asians/Pacific Islanders*
American Indians/Alaska Natives*
*Incidence and mortality data not available before 1992.


U.S. Prostate Cancer Mortality
Mortality per 100,000 Men
100
80
60
40
20
0
1991
1995
1999
2003
2007
2011
Whites
African Americans
Hispanics*
Asians/Pacific Islanders*
American Indians/Alaska Natives*
*Incidence and mortality data not available before 1992.

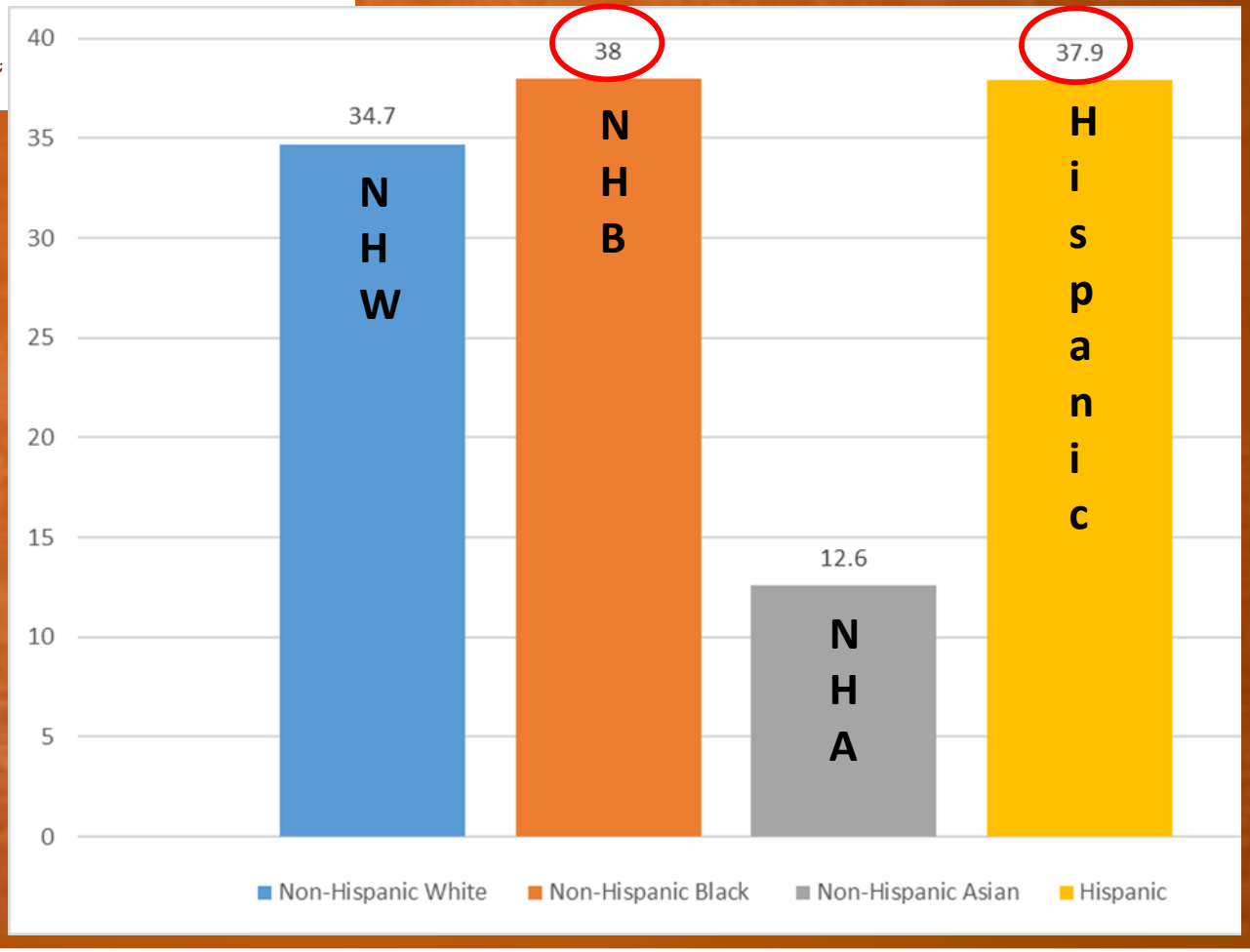
Prevalence of Obesity in Men

Research

Original Investigation

Trends in Obesity Among Adults in the United States, 2005 to 2014

Katherine M. Flegal, PhD; Deanna Kruszon-Moran, MS; Margaret D. Carroll, MSPH; Cheryl D. Fryar, MSPH; Cynthia L. Ogden, PhD



Obesity and Prostate Cancer

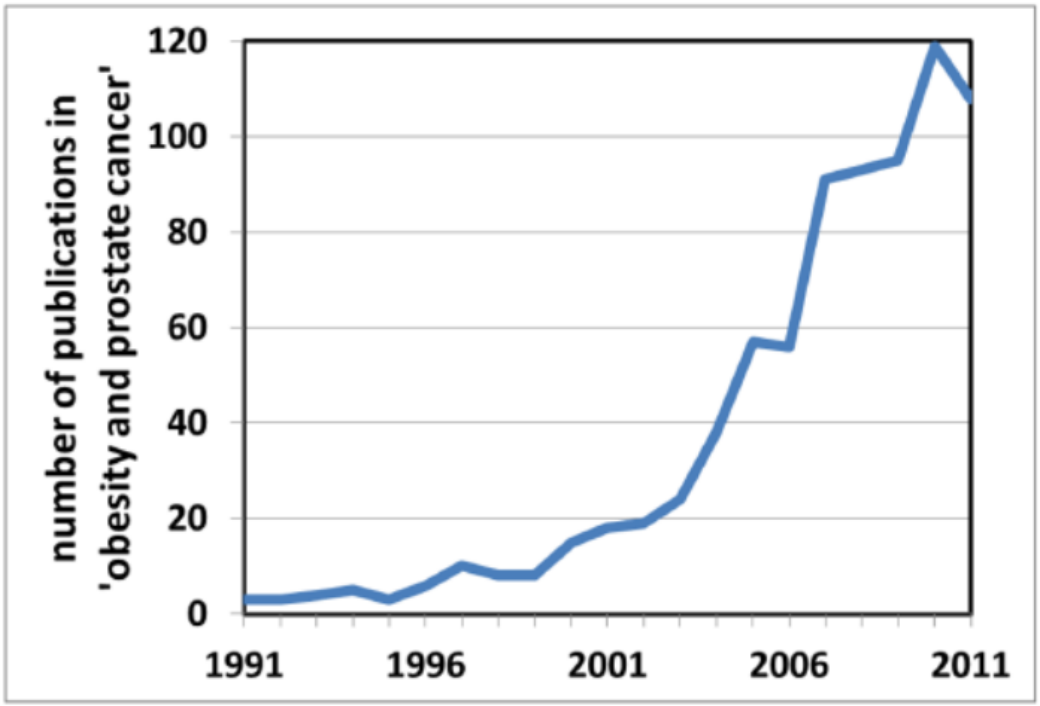
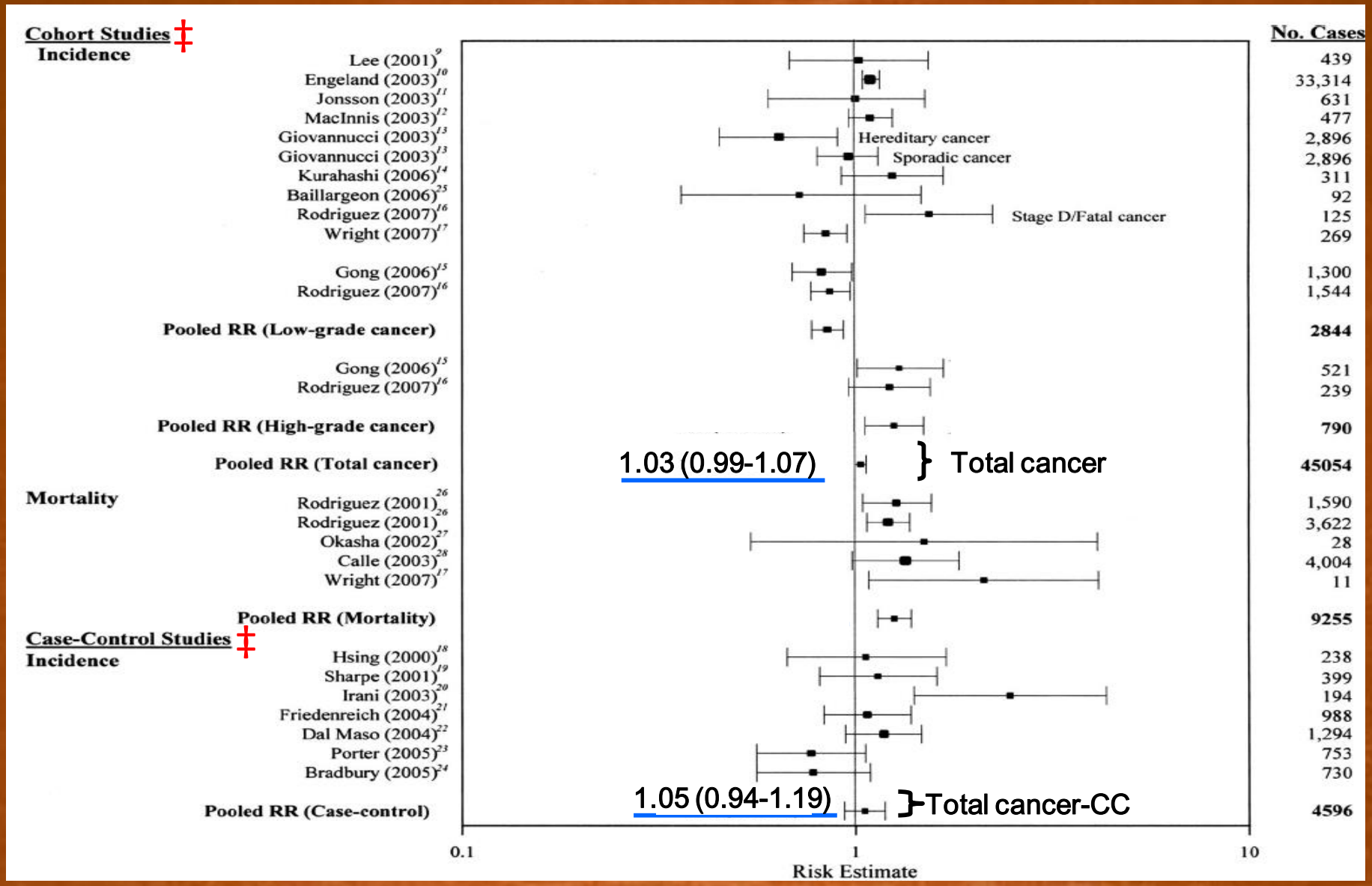


Fig. 1.
Using the search terms *obesity* and *prostate cancer*, the number of PubMed publications has increased in the past 20 yr.

Allot et al, *Eur Urol*, 2013



***Recent meta-analyses of prospective studies show similar observations w/ localized and advanced PCa**

Hsing et al, Am Jrn Clinical Nutri, 2007

Discacciati et al, Annals of Oncology, 2012

Prostate cancer in Mexican-Americans

The Prostate 68:563 – 570 (2008)

Prostate Cancer in Mexican-Americans: Identification of Risk Factors

Sara S. Strom,[1]* Yuko Yamamura,[1] F. Nery Flores-Sandoval,[2]
Curtis A. Pettaway,[3] and David S. Lopez[1]

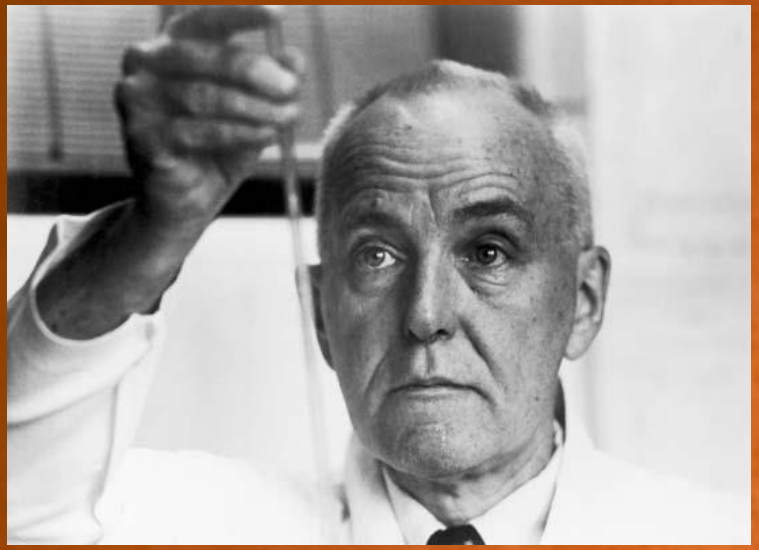
[1]*The University of Texas M.D. Anderson Cancer Center, Department of Epidemiology, Houston, Texas*
[2]*St. Luke's Episcopal Hospital, Department of Urology, Houston, Texas*
[3]*The University of Texas M.D. Anderson Cancer Center, Department of Urology, Houston, Texas*

Prostate cancer in Mexican-Americans

TABLE IV. Prostate Cancer Risk Factors by Clinical Stage at Diagnosis

	Organ-confined (N = 127)		Regionally advanced/metastatic (N = 49)	
Variable	Univariable OR (95% CI)	Multivariable OR[a] (95% CI)	Univariable OR (95% CI)	Multivariable OR[a] (95% CI)
Obese at diagnosis				
No	1.00	—	1.00	1.00
Yes	1.07 (0.65–1.75)	—	1.90 (1.00–3.65)	2.40 (1.11–5.15)

What is the biological mechanism involved in the association between obesity and prostate cancer?



Charles Huggins

Circa 1941

Studies on Prostatic Cancer

I. The Effect of Castration, of Estrogen and of Androgen Injection on Serum Phosphatases in Metastatic Carcinoma of the Prostate*

Charles Huggins, M.D., and Clarence V. Hodges, M.D.

Huggins C. et al. Cancer Res. 1941:1; 293

- Castration decreased acid phosphatase in men with metastatic PCa
- Testosterone administration raised acid phosphatase
- “Cancer of the prostate is activated by testosterone injections.”
- Huggins awarded Nobel Prize 1966

The Year 2007—Post Doctoral Fellowship

JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

Hormone Demonstration Program

What is the relationship between race/ethnicity and sex steroid hormones in adults (n=1,413)- National Health and Nutrition and Examination Survey (NHANES III)?

0021-972X/07/$15.00/0
Printed in U.S.A.

