

# Men: How to Be at the Top of Your Game

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## What are your performance goals?

- Improve brain/cognitive function
- Improve strength or endurance
- Increase muscle mass
- Decrease fat mass
- Improve sexual performance
- Have more energy
- Increase resilience to stress
- Boost overall sense of wellbeing



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## Key Element of Optimal Performance:

Optimal Testosterone Level



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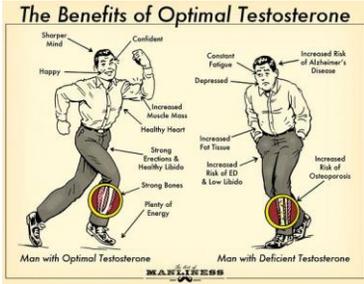
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### What is testosterone?

- Male sex hormone
- Mainly produced by the testicles
- Responsible for male sexual and reproductive development
- Women also produce testosterone, but in much smaller amounts
- Testosterone is also important for:
  - Good health
  - Disease prevention
  - Optimal performance

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### The Decline in Testosterone Levels

- Progressively declines with age, starting in late 20s to early 30s
- Generational decline in recent decades
  - The average man your age today has lower testosterone than the average man your age 30 years ago.

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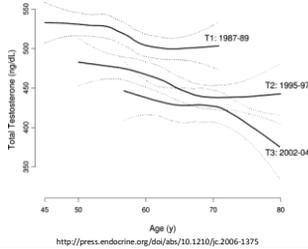
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### Generational decline in testosterone levels



<http://press.endocrine.org/doi/abs/10.1210/jc.2006-1375>  
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### What we'll cover today

1. Why your testosterone level is less than optimal
  2. Diet and lifestyle strategies to naturally improve testosterone levels
- What we won't discuss:
    - Taking testosterone/steroids
    - Increasing testosterone beyond normal, healthy levels
    - Treating testosterone deficiency



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### What's a normal, healthy testosterone level?

- Normal range for testosterone is huge
  - 348 to 1197 ng/dL (LabCorp reference range for adult men)
- Being "normal" doesn't tell you much.
- Performance will be impaired on the lower end of this range.
- Optimal level will vary by age and have individual variability.
- Testing is not necessary but can be useful. Ask your doctor.



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## Why your testosterone level is less than optimal...



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### Reason #1: You're overweight

- Excess body fat:
  1. Lowers testosterone production
  2. Increases conversion of testosterone into estrogen



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### How to get rid of excess body fat

1. Follow the recommendations in the rest of this presentation
2. Check out resources available through IU:
  - Weight Talk: Visit [weighttalk.net/iu](http://weighttalk.net/iu) to register
  - Diabetes Prevention Program: Visit [healthy.iu.edu](http://healthy.iu.edu) for more information
  - Nutrition Counseling: Email [askanrd@indiana.edu](mailto:askanrd@indiana.edu) to schedule



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## Reason #2: You have high inflammation

- Inflammation is an immune response to a stressor
- Causes of inflammation:
  - Injury
  - Illness
  - Unhealthy diet or lifestyle
- When inflammation is high:
  - Increased immune response
  - Decreased testosterone production
- Chronic inflammation associated with:
  - Low muscle mass
  - Impaired brain function



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## Foods that help reduce inflammation

- Polyphenols
  - Whole plant foods: vegetables, fruits, whole grains, nuts, beans, seeds
  - Herbs and spices: turmeric, garlic, cinnamon, oregano, rosemary, etc.
  - Others: tea, coffee, dark chocolate, red wine, extra virgin olive oil
- Omega-3 fats
  - Seafood: Consume at least 8 ounces per week
  - Fatty fish are best sources (salmon, tuna, sardines, mackerel)



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## Foods that increase inflammation

- Highly processed foods
  - Added sugars
  - Refined grains
  - Refined oils
- Excessive sugar intake significantly reduces testosterone
  - Study: After two cans of soda (75 g sugar) → 25% reduction in testosterone
  - 10 out of 74 men went from normal range to clinically deficient levels



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### Steer your diet away from inflammation

- Choose anti-inflammatory alternatives
  - Fruits in place of sweets
  - Whole grains over refined grains
  - Extra virgin olive oil in place of vegetable oils
- Monounsaturated fat intake associated with higher testosterone
  - Olive oil
  - Avocados
  - Nuts and seeds



