

***Sports and Doping...  
what can we learn?  
Can we help our patients?***

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***#1453***

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The most important thing in the Olympic Games is not to win but to take part, just as the most important thing in life is not the triumph but the struggle.

The essential thing is not to have conquered but to have fought well.

*(The Olympic Creed)*

# Conflicts....

➤ *Book –*

*Pharmacology, Doping and Sports*

➤ *Board member -*

*U.S. Antidoping Agency*



## *What are the risks?*

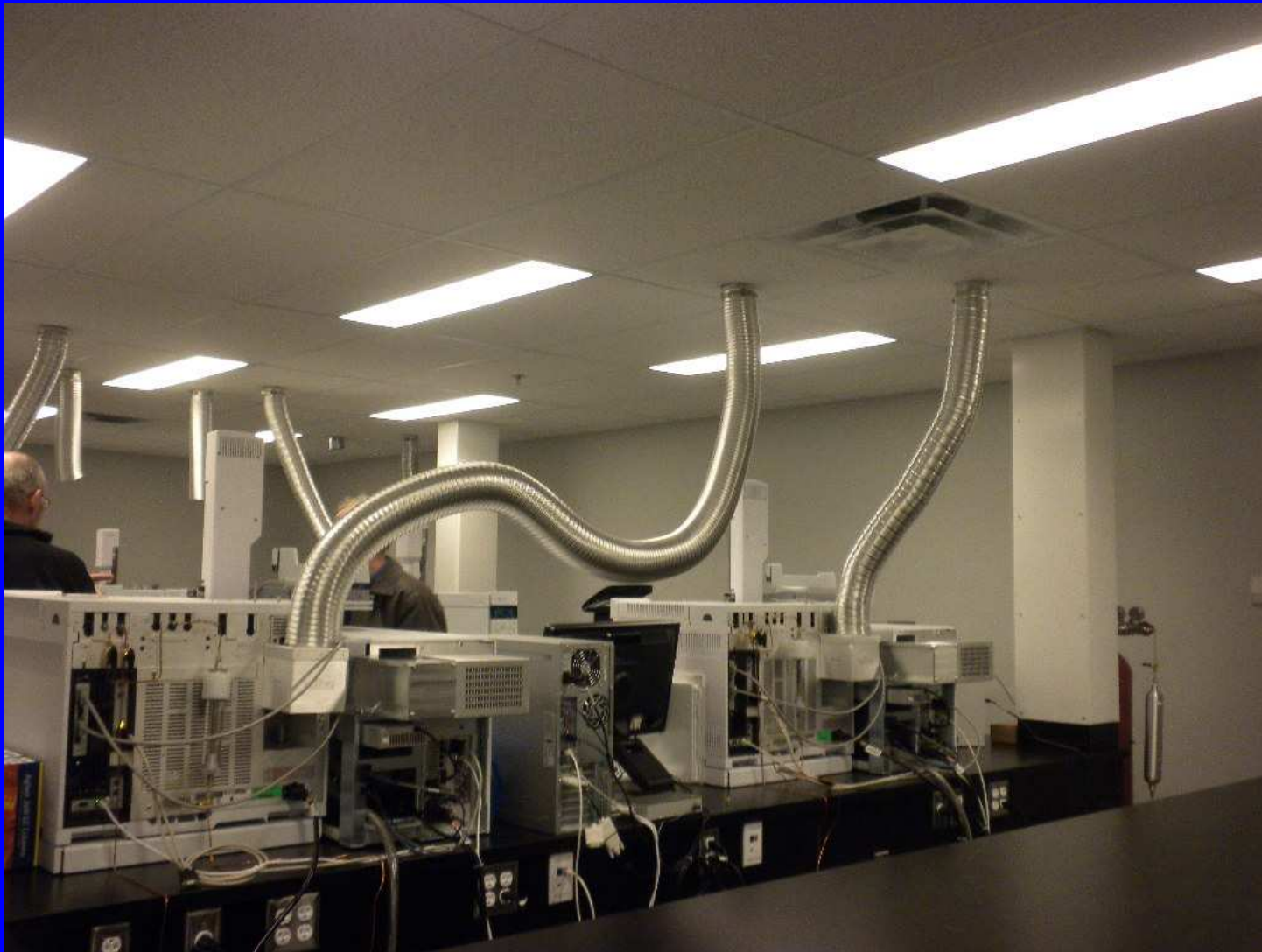
- **The prevalence of chronic overuse injuries in diving in the scientific literature ranges from 39% to 100%.**
- **The risk for injury increases with increasing level of skill and the higher degree of difficulty of dives.**



