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A COMPARATIVE EXAMINATION OF ILLICIT DOPING PRACTICES IN BASEBALL

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ABSTRACT

Performance-enhancing drugs (PEDs) present a considerable problem to any sporting organization. The desire to be the best drives many of the world's best athletes. Sometimes this pursuit encourages risk-taking with PEDs. It is the responsibility of Major League Baseball to develop an effective system that both teaches its players about the impact of PED use, but also be powerful enough to dissuade PED use through testing and enforcement. Bay Area Laboratory Co-operative (BALCO) and Biogenesis present two recent examples from different testing periods where drug-testing protocols changed markedly, largely in respect to the Mitchell Report. Both instances share important commonalities, particularly the role of intermediaries, disreputable trainers and nutritionists, and investigative journalists that helped reveal the depth of the PED abuse. These similarities may help drive Major League Baseball's drug testing programs in the right direction. Steps such as encouraging third-party investigation outside of traditional testing programs, incorporation of a full-scale stockroom and nutritional education within the organization and more rigorous application of current World Anti-Doping Agency testing procedures can begin an effective dissociation from baseball's darkest age.

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Chapter 1

Introduction

Performance-enhancing drugs (PEDs) have played an integral part in the development of American sports. Players who utilized PEDs were often praised for their ability to achieve extraordinary feats. Hall of Famer Pud Galvin is cited as the first baseball player to have doped in 1889 (Smith, 2006). A pitcher for a number of clubs, Galvin reportedly used Brown-Séquad elixir, a solution containing monkey testosterone, prior to a game. Newspapers not only knew about his actions, but praised Galvin for his discovery and his play. This sort of overt doping is unheard of in the modern age, and while animal testicles are not explicitly expressed on Major League Baseball's (MLB) Prohibited Substance List, their purported active ingredients are now found on the list.

Major League Baseball's Prohibited Substance List

Major League Baseball's prohibited substance list is divided into four categories: Drugs of Abuse, Performance Enhancing Substances, Stimulants, and Dehydroepiandrosterone (DHEA). The latter three categories are PEDs. This section will summarize each of the categories.

Category A: Drugs of Abuse. Drugs of Abuse contains substances that are often referred to as recreational drugs such as natural cannabinoids, opiates and cocaine. Generally, items

found in this category are illegal under federal, local, and/or local ordinances, not just in baseball.

Category B: Performance Enhancing Substances. MLB's second class of performance enhancing substances refers to any type of exogenous substance that is absorbed into the body, through either injection, topical cream or pill, administered with the intent of bolstering one's abilities. It includes anabolic steroids, forms of testosterone and human growth hormone (hGH).

Androgen treatment preceded androgen abuse in sport. Steroid experimentation began as early as 1848 when a German scientist named Berthold conducted an experiment in which he implanted rooster testes into castrated roosters and observed that these new implants resulted in male anatomical structures and behaviors after several months (Taylor, 1991). Another form of this experiment came 50 years later when French scientist Charles-Édouard Brown-Séquard removed testicles from dogs and guinea pigs. He then created a salt solution from the samples and injected it into his own body. He claimed later that the "stew" made him more energetic and even boosted his strength (Taylor, 1991). The scientific community criticized this wild tactic, but it may have been unfair to dispel his work so quickly as it foreshadowed the development of contemporary hormone replacement therapies.

In the United States, Squibb Pharmaceuticals funded research at the University of Chicago by Professor Fred C. Koch and Lemuel C. McGee to isolate and purify the male sex hormone. Like the previous experiments, they implanted testicular extract from a bull into a capon. The "bull-capons" began exhibiting male characteristics, confirming the male sex hormone (McGee, 1927). This development ignited a search for ways to synthesize the male sex hormone due to its potential applications in public health, military and competitive sport. The first usage of steroids in a competitive environment is inconclusive, but a 1944 study in which

six men were treated with methyltestosterone over a three-to-six week period is suspected as the first to have studied its effects. The results cited “enhancement of central nervous system reflex time, back strength muscle enhancements and increase in dynamic and static work performance” (Taylor, 1991).

As technology has progressed, scientists have found that various changes to the testosterone compound can result in potential new anabolic substances.

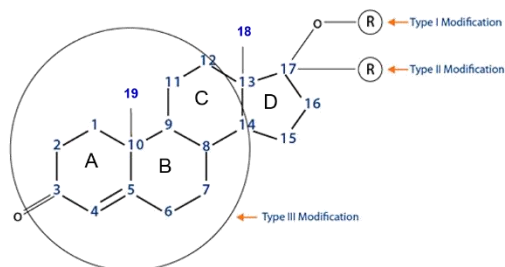


Figure 1. Testosterone and its sites of modification.

Testosterone has three primary sites available for modification. The first is an esterification of the 17β -hydroxy position. Type I modifications decrease polarity, thus increasing the solubility of the substance making it more effective for slow-release injections. Longer chains have an extended half-life in the body increasing their bioavailability. Type II modification is a 17α -alkylation. Alkylation at this site results in an orally active anabolic steroid that bypasses hepatic metabolism. Type III modifications occur at the ring structure carbons 4 and 5. A reduction at this site yields compounds with shorter half-life and increases androgenic activity (Srinivas-Shankar and Wu, 2006).

Also included in the Performance Enhancing Substances list is hGH. hGH, also known as somatotropin, is a peptide hormone that enhances body size and length. It is not directly involved in the skeletal maturation process, but does play a role in osteogenesis (Li, 1991). In medicine, hGH plays an important role in boosting hypoactive pituitary function. It has been purported that

hGH is capable of sculpting mass muscle and cutting fat simultaneously (Li, 1991). The hormone activates IGF-1 (Insulin-like Growth Factor 1) which in turn stimulates mTOR (mammalian target of rapamycin) to increase cell proliferation. hGH advocates claim its ability to build mass, but also maintain it during recovery from intense bouts of exercise (Li, 1991).