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### Time-Restricted Eating

- Time-Restricted Eating
  - Restricting your daily eating period to a smaller window of time.
- Method
  - Eat breakfast every day
  - Finish eating within a 12 hour window (12 hour overnight fast)
  - Example: Breakfast at 7am. Finish eating by 7pm.
- Benefits
  - Anti-inflammatory effects
  - Weight loss effects
  - Testosterone benefit



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### Reason #3: Lack of Zn and Mg in your diet

- Zinc (Zn)
  - RDA: 11 mg
  - Oysters: 10-30 mg per ounce
  - Other sources: Meat, shellfish, beans, nuts
  - Animal sources are better absorbed than plant sources
- Magnesium (Mg)
  - Benefits: Physical performance, relaxation, sleep, anti-inflammatory effects
  - RDA: 420 mg
  - Sources: Leafy greens, nuts, seeds, beans, whole grains, fish



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## Food Sources of Zinc

Food	Zinc (RDA = 11 mg)
Oysters (2.5 oz)	25-75 mg
Beef (2.5 oz)	4-8 mg
Pork (2.5 oz)	2-4 mg
Scallops, clams, mussels (2.5 oz)	2 mg
Nuts and seeds (1 oz)	1-2 mg
Beans, cooked (3/4 cup)	1-2 mg
Chicken (2.5 oz)	1-2 mg



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## Canned Oysters

• Convenient and economical way to include oysters in your diet.

• Options:

- Smoked
- Boiled

• Uses:

- Soups
- Casseroles
- Sauces
- Stir fries
- On a cracker



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## Food Sources of Magnesium

Food	Magnesium (RDA = 420 mg)
Spinach, cooked (1/2 cup)	80 mg
Fish (2.5 oz)	60-90 mg
Beans, cooked (3/4 cup)	60-90 mg
Nuts and seeds (1 oz)	50-90 mg
Quinoa, cooked (1/2 cup)	50 mg
Brown rice, cooked (1/2 cup)	40 mg



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## Zn and Mg supplements

- Food sources are always the best option.
- I don't recommend taking zinc supplements:
  - Excess zinc supplementation can cause imbalance with copper
  - Zinc and copper are naturally balanced in food sources
- Magnesium supplementation is quite safe (but check w/ doctor first)
  - Daily dose of 200-300 mg can help ensure adequate intake
  - Choose -ate form (glycinate, citrate, malate) over -ide form (oxide, chloride)
  - Can help with sleep if taken before bed



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## Reason #4: You have poor sleep

- Poor sleep → lower testosterone → Worse sleep
- Our bodies regenerate testosterone while we sleep
  - Why levels are highest in the morning and decrease throughout the day
- Sleep is also important for:
  - Limiting inflammation
  - Metabolism and weight regulation
- Study
  - Men restricted to sleeping five hours per night for one week
  - Average reduction in testosterone level of 15%



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## Ways to improve your sleep

- Quantity
  - Get 7-9 hours of sleep per night
- Quality
  - Limit exposure to artificial light before bed and throughout night
- Consistency
  - Try to keep same bedtime and wake times every night
- For more information on improving sleep
  - Watch "Reset Your Rhythm" presentation at [healthy.iu.edu](http://healthy.iu.edu)



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### Reason #5: Your estrogen level is too high

- Estrogen is important for men, but excessive levels can cause:
  - Mood disturbances
  - Fatigue
  - Weight gain
  - Gynecomastia (enlarged breasts)
  - Low sex drive
  - Erectile dysfunction
- Normal range for estrogen (estradiol) is also huge:
  - 7.6 to 42.6 pg/mL (LabCorp reference range for adult men)



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### Causes of high estrogen in men

1. Excessive conversion of testosterone into estrogen
2. Excessive exposure to xenoestrogens
  - Xenoestrogens are compounds that have estrogen-like effects in the body



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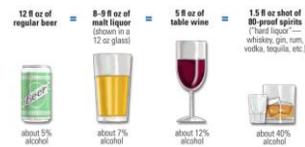
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### Why you're making too much E from T

- Causes of excessive conversion of T to E:
  - Excess body fat
  - Excessive alcohol intake (more than two drinks per day)



<http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/standard-drink>



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### Foods that can help reduce estrogen



- Mushrooms
  - Contain compounds that block conversion of T to E
  - White button mushrooms are one of the most effective options
- Cruciferous vegetables
  - Broccoli, cabbage, Brussels sprouts, cauliflower, kale, etc.
  - Contain indole-3-carbinol
    - Converts estrogen from stronger to weaker form
- Both foods also have powerful anti-inflammatory benefits!



