

Activity 4.4.3: Performance Enhancers (Optional)

Introduction

During the Olympics or other elite sporting events, competitors test the limits of human strength, speed and agility. These athletes spend hours in the gym, building muscle and enhancing their cardiovascular fitness. Many athletes train for years, hoping to make it to the top of their sport. The pressure to perform is often overwhelming. Looking for an edge and fearing falling behind the competition, some athletes up their training and alter their diet, while others turn to more controversial, often illegal and dangerous performance enhancers to “level the playing field.” While these drugs may have positive effects on performance, they inflict serious long term and short term damage on the human body. These drugs or treatments damage the health and the reputation of the athlete, as well as the integrity of the sport.

Despite repeated scandals, performance enhancing drugs and treatments still are being used. In 1999, the World Anti-Doping Agency (WADA) was created to monitor the use of performance enhancing drugs, screen athletes for the use of banned substances and protect the integrity of athletic competition. Their mission is to encourage athletes around the globe to “play true” and to refrain from the use of artificial enhancements.

In this activity, you will research a performance-enhancing drug or treatment and investigate how this drug is supposed to improve athletic performance. As you think about how this drug interacts with the systems of the body, you will also explore the risk this drug or treatment imposes on overall health. As a class, you will convene a meeting of the WADA and decide which supplements or drugs should be banned from athletic competition.

Equipment

* Computer with Internet access
* Activity 4.4.3 Student Response Sheet
* Laboratory journal

Procedure

1. You have been asked to be a part of the World Anti-Doping Agency summit on performance enhancers. You will explore the way in which these supplements work, assess health risks and decide whether or not each substance should be banned from use in athletic competitions.
2. With a partner, research drugs, supplements or treatments said to enhance athletic performance:
* Creatine
* Anabolic steroids
* Beta-blockers
* Erythropoietin (EPO)
* Human growth hormone (hGH)
* Stimulants (ephedrine)
* Diuretics
* Caffeine
* Blood Doping
* Human chorionic gonadotropin (hCG)
* Glutamine
* Androstenedione (Andro)
1. Take notes on your graphic organizer as you answer the following questions about your assigned enhancer.
* What is this drug, supplement or treatment?
* Why do some athletes choose to use this enhancer? How does this treatment alter the body in a way that enhances athletic performance? List and describe the body systems that are affected.
* What are the short and long term health risks associated with this enhancer? Describe the damage to human body systems.
1. View the current WADA Prohibited List found at <http://www.wada-ama.org/rtecontent/document/2008_List_En.pdf>. Explore the wide range of performance enhancing drugs that are banned in competition. Discuss any differences between the class list and the actual WADA list.

Conclusion

1. Describe how two of the performance enhancers you discussed in the summit affect human body systems. Be sure to include both positive effects and negative effects.
2. Some performance enhancers are only banned in specific sports. Why do you think beta-blockers are banned in sports such as archery or gymnastics?
3. Unfortunately, it is not just athletes who are turning to these types of treatments. Many young men and woman, unhappy with their bodies, may turn to drugs in the hopes of added muscle mass, increased size or a leaner body. Why do you think students your age might consider using these drugs and what would you say to those who are considering it?
4. “Gene doping” has recently been added to the WADA prohibited list. What do you think this term means?
5. Finnish cross-country skier Eero Mantyranta won two gold medals in the 1964 Winter Olympics. It was not until decades later that scientists identified a genetic mutation in Eero’s family that causes an excessive response to EPO. How do you think this “natural advantage” contributed to Eero’s success in endurance sports?
6. Describe at least two other genetic changes (either natural or through genetic enhancement) that might improve the performance of an athlete. Make sure to explain how the gene change is linked to increased chances for success.
7. Throughout this course, we have been looking at medical interventions as a means to preserve and better life as we know it. Explain how performance enhancers show another side of medical interventions.