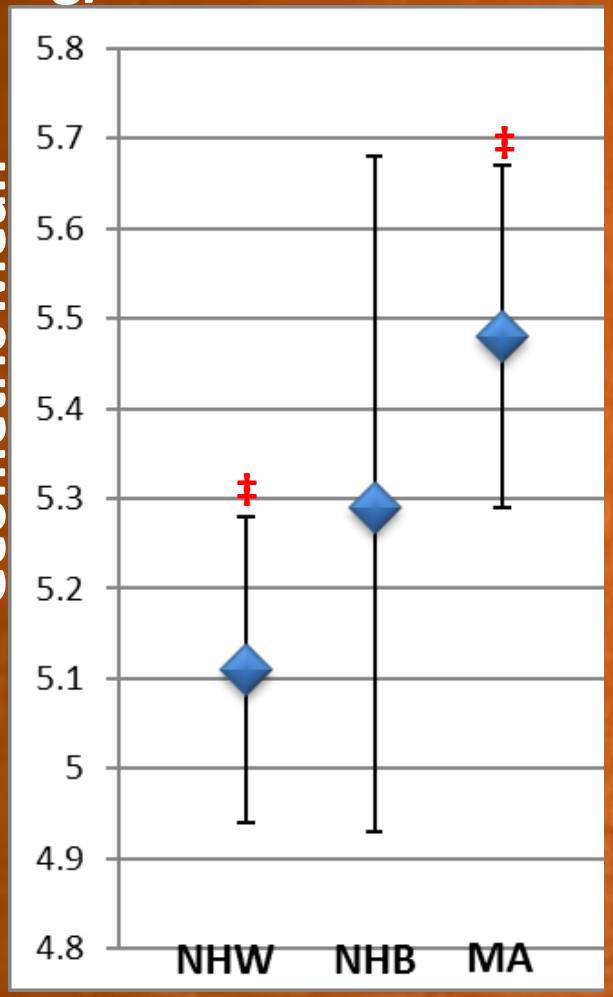
The Journal of Clinical Endocrinology & Metabolism 92(7):2519–2525

doi: 10.1210/jc.2007-0028

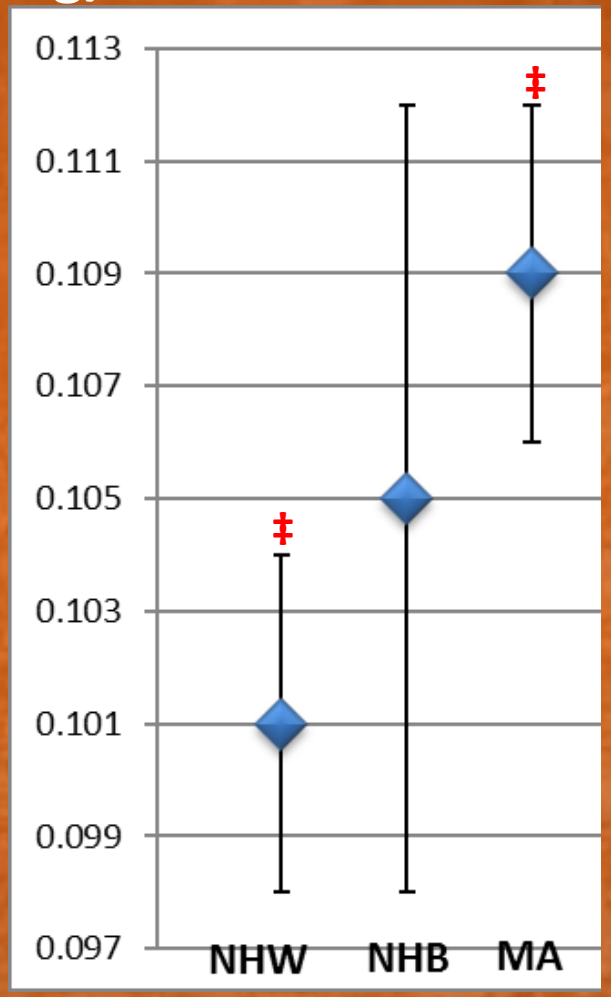
Serum Estrogen, But Not Testosterone, Levels Differ between Black and White Men in a Nationally Representative Sample of Americans

Sabine Rohrmann, William G. Nelson, Nader Rifai, Terry R. Brown, Adrian Dobs, Norma Kanarek, James D. Yager, and Elizabeth A. Platz

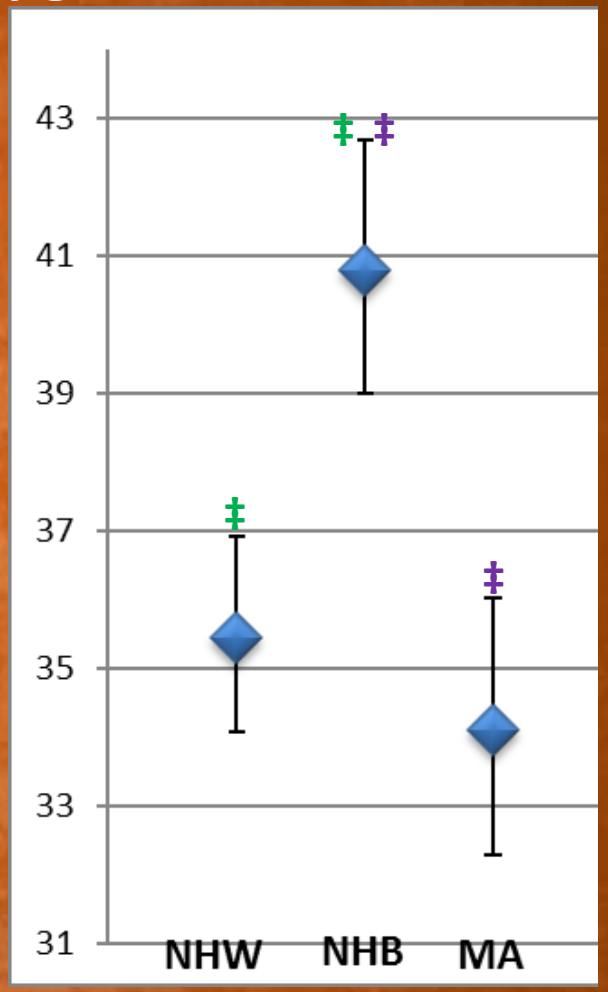
Total Testosterone, ng/ml



Free Testosterone, ng/ml



Estradiol, pg/ml



Model 1 is adjusted for age, BMI, smoking, alcohol consumption, and physical activity; model 2 is the same as model 1 but adjusted for percent body fat instead of BMI; percent body fat is missing for 118 men. MA, Mexican-American; NHB, non-Hispanic black; NHW, non-Hispanic white.
[a,b] NHW *vs.* MA: [a] $P < 0.05$; [b] $P < 0.01$.
[c,d] NHW *vs.* NHB: [c] $P < 0.05$; [d] $P < 0.01$.
[e,f] NHB *vs.* MA: [e] $P < 0.05$; [f] $P < 0.01$.

What is the relationship between race/ethnicity and sex steroid hormones in adolescents (n=134)- NHANES III?

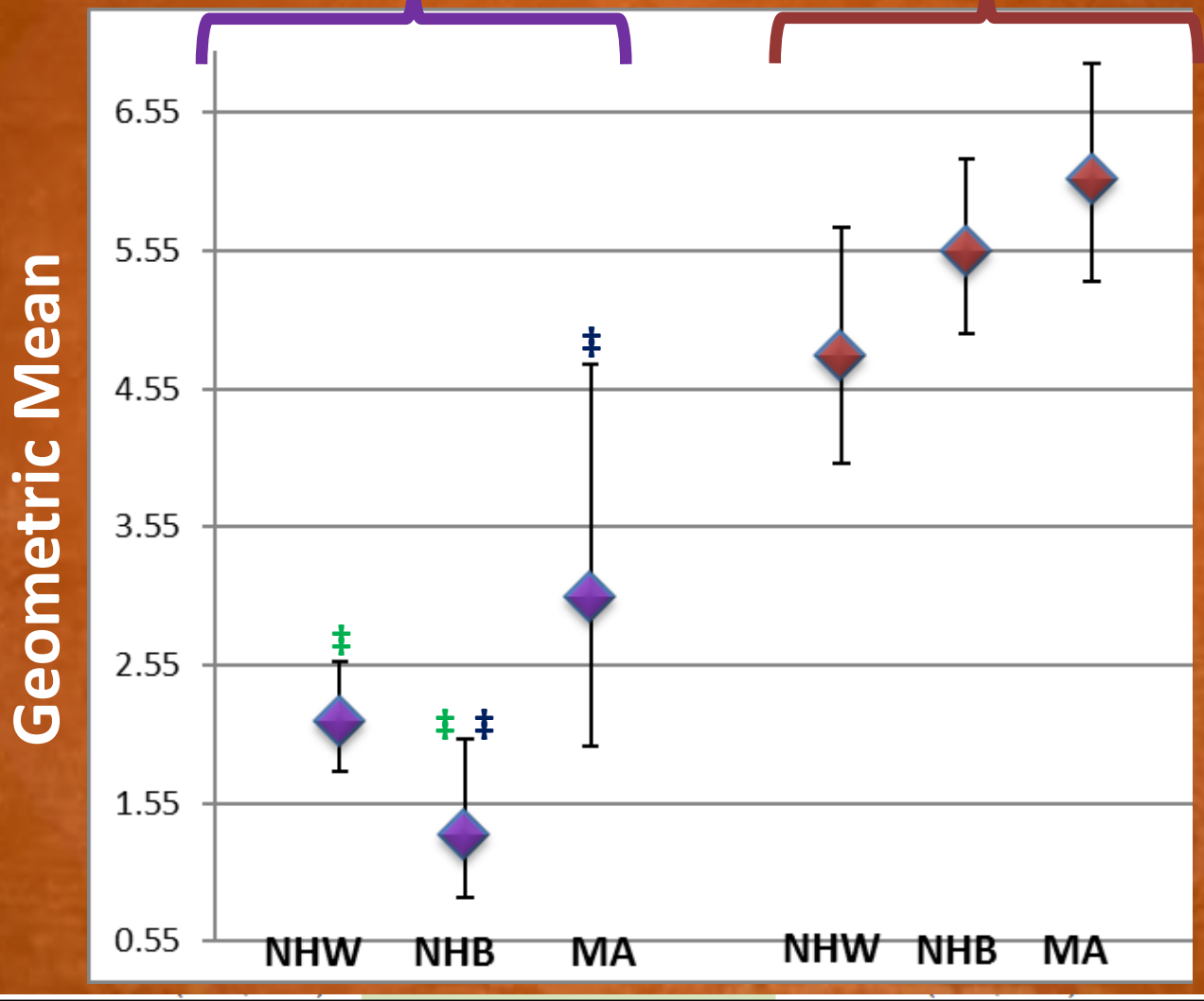
Published in final edited form as:
Cancer Causes Control. 2013 April ; 24(4): . doi:10.1007/s10552-013-0154-8.

Racial/ethnic differences in serum sex steroid hormone concentrations in US adolescent males

David S. Lopez[1,2], **Sarah B. Peskoe**[1], **Corinne E. Joshu**[1], **Adrian Dobs**[3,4], **Manning Feinleib**[1], **Norma Kanarek**[4,5], **William G. Nelson**[4,5,6,7], **Elizabeth Selvin**[1], **Sabine Rohrmann**[8], and **Elizabeth A. Platz**[1,4,6]

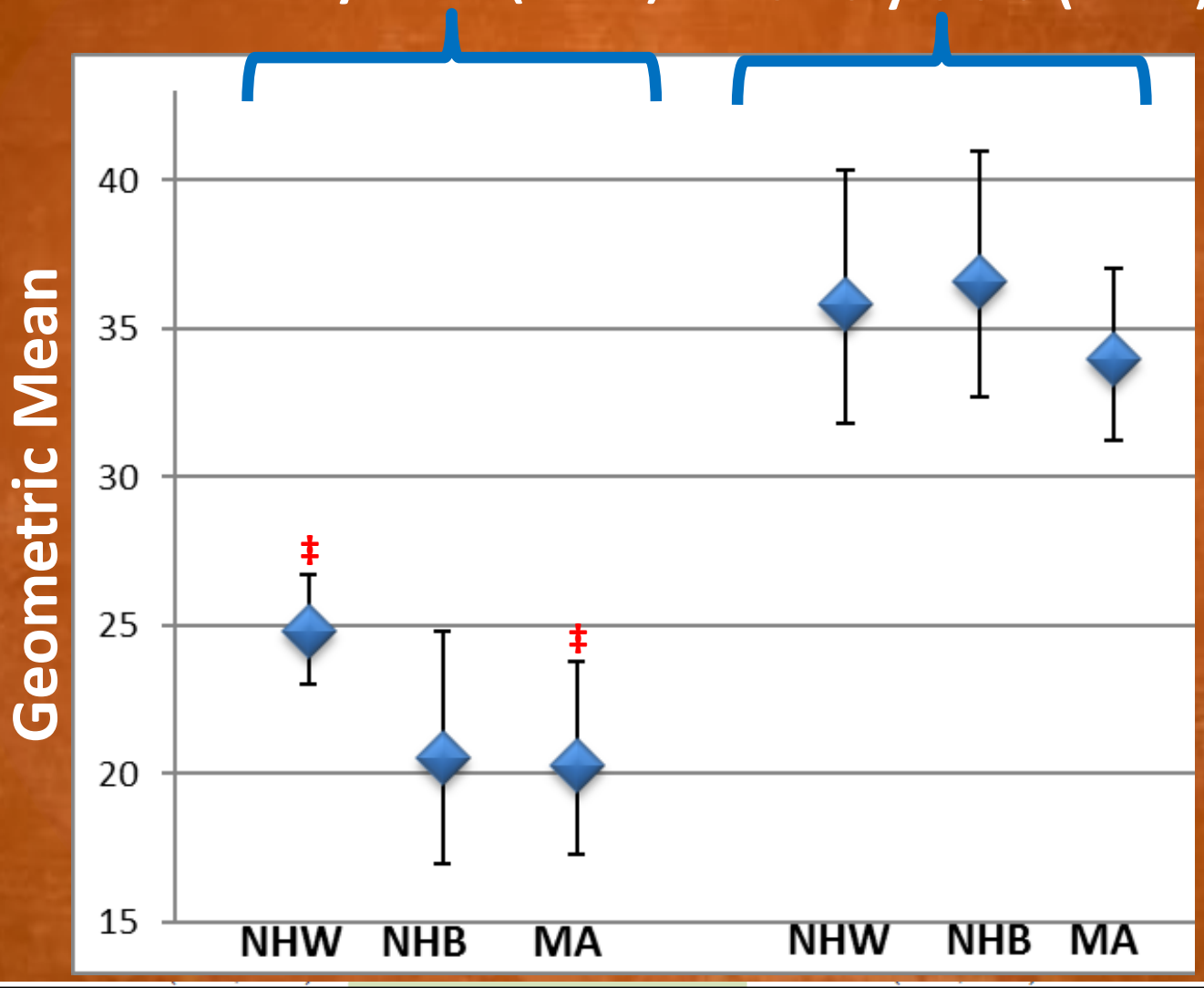
Testosterone, ng/ml

12-15 yrs old (n=57) 16-19 yrs old (n=77)