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### Xenoestrogens

- Compounds that have estrogen effects in the body
- Often found in:
  - Plastics
  - Personal care products
  - Pesticides
- Can be absorbed through:
  - Digestive tract
  - Skin
  - Respiratory tract



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### Xenoestrogens in Plastics

- Avoid plastic food/beverage containers when possible
  - Bisphenol A (BPA)
  - Bisphenol S (BPS)
- Do not expose plastic containers to heat
  - Do not cook in plastic
  - Do not store in hot vehicles



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## Xenoestrogens in Personal Care Items

- Personal care items
  - Phthalates
    - "Fragrance"- cologne, shampoos, detergent, air fresheners, etc.
  - Parabens
    - Lotions, shampoos, shaving gels, etc.
    - Forms: Methyl-, ethyl-, propyl-, butyl-
- Tips
  - Read the ingredients list and avoid "Fragrance" and "-paraben"
  - Choose fragrance-free options
  - Use essential oils as fragrance alternatives



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## One more xenoestrogen...

- Perfluorinated compounds (PFCs)
  - Found in non-stick cookware
  - Associated with decreased testosterone levels



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### Reason #6: You have a sedentary lifestyle

- Two components to this problem
  1. Lack of movement
  2. Lack of time outdoors
- Be physically active outside!



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### How being outdoors affects testosterone

- Vitamin D
  - About 40% of Americans are deficient
  - Sun exposure is best source of vitamin D



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### Vitamin D and Testosterone

- Research shows vitamin D levels correlate with testosterone
  - Higher vitamin D = Higher testosterone
- Vitamin D supplementation may increase testosterone levels
  - One study found 25% increase in testosterone
  - Another study found no significant effect
- Ultraviolet (UV) light shown to significantly increase testosterone
- Sunlight is better option than supplements



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## Seasonal rhythm of testosterone

- Seasonal pattern of UV light from the sun
  - Highest in summer
  - Lowest in winter
- Testosterone & Vitamin D
  - Levels highest in summer and early autumn
  - Levels lowest in winter and early spring



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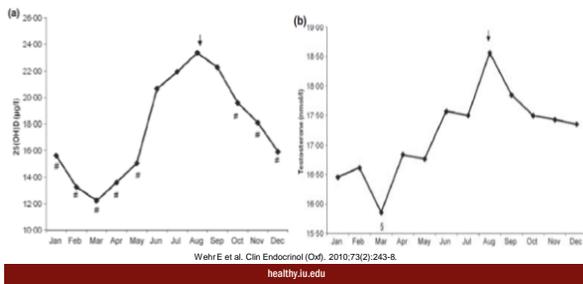
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## Sun exposure recommendations

- The dose makes the poison
  - Excessive sun exposure can increase risk of cancer
  - Inadequate sun exposure can also increase risk of cancer
- Factors that influence vitamin D production from sunlight
  - Time of year
  - Time of day
  - Duration of exposure
  - Amount of skin exposed
  - Skin tone
  - Age



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## Physical activity

- Any type is better than none
- Some forms of exercise are more effective at raising testosterone
  - Most effective: Shorter duration, higher intensity
  - Moderately effective: Longer duration, moderate intensity
  - Not at all effective: Sitting on the couch
- Types of short duration, high intensity activities
  1. Lifting weights
  2. High intensity interval training (HIIT)



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## Lifting weights

- In nature:
  - Lift/carry heavy rocks or logs
- In the gym:
  - Do compound movement lifts: Bench press, squats, deadlift
  - Proper form is key! Work with a personal trainer if new to lifting.



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## High Intensity Interval Training (HIIT)

- Multiple short bouts of intense activity with rest periods in between
- Can be done with many forms of exercise
  - Running, cycling, elliptical machine, walking, etc.



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## Exercise Recommendations

- Consult with your physician before starting new exercise program.
- Work with a personal trainer if new to exercise.
- Always warm up before any exercises.
- Rest and recovery is critical. Overtraining can cause:
  - Decreased testosterone
  - Increased risk of injury and illness
  - Decreased physical performance
  - Altered mood
  - Fatigue



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## Timing of exercise

- Afternoon or evening workouts cause greater increase in testosterone than morning workouts
- The stress hormone cortisol is also highest in the morning
  - Working out in the morning causes further increase in cortisol
  - Excess cortisol can inhibit muscle growth and recovery
- You may see greater performance gains from exercising in the afternoon/evening than in the morning.