**Fourcroy**



**Fourcroy**



**Fourcroy**



- The first ancient Olympic Games can be traced back to 776 BC. dedicated to the Olympian gods and staged on the ancient plains of Olympia – this continued for nearly 12 centuries.
- The prize a simple Wild Olive Branch and a ribbon to festoon their heads.



Doping is defined as the administration of, or use by competing athletes of, any substances foreign to the body or of any physiological substance taken in abnormal quantity or taken by an abnormal route of entry into the body with the sole intention of increasing in an artificial and unfair manner his or her performance in competition. Performance enhancement includes recovery, improved focus, concentration, and alteration of the perception of fatigue.

## *What are the issues?*

- Every physician should be aware of the health risks for both male and female athletes.
- The female athlete triad is a combination of three interrelated conditions that are associated with athletic training: disordered eating, amenorrhea and osteoporosis.
- The performance-enhancing doping compounds also have health consequences.

## *What are the issues?*

- Athletes are particularly vulnerable.
- Easy prey for the quack and the charlatan, or even for those who with the best of intentions advocate some new-found, but unproven, approach or therapy.
- Sport, and associated training and performance pressures, may reveal or exacerbate existing tendencies in certain athletes

## *What are the issues?*

- Appropriate attention should be paid to injury prevention and the creation of practice and competition environments that are safe.
- Athletes need advocates: individuals who will act in an athlete's best interests while appreciating their unique aspirations; individuals who understand that their first responsibility is to safeguard the athlete's health and well-being.

## *A Little History*

- 1960: GDR was a relatively obscure country with a cold war image and great plans.
- 1974 : European athletic championships in Rome there was analyses of urine samples for androgenic steroids- but no positive results were published.
- 1996 Atlanta – screened by gas chromatography coupled to high resolution mass spectrometry.
- 2000: Erythropoietin first used
- *USADA began in 2000 October 1*



*Br J Urol 78:691-698, 1996*

# *USADA Research*

- Premised on peer reviewed publication
- Scientific scrutiny
- Reproducibility.
  - See web site for announcement
  - [www.usantidoping.org](http://www.usantidoping.org)

# *Erythropoietin (hR EPO)*

- Erythropoietin is a regulator allowing release of premature cells from bone marrow
  - Blood test based on on-off markers partly as result of release of immature retics and progenitor cell types detected in circulation.
  - Urine test - truncated peptides.
- Increases oxygenation of tissues and forbidden by IOC - cyclists and....
- Urine (French) and blood (Aus) were first tested in Sydney – 2000

# *Growth Hormones (GH)*

- **First abused prior to 1985 with pituitary extract tissue.**
- **Development of recombinant GH changed the safety and availability picture.**



# *Gene Doping*

- **Genetically modified athletes.....**
  - **Possibilities**
    - **Muscle genes**
    - **Mitochondria**

# *Prevalence*

- Female athletes - high prevalence of stress urinary incontinence.
- Is that only in eating disordered athletes?
- How prevalent is the female triad?

*Bo. Med Sci Sports Exercise 2001*

*Caylet et al, 2006 CJU*

*Hobart JA, and Smucker DR. June 1,2000,*

*(American Family Physician*

# *A continuing problem*

➤ Many teens abusing medications

*Kuehn BM. JAMA. 2007*