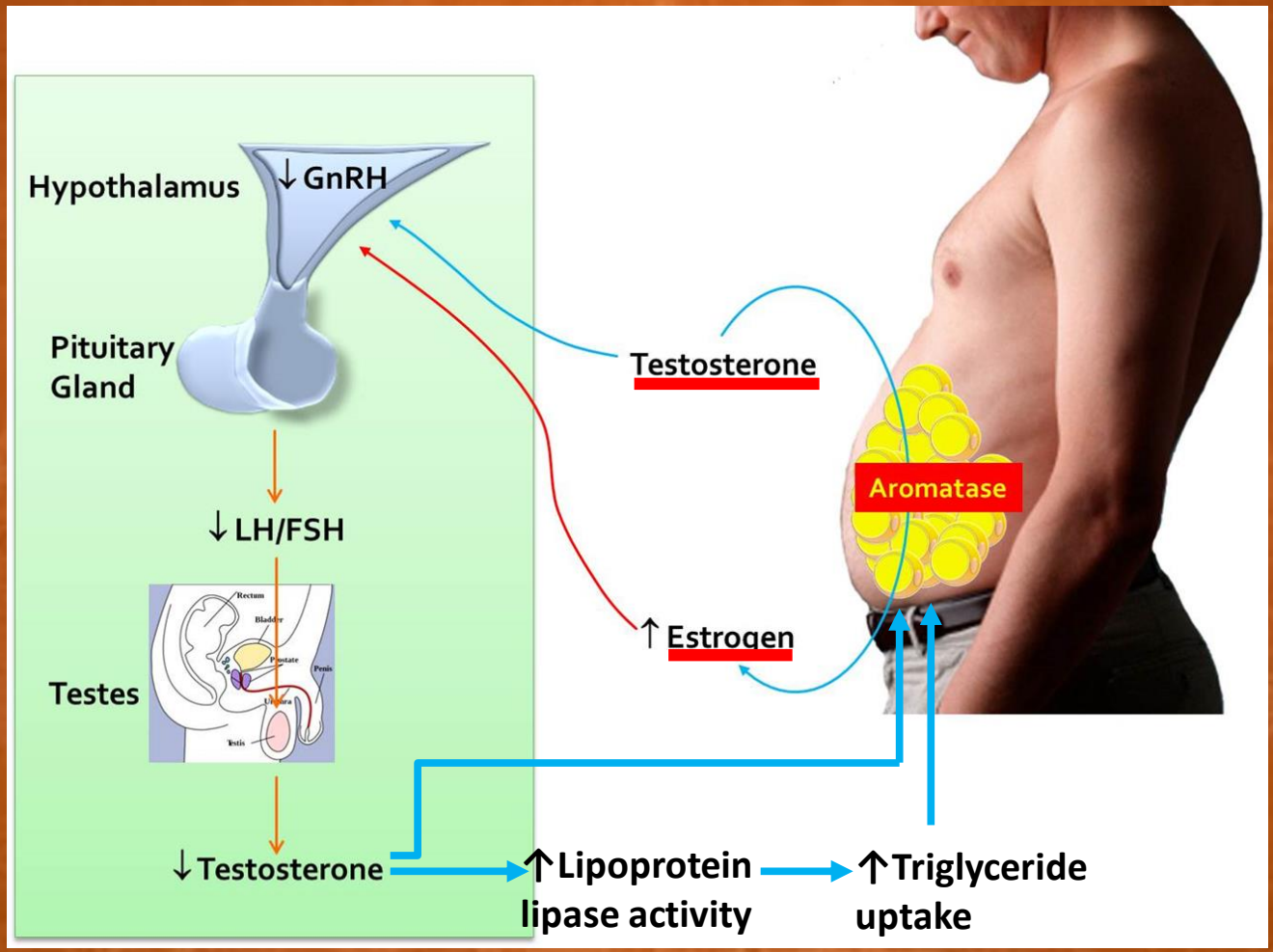
[a] Geometric mean adjusted for age, Tanner stage, percent body fat, waist circumference, frequency of physical activity, cotinine (as an indicator of tobacco smoke exposure), and mutually for the other hormones (total testosterone, total estradiol, and SHBG; free testosterone and free estradiol).

Estradiol, pg/ml



[a] Geometric mean adjusted for age, Tanner stage, percent body fat, waist circumference, frequency of physical activity, cotinine (as an indicator of tobacco smoke exposure), and mutually for the other hormones (total testosterone, total estradiol, and SHBG; free testosterone and free estradiol).

Testosterone and Obesity?



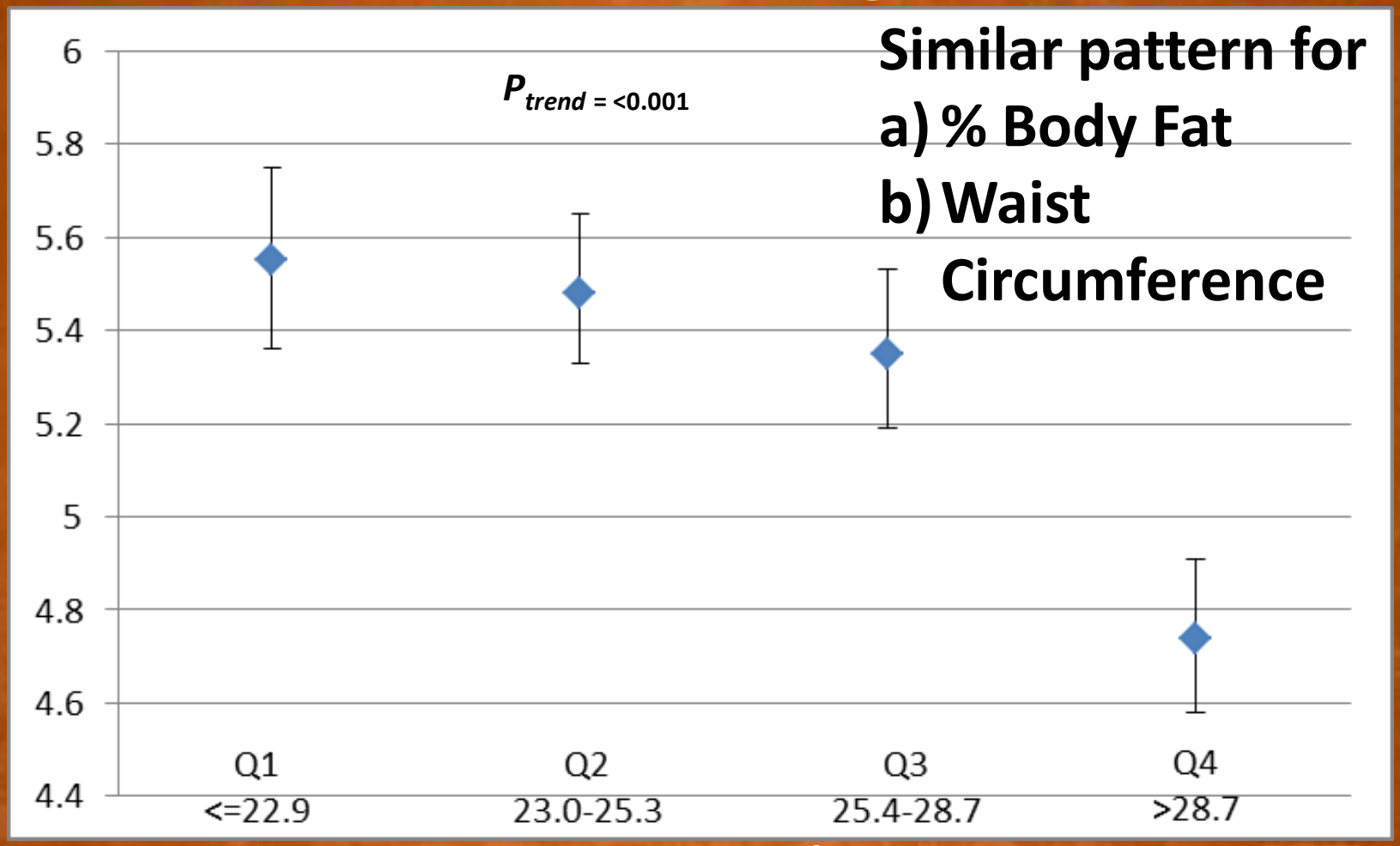
What is the role of body fatness in sex steroid hormones among adult men (n=1,265) - NHANES III?

Published in final edited form as:
Cancer Causes Control. 2011 August ; 22(8): . doi:10.1007/s10552-011-9790-z.

Body fatness and sex steroid hormone concentrations in US men – Results from NHANES III

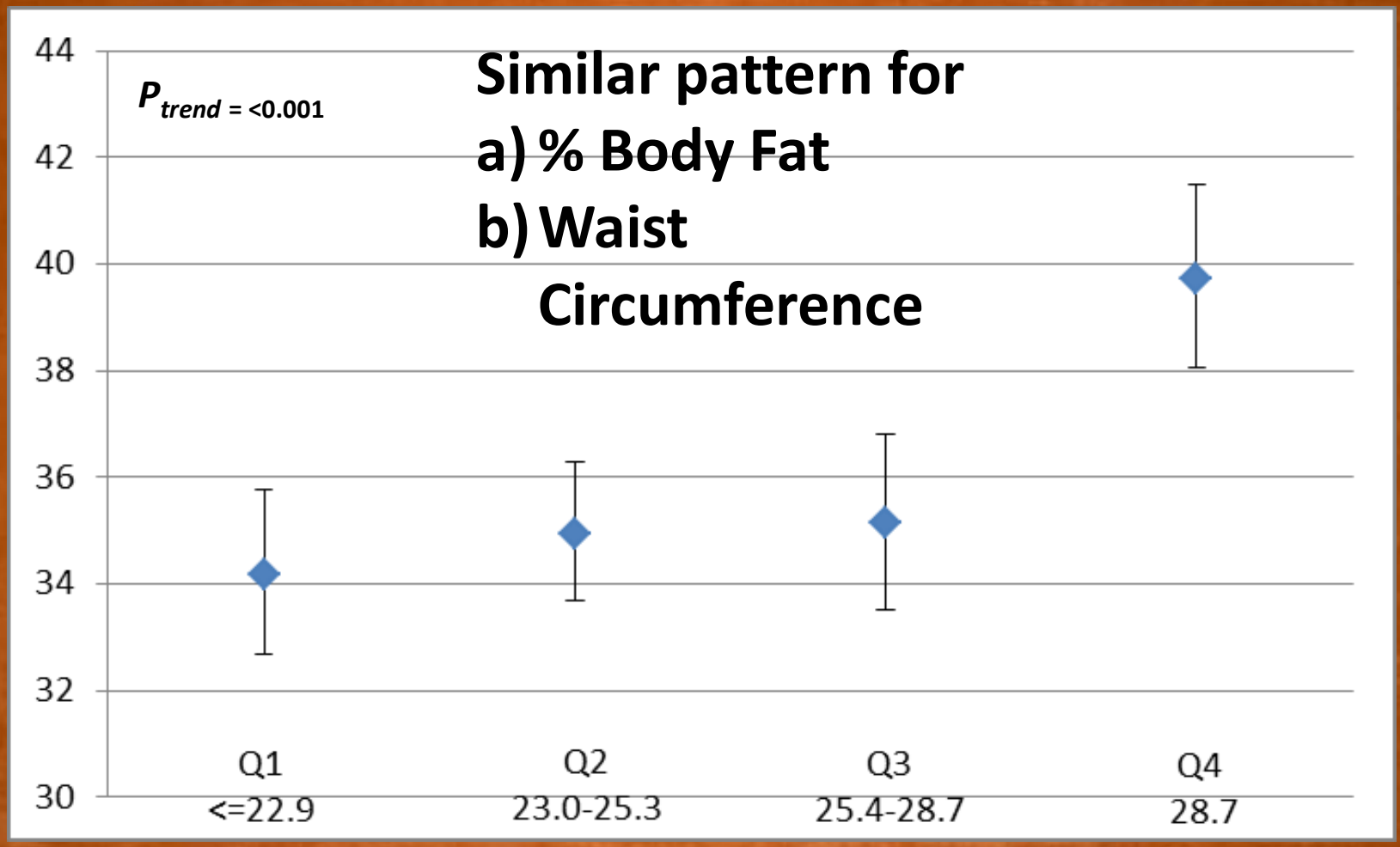
Sabine Rohrmann[1], **Meredith S. Shiels**[2], **David S. Lopez**[2], **Nader Rifai**[3], **William G. Nelson**[4,5,6,7], **Norma Kanarek**[4,7], **Eliseo Guallar**[2,8], **Andy Menke**[2,8], **Corinne E Joshu**[2], **Manning Feinleib**[2], **Siobhan Sutcliffe**[9], and **Elizabeth A. Platz**[2,4,5]

Testosterone (ng/mL)



Adjusted for age, race/ethnicity, smoking, alcohol, physical activity, plus testosterone, estradiol, and SHBH mutually adjusted and free testosterone and free estradiol mutually adjusted.

Estradiol (pg/mL)



Adjusted for age, race/ethnicity, smoking, alcohol, physical activity, plus testosterone, estradiol, and SHBH mutually adjusted and free testosterone and free estradiol mutually adjusted.

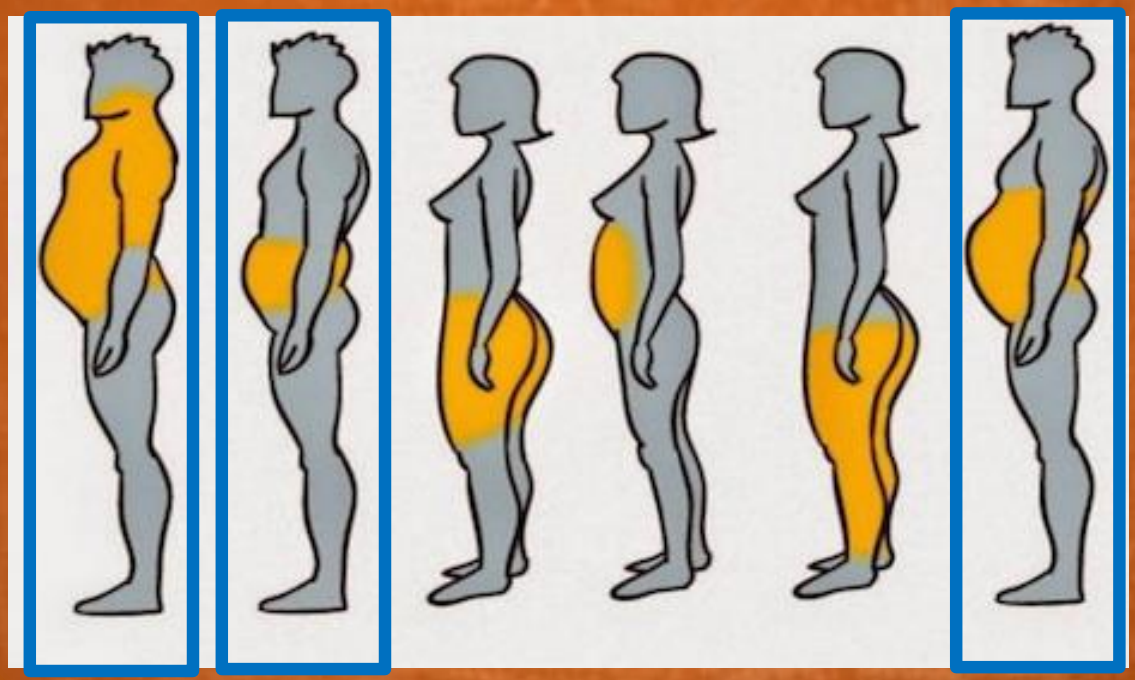
Time to Think

- Incidence and mortality rates of PCa higher in African Americans
- Hugging et al. suggested that higher levels of testosterone increased risk of prostate cancer
- Obesity decreases the risk of low-grade/localized PCa, but increases the risk of high-grade/advanced PCa.
- And obesity decreases testosterone levels

HOWEVER,

- We did not see high levels of testosterone in African Americans. Mexican Americans had higher testosterone levels, but they have lower rates of PCa
- If obesity reduces testosterone, how does obesity increase the risk of high-grade/advanced PCa?