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## Reason #7: You're stressed out

- Stress relates back to cortisol
- Excess cortisol decreases testosterone production
- Symptoms of excess stress and cortisol
  - Fatigue
  - Irritability
  - Decreased sex drive
  - Depression
  - Poor cognitive function
  - Difficulty sleeping



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### Cortisol influences the effects of testosterone

- Dominance: A confident and self-assured behavior style.
  - Testosterone level alone does not predict dominance.
  - Cortisol levels influence the behavioral effects of testosterone.



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### Study #1: Dominance in Leaders

- “Leader” assigned to verbally direct “follower” to complete a task of arranging blocks in specific patterns.
- Leaders were observed and assessed using a scale to measure dominant traits:
  - Engaged, energetic, confident, comfortable, assertive, etc.
- Testosterone and cortisol measured prior to completing task.



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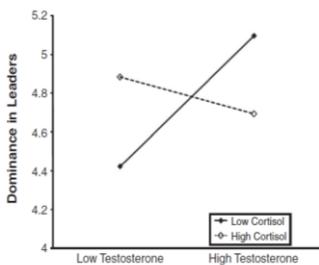
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PK, Mehta, R.A. Josephs / Hormones and Behavior 58 (2010) 898–906



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## Study #2: Effects of Social Defeat

- Participants were paired to compete against each other in solving a series of number-based puzzles.
- Game was rigged:
  - One person was given easy puzzles
  - Other person was given difficult puzzles
- After competition, participants were given option of:
  1. Compete again against same participant
  2. Complete a questionnaire on food and entertainment preferences
- Testosterone and cortisol levels measured before and after.



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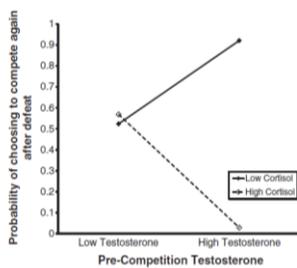
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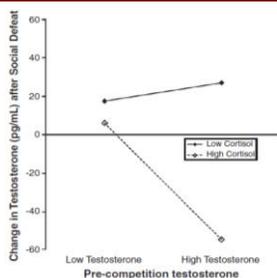
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### What does this mean?

- Managing stress and avoiding excessive cortisol production are crucial to getting the most benefit from testosterone.



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### How to better manage stress

- Things we already discussed that can help:
  - Anti-inflammatory diet
  - Getting enough sleep
  - Regular physical activity
  - Spending time outdoors



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### How to better manage stress

- Things we haven't yet discussed:
  - Meditation (check out Mindful Way to Stress Reduction at [healthy.iu.edu](http://healthy.iu.edu))
  - Laughter
  - Social connections
  - Listening to music
  - Massage therapy\*
  - Aromatherapy\*
  - Biofeedback\*

\*Available at Health & Wellness at the IMU on Bloomington campus



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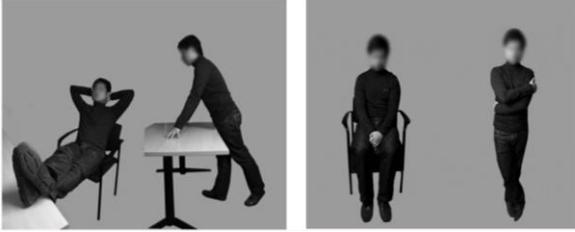
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### High-Power vs Low-Power Poses



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### Power poses

- Holding high-power poses for two minutes:
  - Increased testosterone by 19%
  - Decreased cortisol by 25%
- Holding low-power poses for two minutes:
  - Decreased testosterone by 10%
  - Increased cortisol by 17%
- Behavior was also influenced by poses
  - High-power poses → More confident and self-assured
- "Fake it till you make it"



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### Let's practice...



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## Summary

- Better testosterone = better performance
- All aspects of your life have an impact.
  - Diet and exercise
  - Sleep and stress management
  - Environment
- Programs and resources
  - Visit [healthy.iu.edu](http://healthy.iu.edu)
- For nutrition counseling or additional questions
  - Email [askanrd@indiana.edu](mailto:askanrd@indiana.edu)



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## Questions?



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