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

Key Element of Optimal Performance:

Optimal Testosterone Level
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

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.
Generational decline in testosterone levels

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

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

Reason #1: You’re overweight

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

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 to register
   - Diabetes Prevention Program: Visit healthy.iu.edu for more information
   - Nutrition Counseling: Email askrd@indiana.edu to schedule
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

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)

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
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

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

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
Food Sources of Zinc

<table>
<thead>
<tr>
<th>Food</th>
<th>Zinc (RDA = 11 mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oysters (2.5 oz)</td>
<td>25.75 mg</td>
</tr>
<tr>
<td>Beef (2.5 oz)</td>
<td>4.4 mg</td>
</tr>
<tr>
<td>Pork (2.5 oz)</td>
<td>2.4 mg</td>
</tr>
<tr>
<td>Scallops, clams, mussels (2.5 oz)</td>
<td>2 mg</td>
</tr>
<tr>
<td>Nuts and seeds (1 oz)</td>
<td>1.2 mg</td>
</tr>
<tr>
<td>Beans, cooked (3/4 cup)</td>
<td>1.2 mg</td>
</tr>
<tr>
<td>Chicken (2.5 oz)</td>
<td>1.2 mg</td>
</tr>
</tbody>
</table>

Canned Oysters

- Convenient and economical way to include oysters in your diet.
- Options:
  - Smoked
  - Boiled
- Uses:
  - Soups
  - Casseroles
  - Sauces
  - Stir fries
  - On a cracker

Food Sources of Magnesium

<table>
<thead>
<tr>
<th>Food</th>
<th>Magnesium (RDA = 420 mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinach, cooked (1/2 cup)</td>
<td>80 mg</td>
</tr>
<tr>
<td>Fish (2.5 oz)</td>
<td>60-90 mg</td>
</tr>
<tr>
<td>Beans, cooked (1/4 cup)</td>
<td>60-90 mg</td>
</tr>
<tr>
<td>Nuts and seeds (1 oz)</td>
<td>50-90 mg</td>
</tr>
<tr>
<td>Quinoa, cooked (1/2 cup)</td>
<td>50 mg</td>
</tr>
<tr>
<td>Brown rice, cooked (1/2 cup)</td>
<td>40 mg</td>
</tr>
</tbody>
</table>
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

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%

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
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)

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

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)
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!

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

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
Xenoestrogens in Personal Care Items

- Personal care items
  - Phthalates
  - "Fragrance"—cologne, shampoos, detergent, air fresheners, etc.
  - Parabens
    - "Fragrance"—cologne, 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

One more xenoestrogen...

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

How being outdoors affects testosterone

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

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
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


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
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)

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.

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.
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

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.

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
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.

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.
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.
What does this mean?

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

How to better manage stress

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

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

*Available at Health & Wellness at the IMU on Bloomington campus
High-Power vs Low-Power Poses

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”

Let’s practice...
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
• For nutrition counseling or additional questions
  • Email askand@indiana.edu

References


References (cont.)

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Questions?