Measurements of Adiposity, Body Fatness, and Race/Ethnicity



What is the association of overall and central body fatness with sex steroid hormones in adult men (n=1,243) and does it vary by race/ethnicity in NHANES III?

Racial/ethnic differences in the associations of overall and central body fatness with circulating hormones and metabolic factors in US men

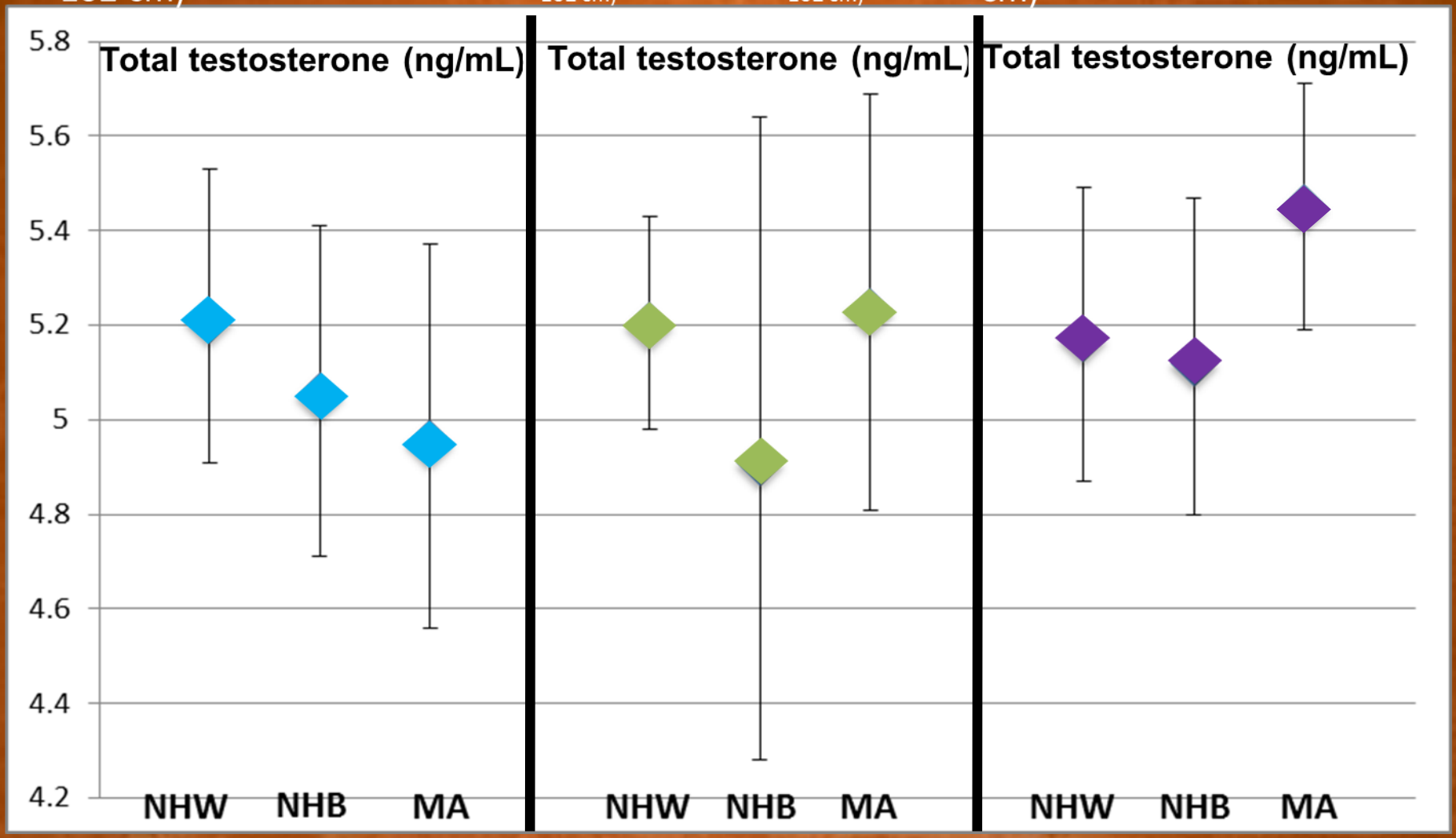
David S. Lopez[1,2], Sabine Rohrmann[3], Sarah B. Peskoe[4], Corinne E. Joshu[4,5], Konstantinos K. Tsilidis[6,7], Elizabeth Selvin[4], Adrian S. Dobs[5,8], Norma Kanarek[5,9], Steven Canfield[2], William G. Nelson[5,8,10], Elizabeth A. Platz[4,5,10]

Submitted to *International Journal of Endocrinology and Metabolism*

Obese by both measures: High % Body Fat (≥ 25%) and High Waist Circumference (≥ 102 cm)

Obese by one measure: High % Body Fat (≥ 25%) and Normal Waist Circumference (< 102 cm) **OR** Normal % Body Fat (< 25%) and High Waist Circumference (≥ 102 cm)

Non-obese both measure: Normal % Body Fat (< 25%) Normal Circumference (< 102 cm)

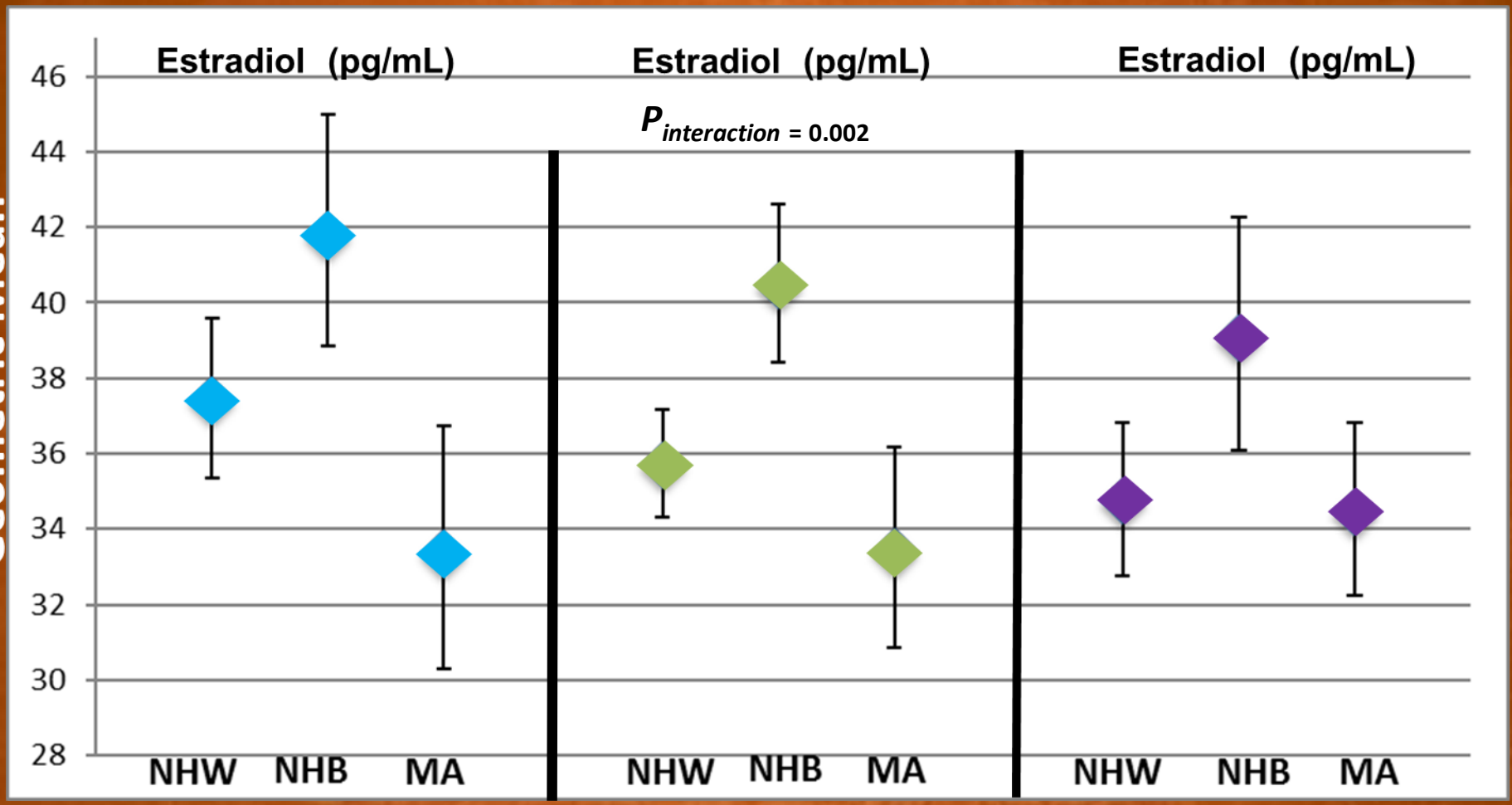


*Adjusted for age, cigarette smoking status, cotinine concentration, alcohol consumption, physical activity, percent body fat, and waist circumference.

Obese by both measures: High % Body Fat (≥ 25%) and High Waist Circumference (≥ 102 cm)

Obese by one measure: High % Body Fat (≥ 25%) and Normal Waist Circumference (< 102 cm) **OR** Normal % Body Fat (< 25%) and High Waist Circumference (≥ 102 cm)

Non-obese both measure: Normal % Body Fat (< 25%) Normal Circumference (< 102 cm)



*Adjusted for age, cigarette smoking status, cotinine concentration, alcohol consumption, physical activity, percent body fat, and waist circumference.

What about prostate-specific antigen (PSA) test?

Strongly correlated to testosterone and it is still used for disease progression / risk stratification

JOURNAL OF MEN'S HEALTH
Volume 11, Number 4, 2014

DOI: 10.1089/jomh.2014.0058

Racial and Ethnic Differences in the Association of Metabolic Syndrome with Prostate-Specific Antigen Levels in U.S. Men: NHANES 2001–2006

David S. Lopez, DrPH, MPH, MS,[1,2] Shailesh Advani, MPH,[1,3] Konstantinos K. Tsilidis, PhD,[4] Mike Hernandez, MS,[5] Elaine Symanski, PhD,[1] Sara S. Strom, PhD,[3] Arup Sinha, MS,[6] and Steven Canfield, MD[2]

NHANES 2001-2006 n=3528- Objectives:

1. Determine the association of PSA with the 3 definitions of metabolic syndrome (ATP, IDF and WHO)
2. Investigate whether the relationship of PSA with metabolic syndrome varies by race and ethnicity

Adult Treatment Panel III (ATP III)[a]

Any 3 or more of the following criteria:

1. **Waist Circumference (WC)**
   - Men: ≥ 102 cm
2. **Blood Pressure (BP)**[b]
   - SBP ≥ 130 mmHg
     OR
   - DBP ≥ 85 mmHg
3. **HDL Cholesterol**
   - Men: < 40 mg/dL
4. **Serum Triglycerides**
   - ≥ 150 mg/dL
5. **Fasting Plasma Glucose**
   - ≥ 110 mg/dL

International Diabetes Federation (IDF)[c]

Central obesity (defined as waist circumference) plus any two of the following four criteria:

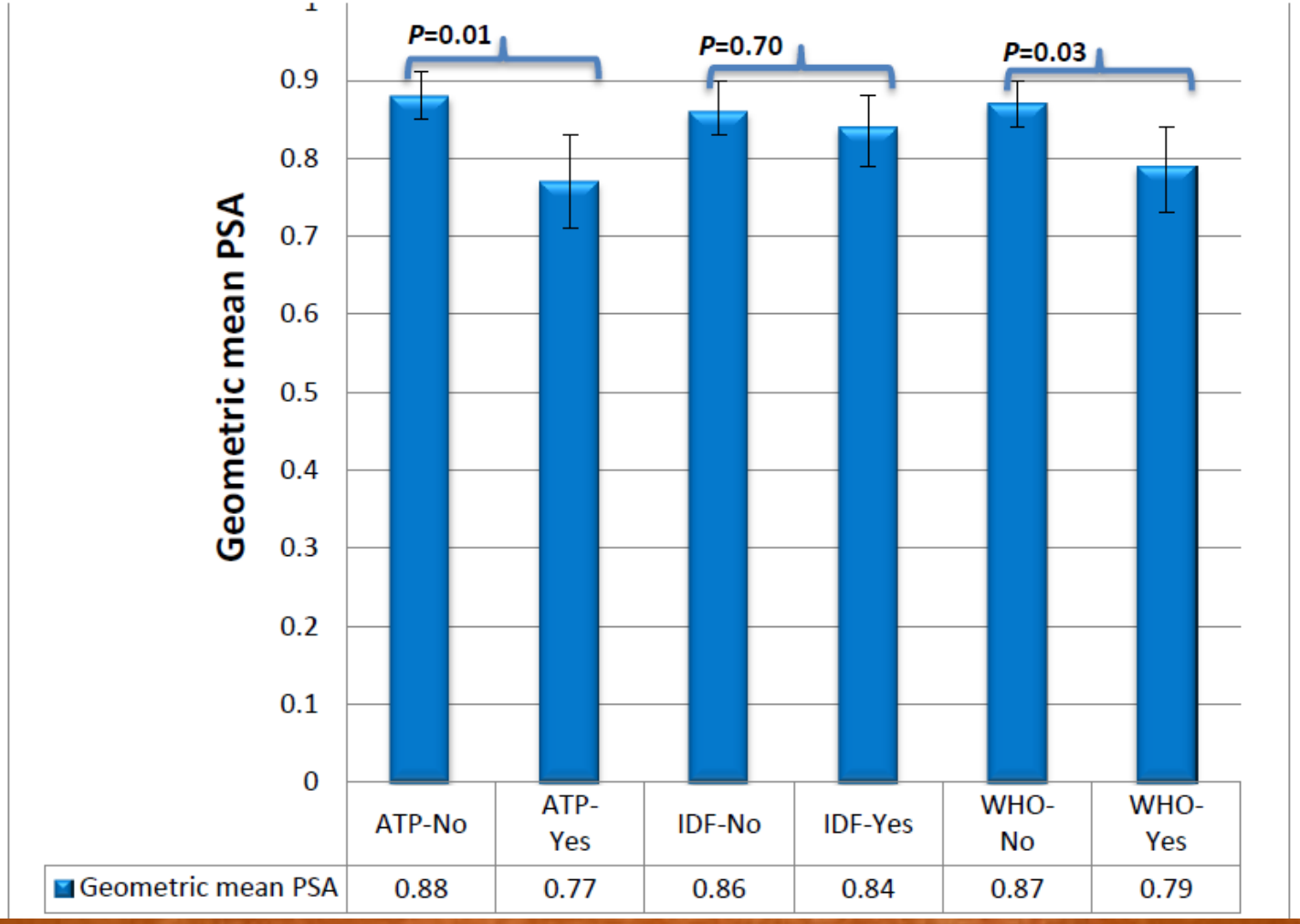
1. **Central obesity- waist circumference (WC)**
   - White men: ≥94 cm
   - Black men: ≥94 cm
   - Mexican-American men: ≥90 cm
2. **Blood Pressure (BP)**[d]
   - SBP ≥ 130 mmHg
     OR
   - DBP ≥ 85 mmHg
3. **HDL Cholesterol**
   - Men: < 40 mg/dL
4. **Serum Triglycerides**
   - ≥ 150 mg/dL
5. **Fasting Plasma Glucose**[e]
   - ≥ 100 mg/dL

World Health Organization (WHO)[f]

Insulin resistance[f] *or Diabetes*[f] *and at least two of the following criteria:*

1. **Body Mass Index (BMI)**
   - ≥ 30 kg/m^2
     AND/OR
   Waist-to-Hip Ratio (WHR)
   - Men: ≥ 0.90
2. **Blood Pressure (BP)**[g]
   - ≥ 140/90 mmHg
     OR
   - DBP ≥ 90 mmHg
3. **HDL Cholesterol**
   - Men: < 35 mg/dL
     AND/OR
   Serum Triglycerides
   - ≥ 150 mg/dL
4. **Albumin-to-creatinine ratio**
   - ≥ 30 mg/g

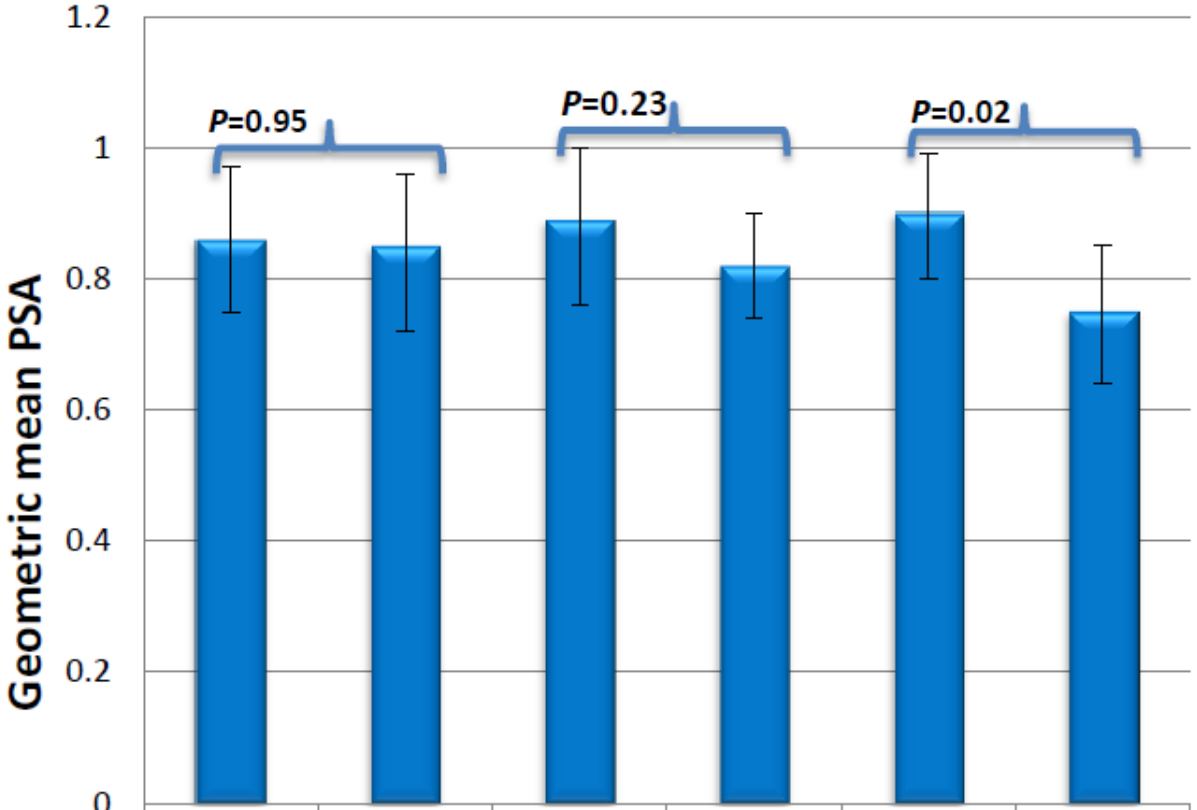
Multivariable-adjusted geometric mean (95% confidence interval) of PSA by metabolic syndrome definitions, ATP, IDF and WHO.



	ATP-No	ATP-Yes	IDF-No	IDF-Yes	WHO-No	WHO-Yes
Geometric mean PSA	0.88	0.77	0.86	0.84	0.87	0.79

[b]Model 1, geometric mean adjusted for age.
[c]Model 2, geometric mean adjusted for age, smoking, moderate and vigorous physical activity, and plasma volume.

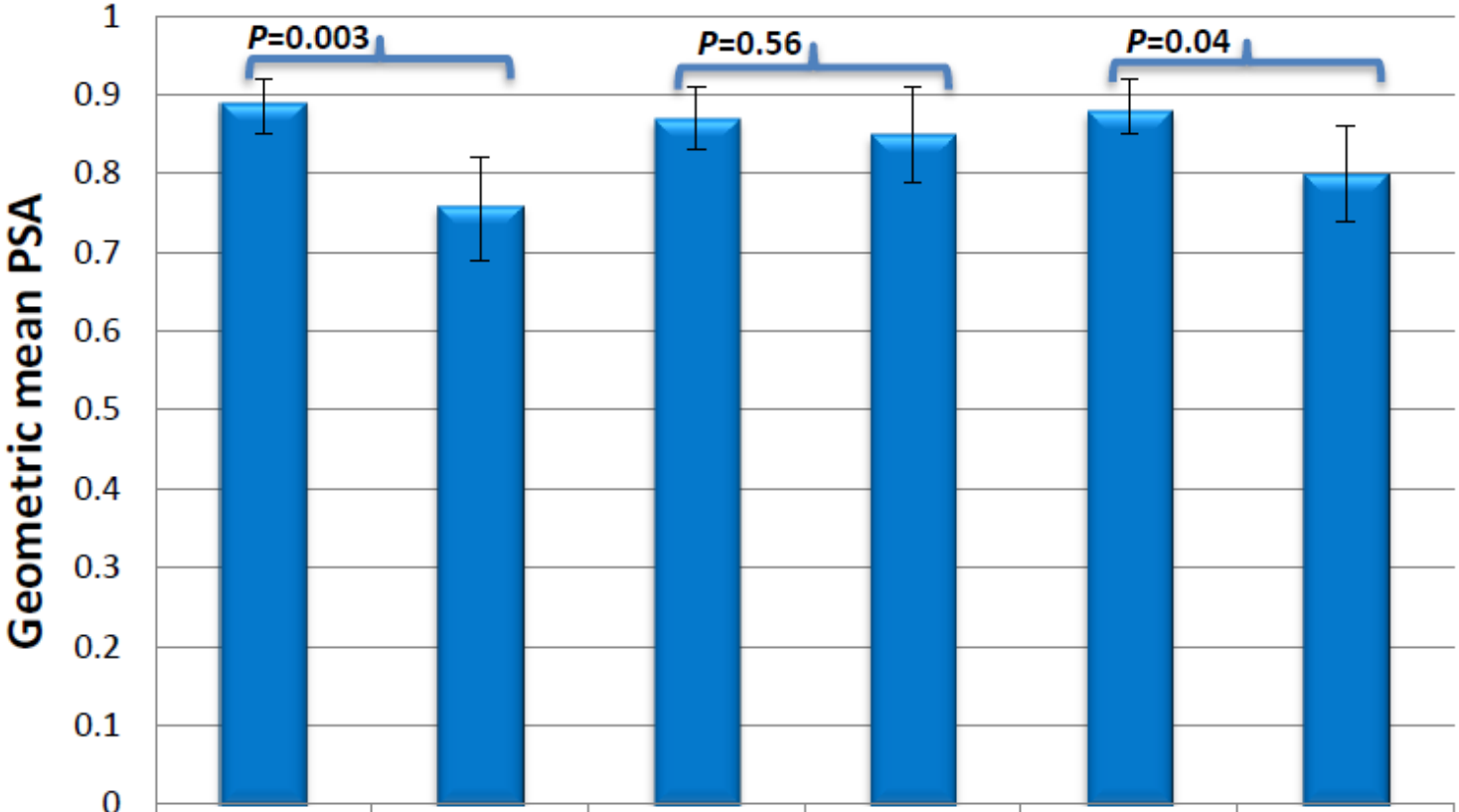
Mexican Americans- Adjusted Geometric mean PSA by ATP, IDF, and WHO*



	ATP-No	ATP-Yes	IDF-No	IDF-Yes	WHO-No	WHO-Yes
Geometric mean PSA	0.86	0.85	0.89	0.82	0.9	0.75

[b]Model 1, geometric mean adjusted for age.
[c]Model 2, geometric mean adjusted for age, smoking, moderate and vigorous physical activity, and plasma volume.

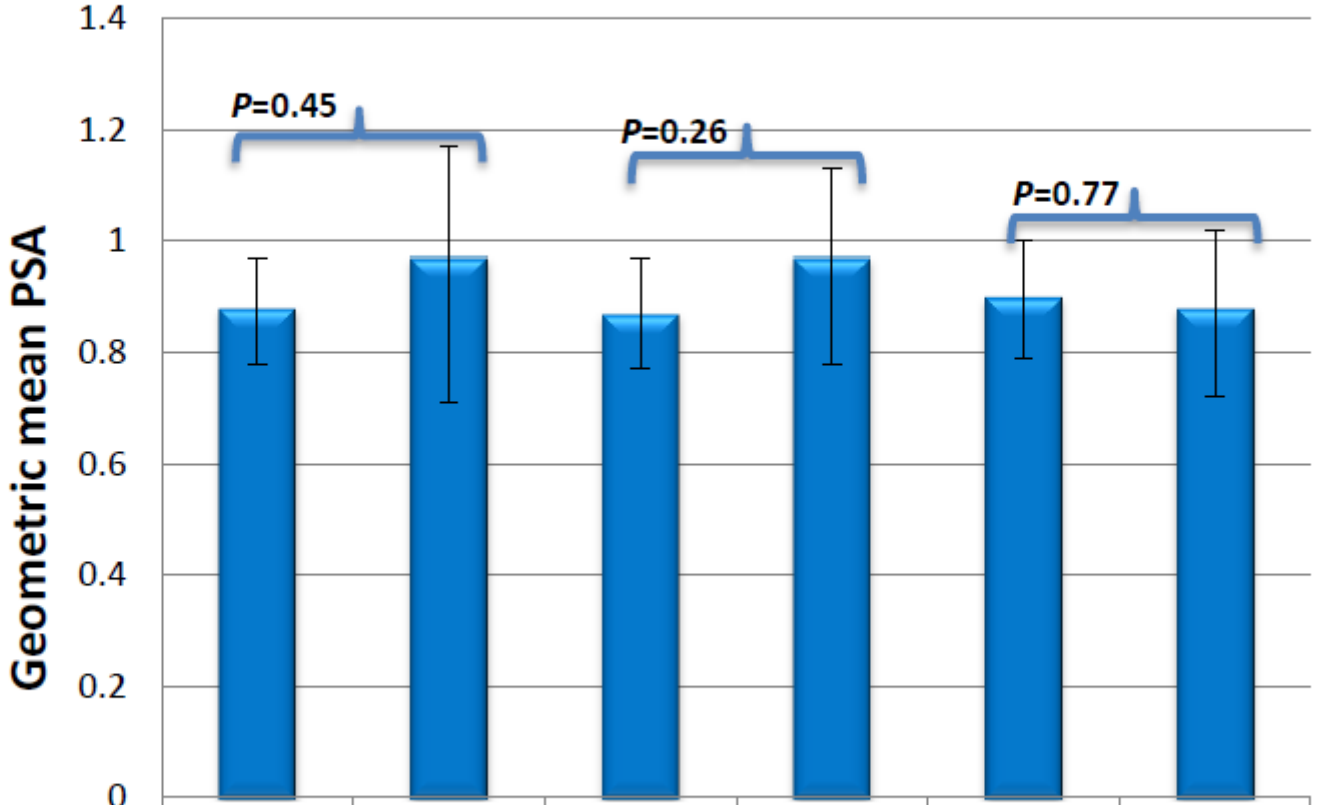
Non Hispanic Whites - Adjusted Geometric mean PSA by ATP, IDF, and WHO*



	ATP-No	ATP-Yes	IDF-No	IDF-Yes	WHO-No	WHO-Yes
Geometric Mean PSA	0.89	0.76	0.87	0.85	0.88	0.8

[b]Model 1, geometric mean adjusted for age.
[c]Model 2, geometric mean adjusted for age, smoking, moderate and vigorous physical activity, and plasma volume.

Non-Hispanic Black - Adjusted Geometric mean PSA by ATP, IDF and WHO*



	ATP-No	ATP-Yes	IDF-No	IDF-Yes	WHO-No	WHO-Yes
Geometric mean PSA	0.88	0.97	0.87	0.97	0.9	0.88

[b]Model 1, geometric mean adjusted for age.
[c]Model 2, geometric mean adjusted for age, smoking, moderate and vigorous physical activity, and plasma volume.

Mortality
&
Testosterone and Obesity

Mortality- Testosterone and Obesity

- **Testosterone deficiency (TD) is a common medical condition that is characterized by having total testosterone levels < 300 ng/dL**
- **Studies show that as many as 38.7% of men over 45y old[14] (24% among men 30-79y old[4]) demonstrate TD.**
- **In the United States, reports show that there are approximately 2.4 million 40-69 yrs men with TD.[17,18]**
- **Projected that by 2025 approximately 6.5 million American men aged 30 to 80 will suffer from TD.[4]**

A prospective analyses to determine whether the co-occurrence of testosterone deficiency and obesity increase the risk of death in US men- NHANES 1999-2004 & 2011 Mortality Data

Co-occurrence of testosterone deficiency and obesity associated with all-cause mortality in U.S. men

Authors: David S. Lopez, Xueting Qiu, Shailesh Advani, Konstantinos K. Tsilidis, Mohit Khera, Abraham Morgentaler, Rur

Introduction and obje testosterone ≤ 300 ng/c relationship between T unclear. Therefore, we circumference [WC] ≥ 1

Methods: The data wer a follow-up of mortality in men who participatec measured weight in kilc values of T deficiency a

Results: A median follc were fit to estimate haz was a 3.45 fold increas 8.02). No significant ass men had a 4.52 fold inc abdominal obesity had

Conclusion: Men with T deficiency and obesit

A total of 948 participants with a median follow-up time of 9.5 years

Characteristics	Death / Alive (142 / 806)
T deficiency (TD, ≤ 300 ng/dL) and Overall obesity (BMI ≥ 30 kg/m^2)	
No TD and No Overall obesity	63/449
TD / No Overall obesity	42/130
Overall obesity / No TD	10/111
TD and Overall obesity	27/116
T deficiency (TD, ≤ 300 ng/dL) and abdominal obesity (WC ≥ 102 cm)	
No TD / No Abdominal obesity	46/406
TD / No Abdominal obesity	26/90
Abdominal obesity / No TD	27/154
TD and Abdominal obesity	43/156

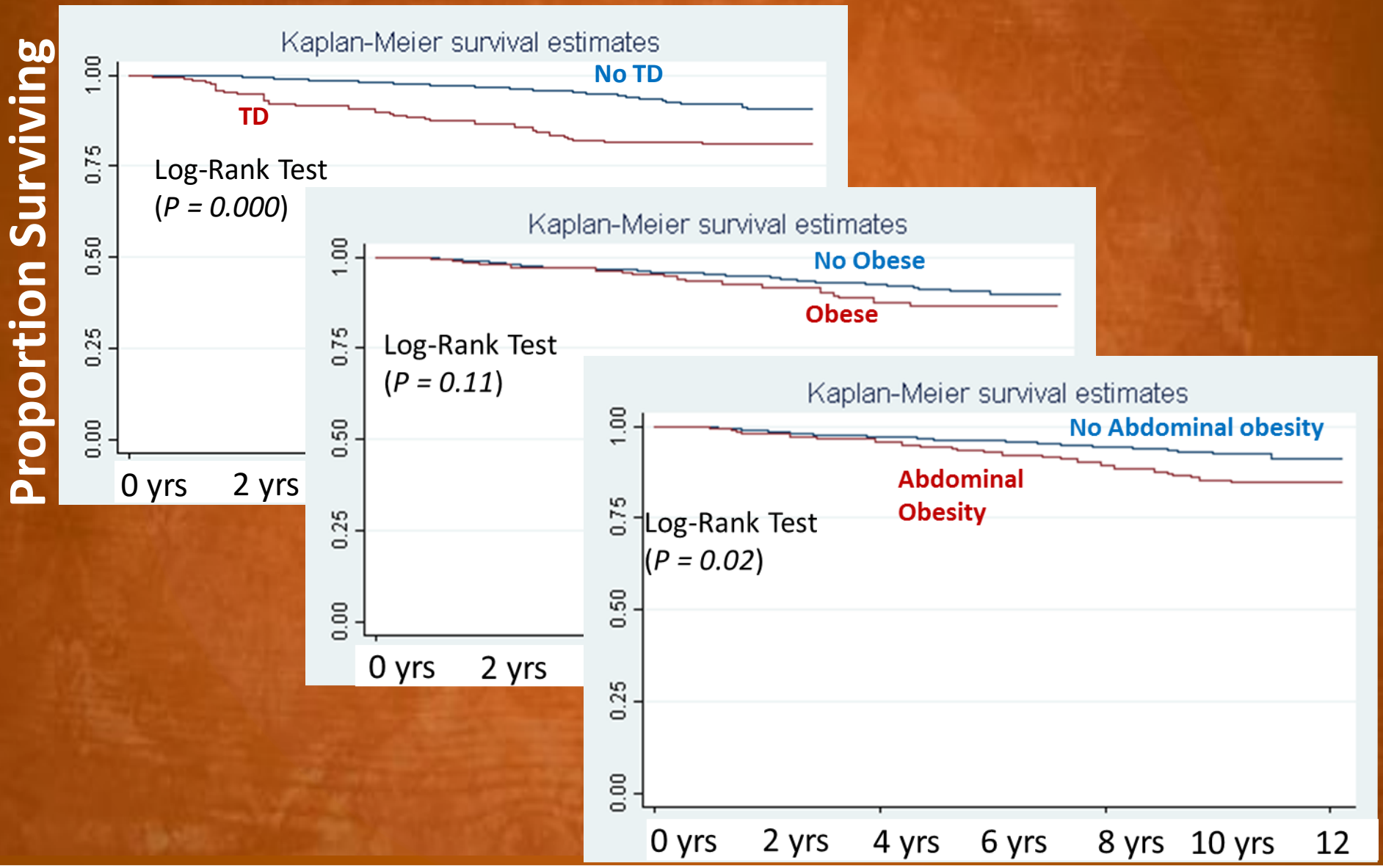
erone (T deficiency; total tes (U.S.). A bidirectional ealth outcomes remains or abdominal obesity (waist

l years old. The latter file was sex hormones were measured BMI was calculated from mbined the dichotomized

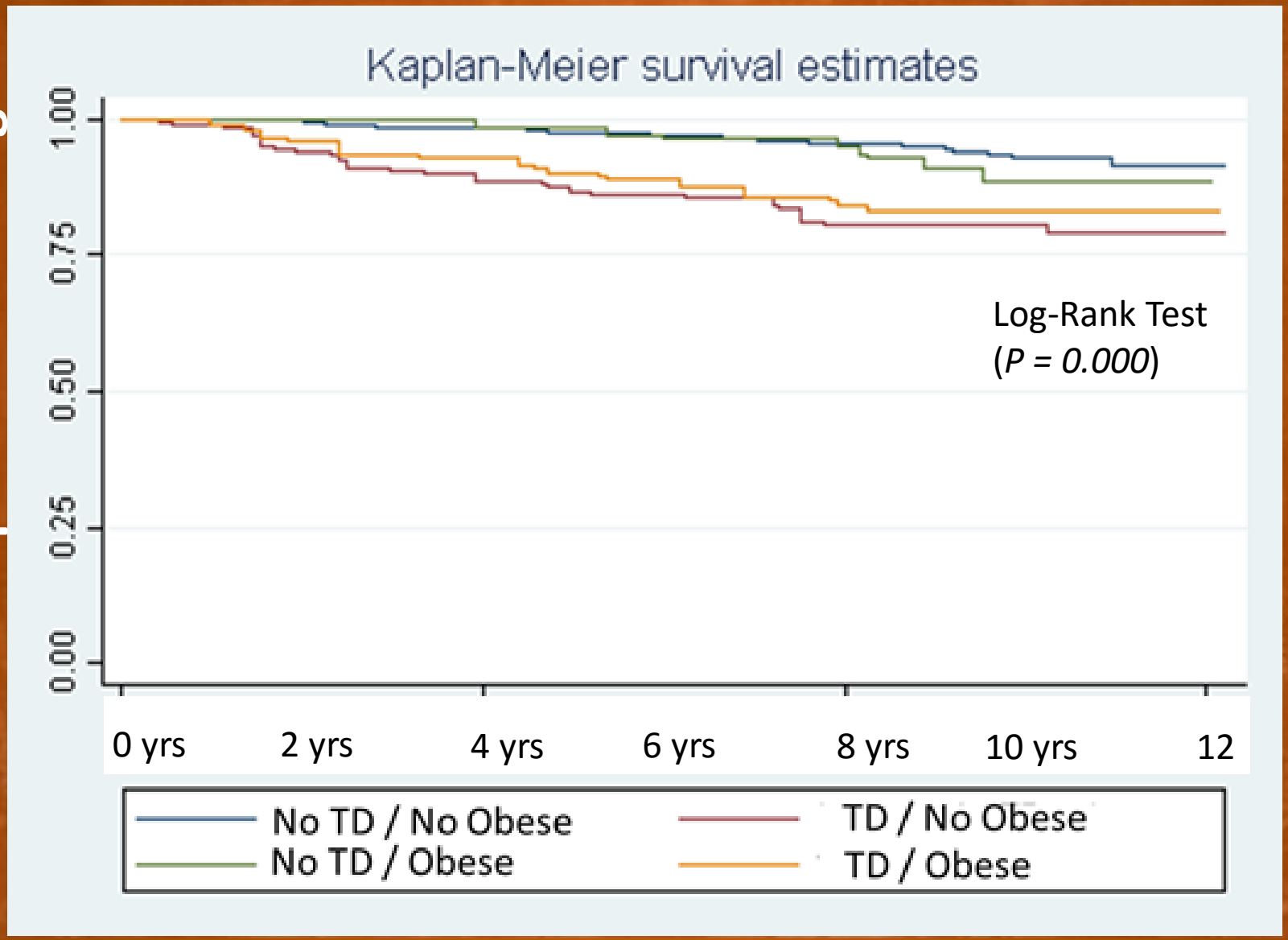
portional hazard models and physical activity. There lence interval [CI] = 1.48 – iency and overall obesity, rly, men with T deficiency and CI = 1.51 – 12.23).

. However, the effect of both

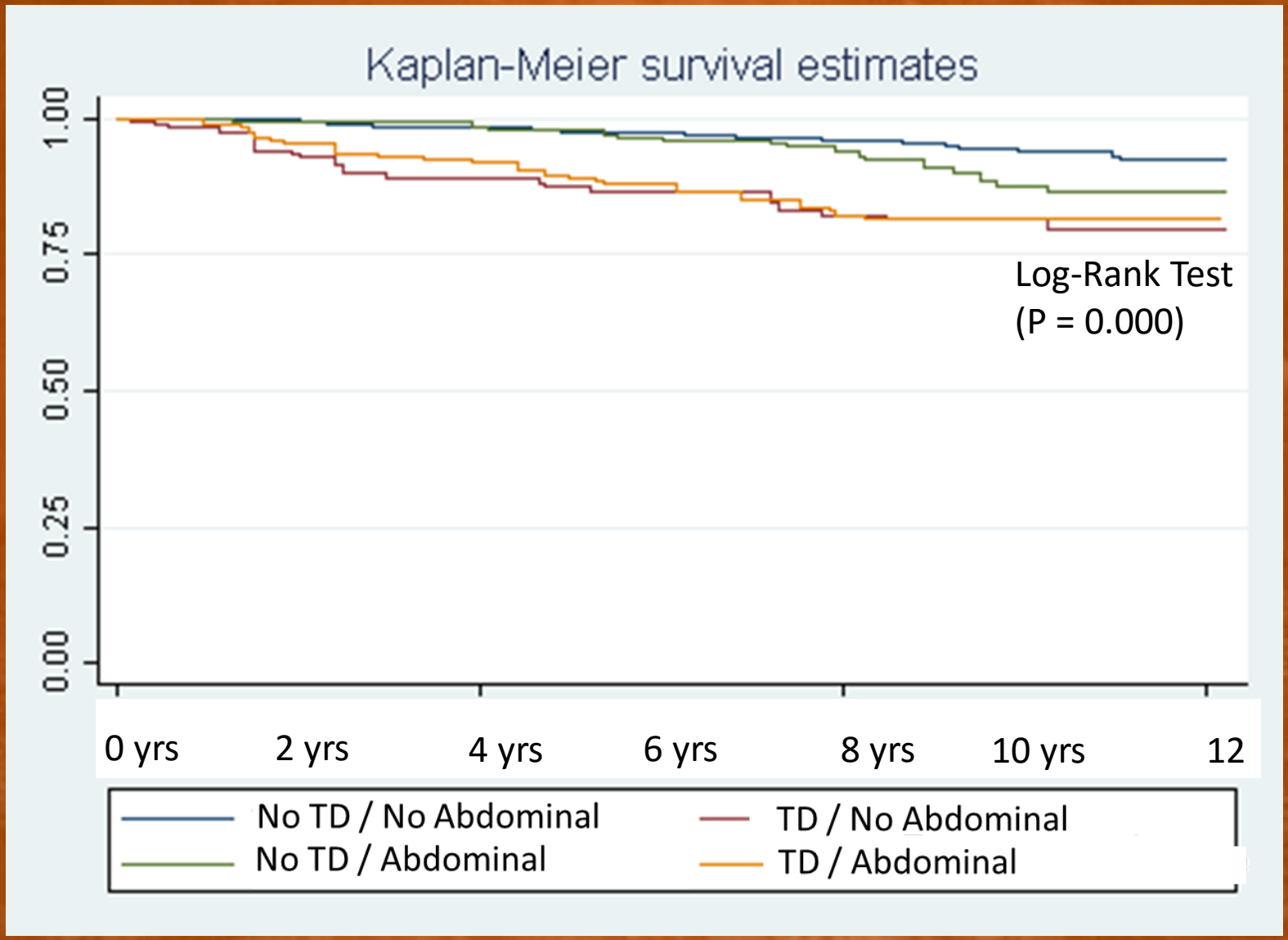
Testosterone Deficiency (TD, total testosterone ≤ 300 ng/dL), Overall Obesity (BMI ≥ 30 kg/m²), and Abdominal Obesity (WC ≥ 102 cm)



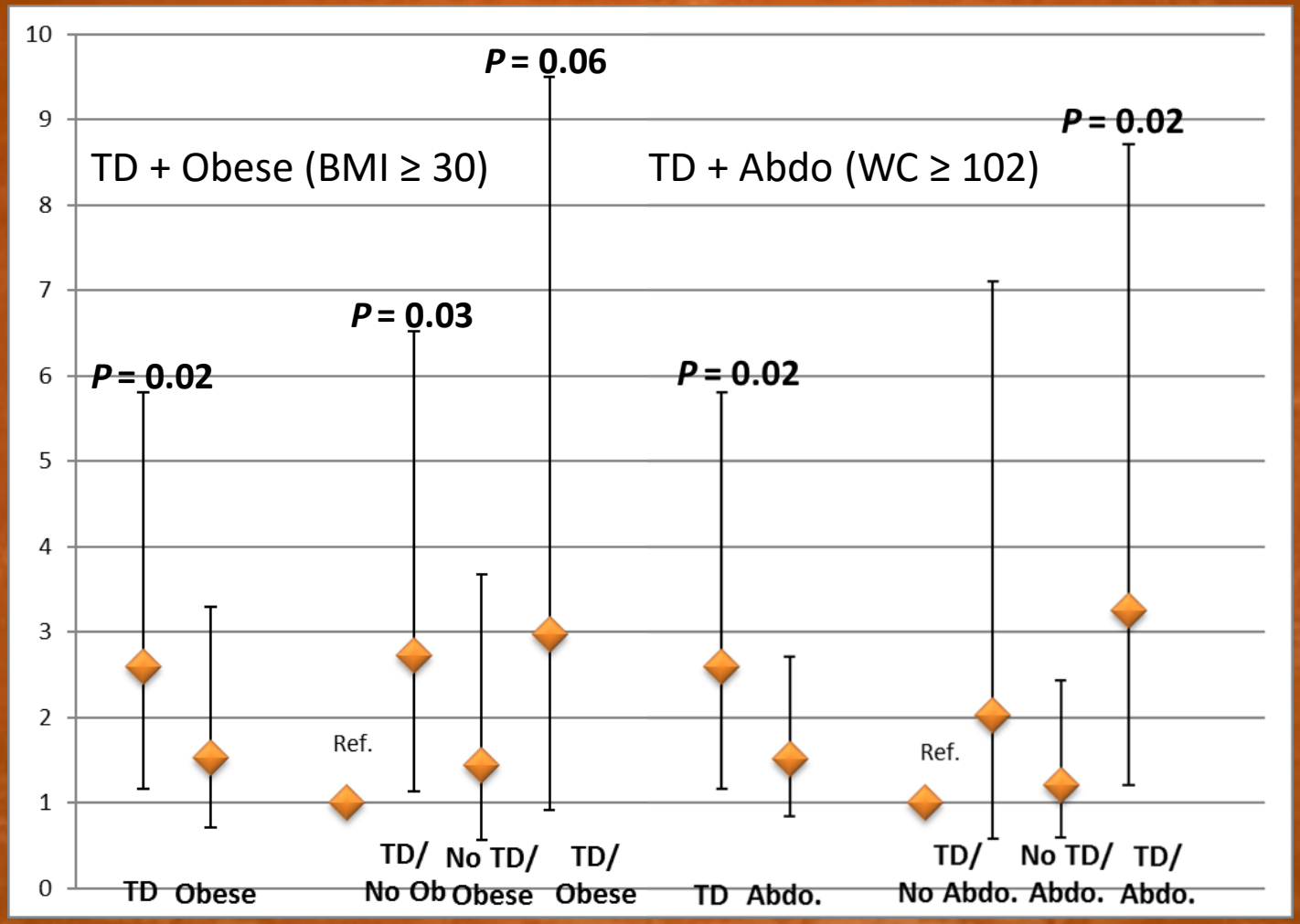
Testosterone Deficiency (TD, total testosterone ≤ 300 ng/dL) and Overall Obesity (BMI ≥ 30 kg/m²)



Testosterone Deficiency (TD, total testosterone ≤ 300 ng/dL) and Abdominal Obesity (WC ≥ 102 cm)

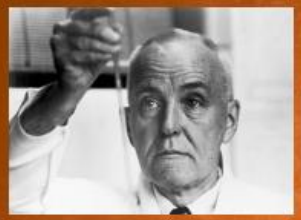


Association of the co-occurrence of testosterone deficiency and obesity with increase risk of death in US men



Adjusted for SHBG, estradiol, age, race/ethnicity, smoking status, alcohol consumption and physical activity

Testosterone & Prostate Cancer



Charles Huggins

Circa 1941

Studies on Prostatic Cancer

I. The Effect of Castration, of Estrogen and of Androgen Injection on Serum Phosphatases in Metastatic Carcinoma of the Prostate*

Charles Huggins, M.D., and Clarence V. Hodges, M.D.

Huggins C. et al. Cancer Res. 1941;1: 293

- Castration decreased acid phosphatase in men with metastatic PCa
- Testosterone administration raised acid phosphatase
- "Cancer of the prostate is activated by testosterone injections."
- Huggins awarded Nobel Prize 1966

Low Testosterone

- **Raising testosterone causes rapid PCa growth-**
  -High levels of testosterone or taking testosterone therapy is "Like feeding a hungry tumor" or "pouring gasoline on a fire."

Review Article

Transl Androl Urol 2016;5(6):898-908

Testosterone replacement therapy and the heart: friend, foe or bystander?

David S. Lopez[1,2], Steven Canfield[2], Run Wang[2]

[1]Department of Epidemiology, Human Genetics and Environmental Sciences, The University of Texas Health Science Center, School of Public Heal
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Endogenous and Exogenous Testosterone and Prostate Cancer: Increased, Decreased or Null Effects

Authors: David S. Lopez, Konstantinos K. Tsilidis, Run Wang, Steven Canfield

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Contributions: (II) Conception and design: All authors; (II) Administrative support: None; (III) Provision of study materials or patients: None; (IV) Collection and assembly of data: DS Lopez; (V) Data analysis and interpretation: All authors; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

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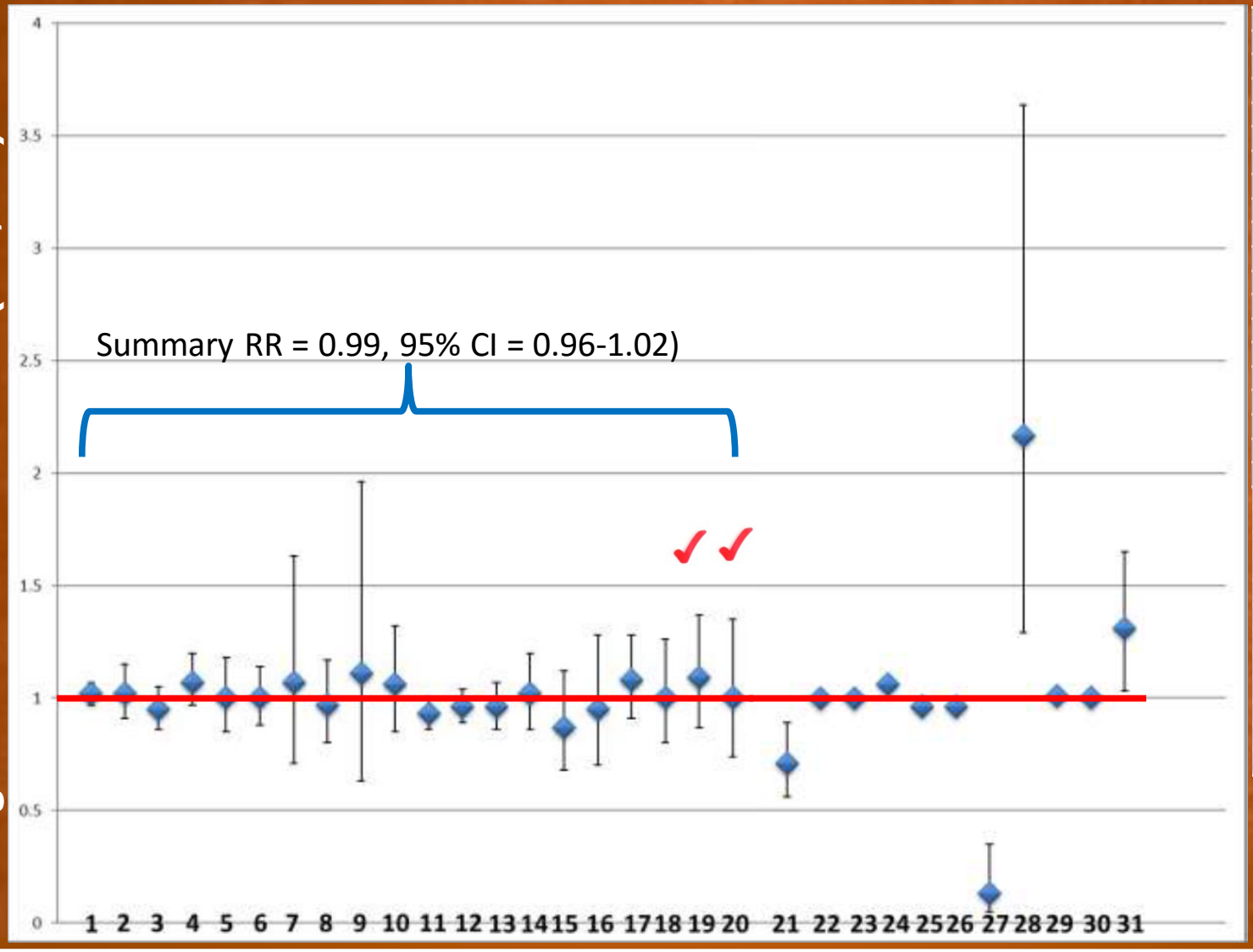
- Measures of association (OR, RR, HR's) from multivariable analyses
- Endogenous *(continuous and categorical)* and exogenous testosterone

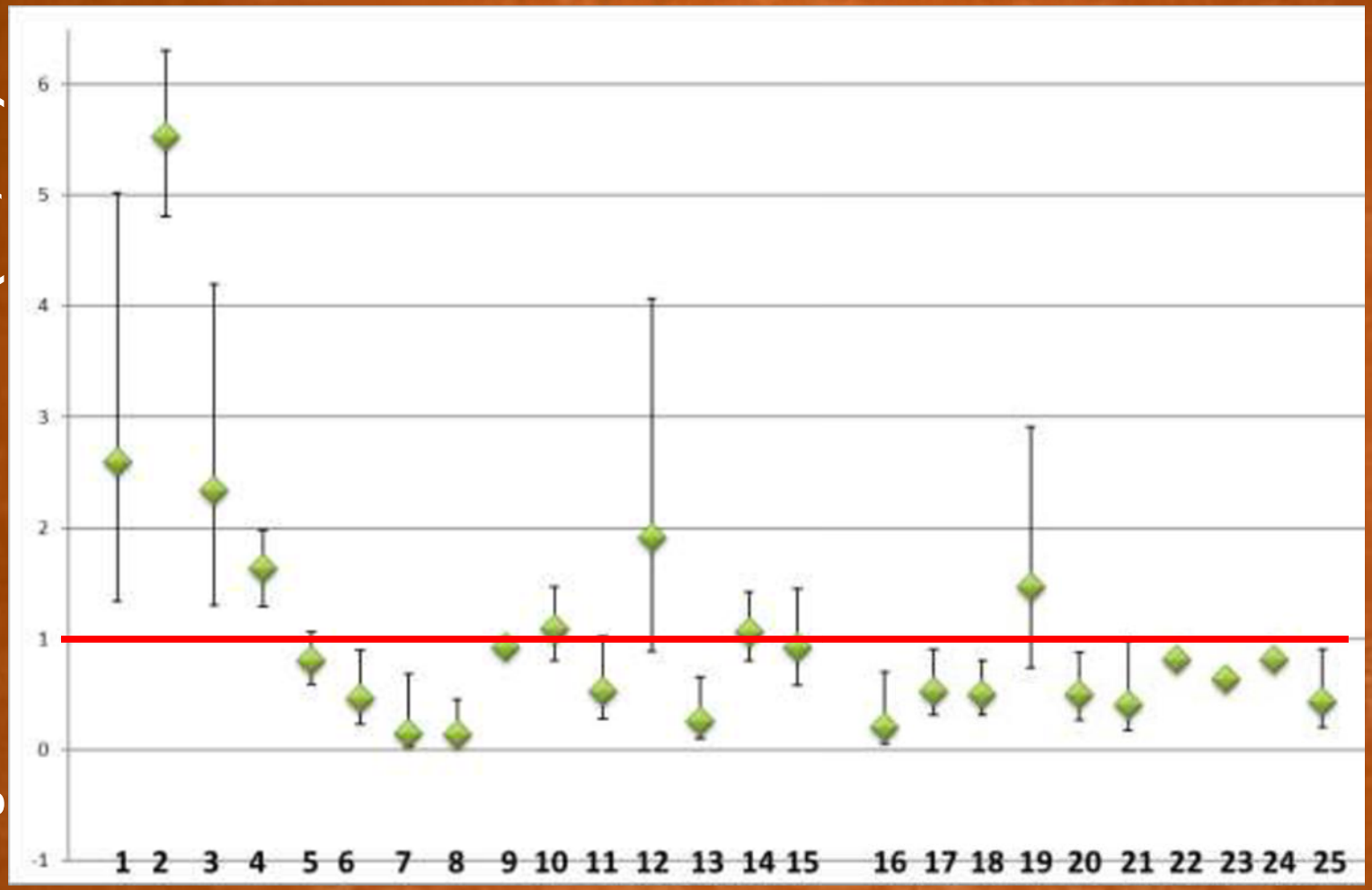
Review Article
Endogenous Testosterone(*continuous*) & PCa



Review Article

Endogenous Testosterone(*categorical*) & PCa

Comparing High vs Low levels of Testosterone

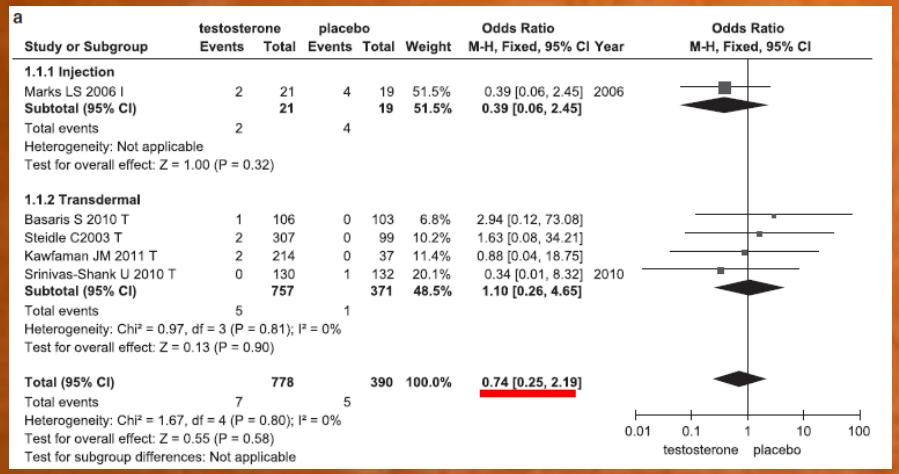


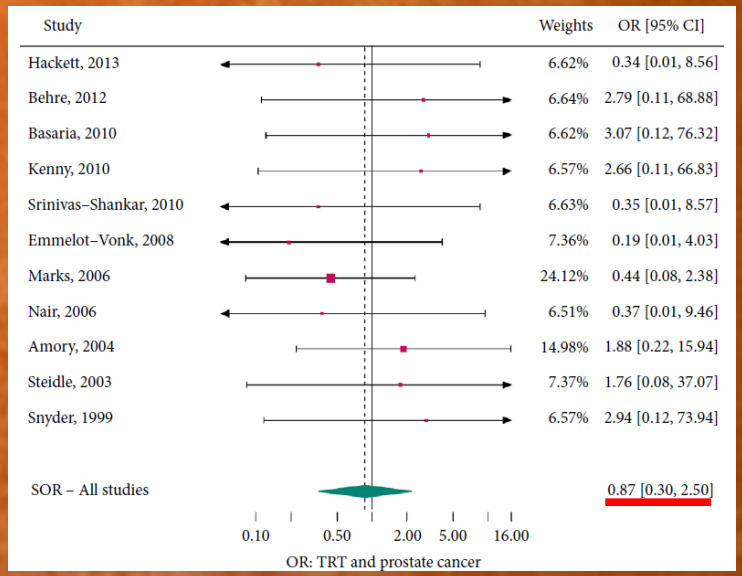
1	Gann 1996
2	Porcaro 2014
3	Shaneyfelt 2000
4	Salonia 2012
5	Stattin et al. 2004
6	Imamoto et al. 2001
7	Mearini 2008
8	Mearini 2013
9	Ahmadi 2011
10	Severi 2006 (Incident PCa)
11	Severi 2006 (Aggressive PCa)
12	Platz 2005 (Low-Grade)
13	Platz 2005 (High-Grade)
14	Muller 2012 (Gleason 2-6)
15	Muller 2012 (Gleason 7-10)
16	Kim 2012‡
17	Botto 2011‡
18	Shin 2010‡ (Incident Pca)
19	Shin 2010‡ (High-Grade Pca)
20	Morgentaler & Rhoden 2006‡
21	Lane 2008‡
22	Salonia 2011‡ (ECE)
23	Salonia 2011‡ (SVI)
24	Salonia 2011‡ (HGPCa)
25	Isom-Batz 2005‡

Testosterone Therapy & PCa (randomized controlled trials)

Table 3. Meta-analyses of randomized controlled trials (RCT's) that investigated the effect of TTh on PCa events (stage and grade). Only included studies that conducted multivariable analyses and reported magnitude of association (Odds Ratio, Relative Risk, etc.).

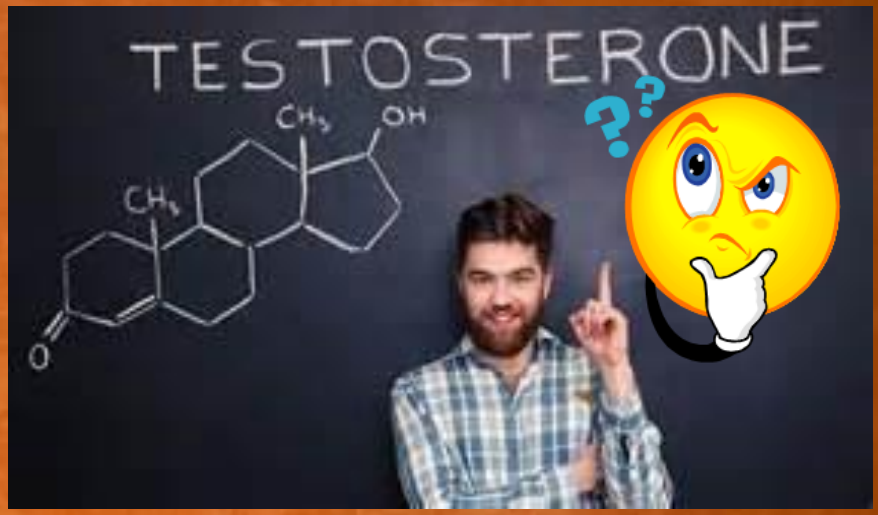
Study author and year	Study design	Number of studies / trials	Number of participants (n=)	TTh (n=) / Placebo (n=)	Prostate cancer: total, grade and/or stage (N=)	Results: only fully-adjusted multivariable models	Statistically significant (SS- $P < 0.05$) or not significant (NS)
Cui et al. 2014	Randomized controlled trials- Short term (<12 months)	5	1,168	778 / 390	Incident prostate cancer, n = 12	Summary OR = 0.74; 95% CI = 0.25-4.65	NS
	Randomized controlled trials- Long term (12-36 months)	3	379	191 / 188	Incident prostate cancer, n = 6	Summary OR = 0.99; 95% CI = 0.24-4.02	NS
Boyle et al. 2016	Randomized controlled trials (most of the trials < 12 months)	11	2,013	1,114 / 899	Incident prostate cancer, n = 20	Summary OR = 0.87; 95% CI = 0.30-2.5	NS





Another Moment to Think

- **Not proposing the use of testosterone therapy**
- **Not proposing to increase the levels of testosterone in men with prostate cancer**

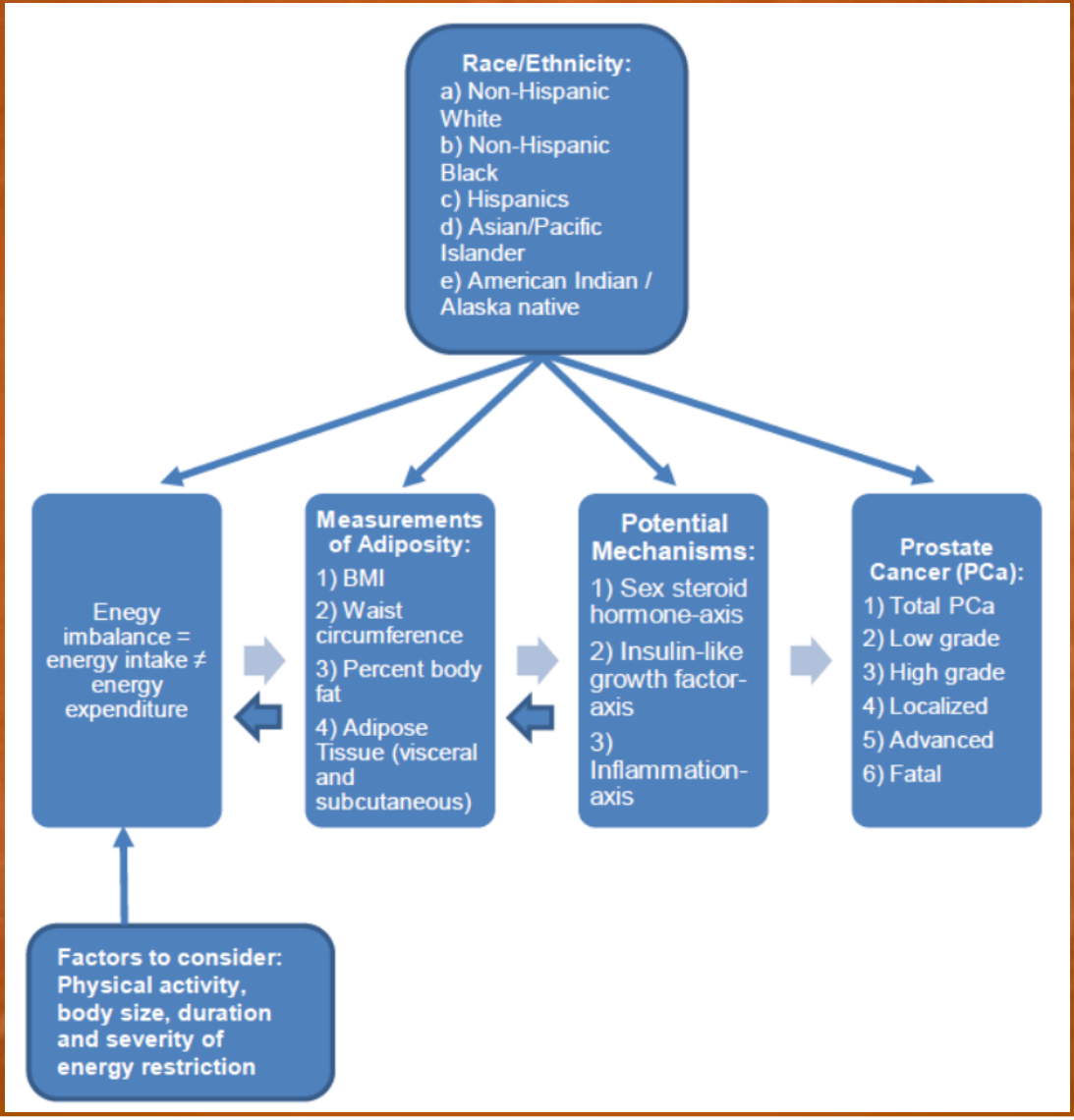


HOWEVER,

- **I want to appreciate the body of literature that negates the the contention that "high levels of testosterone increases prostate cancer."**

Research in Progress

(Prostate Cancer, Testosterone, Diet, and Weight Management)

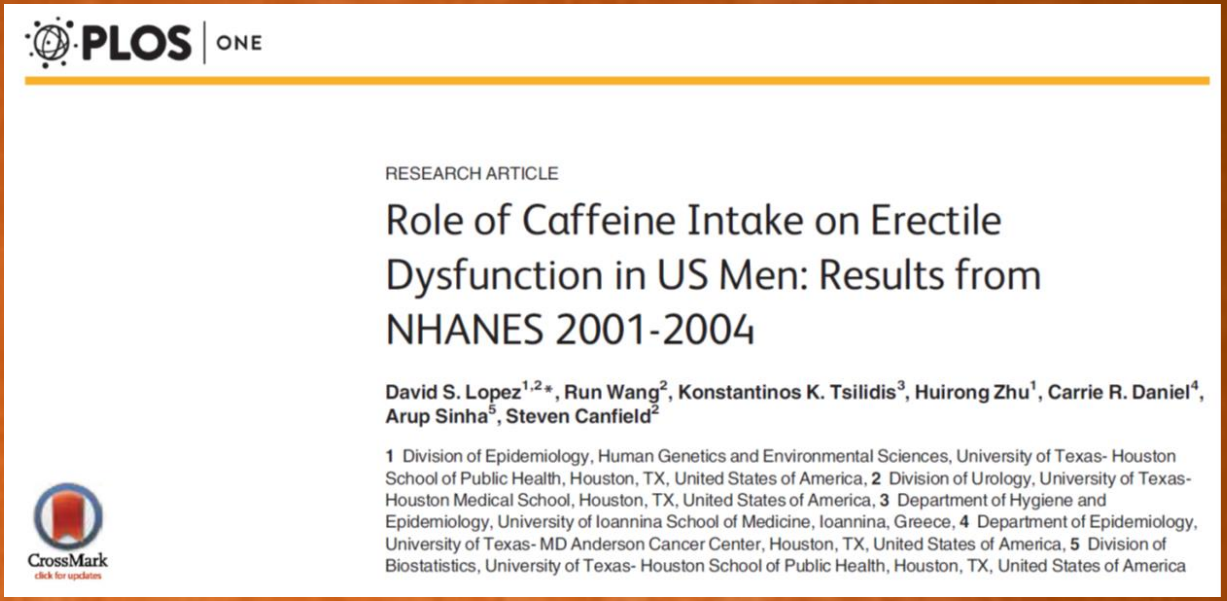


Research in Progress
(Prostate Cancer and SSB's)

- International consortium of 15 cohort studies from North America, Europe, Australia and Asia.
- 52, 683 primary incident PCa cases, including 4,924 advanced cases among 842, 149 men
- Proposing to investigate SSB's and PCa

Research in Progress

- We received pilot funding ($20,000) to investigate the prospective association between caffeine intake and ED



PLOS ONE

RESEARCH ARTICLE

Role of Caffeine Intake on Erectile Dysfunction in US Men: Results from NHANES 2001-2004

David S. Lopez[1,2]*, Run Wang[2], Konstantinos K. Tsilidis[3], Huirong Zhu[1], Carrie R. Daniel[4], Arup Sinha[5], Steven Canfield[2]

1 Division of Epidemiology, Human Genetics and Environmental Sciences, University of Texas- Houston School of Public Health, Houston, TX, United States of America, 2 Division of Urology, University of Texas-Houston Medical School, Houston, TX, United States of America, 3 Department of Hygiene and Epidemiology, University of Ioannina School of Medicine, Ioannina, Greece, 4 Department of Epidemiology, University of Texas- MD Anderson Cancer Center, Houston, TX, United States of America, 5 Division of Biostatistics, University of Texas- Houston School of Public Health, Houston, TX, United States of America

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HEALTH PROFESSIONALS FOLLOW-UP STUDY

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Researchers are using data collected by the Health Professionals Follow-up Study to determine what factors contribute to long-term health.

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is now online. Click here to continue to the 2014 HPFS questionnaire website. Prefer a hard copy? The 2014 questionnaire will be mailed in March.

Latest News & Publications

Coffee May Reduce Risk of Lethal Prostate Cancer in Men

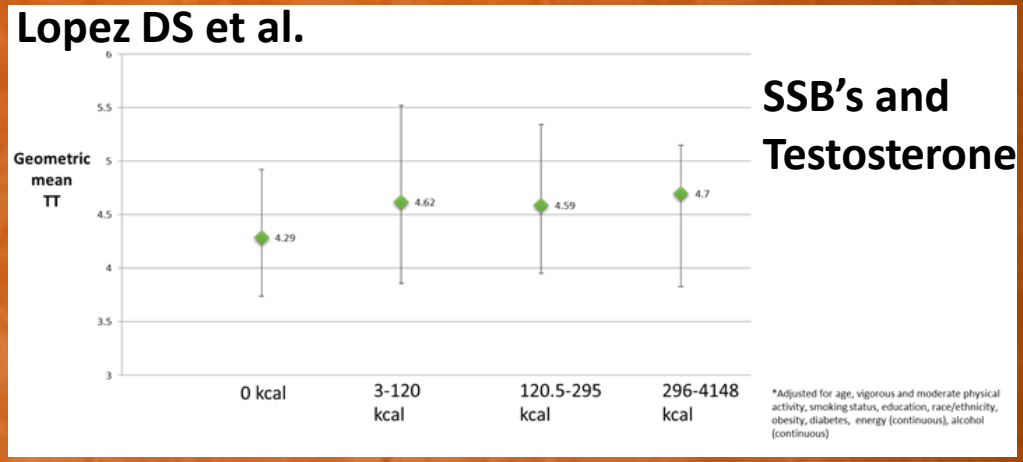
Read the press release.

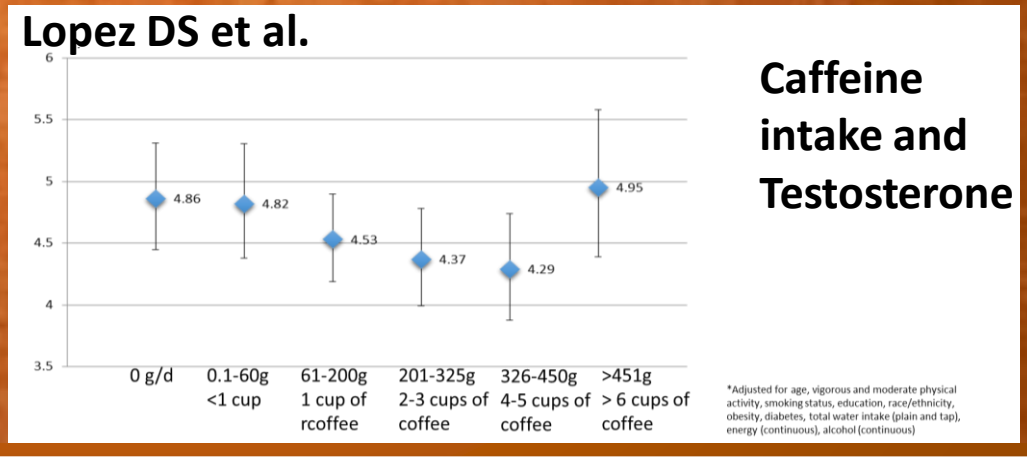
2011 HPFS Newsletter

Research in Progress

(Testosterone, diet, physical activity and weight management)

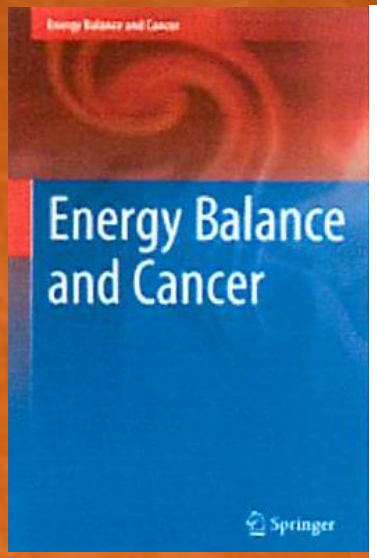
- Currently, investigating the relationship of SSB's and Caffeine intake with testosterone levels.
- We received pilot funding ($20,000) to conduct a comprehensive analyses between diet, physical activity and weight management and testosterone levels.





Next Steps and Future Directions

- "Racial/Ethnic Differences in the Association between Energy Balance and Prostate Cancer."
- Remain undetermined the interplay between measurement of adiposity, testosterone and advanced/fatal PCa
- We need randomized controlled trials to investigate relationship between diet, physical activity, weight management and PCa



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Berger/Platz Prostate Cancer Proposal (Volume 13)

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Introduction and Preface - Energy Balance and Prostate Cancer

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