Category C: Stimulants. Stimulants are drugs designed to improve levels of mental and physical energy by stimulating the central nervous systems. This class of drugs contains substances such as nicotine and caffeine, but moderate use of products containing them is harmless. This distinction excludes them from being on banned substance lists across sports. The prominent stimulant in athletics is amphetamines.

World War II played an integral part in the doping landscape because of the extensive study of amphetamines during that span of years. Amphetamines were given to soldiers to increase work output and decrease the onset of fatigue. The combination was valuable for coping with the arduous conditions of war that are draining and redundant. Because many of the studies were performed during wartime, there was less of a concern about the harmful side effects and instead heralded the drug's "increased capacity to sustain a given level of performance," or emphasizing that there were few unfavorable signs at low dosages (Hellebrandt and Karpovich, 1941).

Former soldiers participated in athletics upon returning home and took amphetamines based on their experience with the drug during wartime (Hellebrandt and Karpovich, 1941). Its ability to boost performance grew its popularity and amphetamines spread throughout athletics. Amphetamine use in baseball is well-documented across the decades and only recently made it on the Prohibited Substance List in 2006 (MLB, 2016).

Category D: Dehydroepiandrosterone (DHEA). DHEA is a prohormone that is a precursor to testosterone and modifies body composition. DHEA is unique in that it is the only compound to have its own section in the list of banned substances. As we shall see, part of this inclusion is due to the evolution of the league's Collective Bargaining Agreement (CBA) with its players' union. DHEA was originally banned from over-the-counter sales by the Food and Drug Administration in 1985, but after Congress passed the Dietary Supplement Health and Education Act of 1994, which regulates many sports supplements as food, it was no longer under the FDA's jurisdiction as a drug and could be sold again. As a result, the league struggled with banning a substance that was not technically illegal (Kornblut and Wilson, 2005).

Chapter 2

History of Drug Testing in Major League Baseball

Baseball's history is riddled with players secretly, or even openly, using amphetamines and steroids and a significant contributor to the lax policy on the performance-enhancing drugs. Anabolic steroids were only added to the banned substances list in 1991 following the passage of the Anabolic Steroids Control Act in 1990 (ESPN.com, 2005). Then-commissioner Fay Vincent voiced that baseball echoed the country's sentiments and made it illegal to possess steroids:

The possession, sale or use of any illegal drug or controlled substance by Major League players and personnel is strictly prohibited. Major League players or personnel involved in the possession, sale or use of any illegal drug or controlled substance are subject to discipline by the Commissioner and risk permanent expulsion from the game...

This prohibition applies to all illegal drugs and controlled substances, including steroids or prescription drugs for which the individual in possession of the drug does not have a prescription.

While Vincent may have announced that the possession and use was illegal, there was no framework in place to determine if a player was using without getting caught in the act because there was no testing protocol in place. Baseball recognized that there was a problem so it implemented a drug testing program in the minor leagues, outside the restrictions binding it in the current CBA (collective bargaining agreement) with its players' union.

In 2001, the MLB tested players in affiliate minor league organizations for PEDs and drugs of abuse. Punishments for each subsequent failure were as follows:

First Offense	15-game ban
Second Offense	30-game ban
Third Offense	60-game ban
Fourth Offense	One-year ban
Fifth Offense	Lifetime ban

Figure 2 Major League Baseball's punishment system during 2001 Minor League Investigation.

Based on this disciplinary structure, it would require a player to fail a test on four different occasions before there arguably would be significant time missed (Major League Baseball (MLB, 2016). This structure is a testament to the weakness of the original policy and would lead to future modifications as the league worked out the severity of drug use in its sport.

Interestingly, it took congressional persuasion for baseball to integrate a drug testing policy into the majors. In June 2002, at a Senate Commerce Meeting in Washington, D.C., Senators Byron Dorgan and John McCain recommended to Major League Commissioner Bud Selig and MLB Players Association executive director Don Fehr that strict testing should be added to its upcoming CBA.

Two months later, MLB and the players' union agreed to "Major League Baseball's Joint Drug Prevention and Treatment Program as an addendum to the new Basic Agreement," that would begin as "Survey Testing" in 2003. This testing would include random testing of all 40 players on active rosters, but the results of tests would be anonymous and no punishments would be levied (MLB, 2016).

Over the following year, between 5 and 7 percent of the 1,438 tests were positive, spurring movement toward mandatory PED testing beginning in the upcoming season. The punishment for the first offense was placing the player under medical assistance and repeated testing. After presiding over its own tests for the first two years, MLB elected to send its samples to the World Anti-Doping Agency laboratories in Los Angeles and Montreal. Later in 2004, George Bush signed the Anabolic Steroid Control Act of 2004, adding more than 100 different testosterone and testosterone precursors to the banned substance list (Jenkins, 2004).

In light of the Bay Area Laboratory Cooperative (BALCO) trials of 2004 (to be discussed), during the winter meetings of 2005, owners and players agreed to a more stringent testing policy to establish more punitive measures for a failed test, effective for the 2006 season.

The modifications included:

First Offense	10-day suspension
Second Offense	30-day suspension
Third Offense	60-day suspension
Fourth Offense	One-year suspension

Figure 3 Adjustments to MLB's punishments following 2005 Winter Meetings and the BALCO trials.

The player's name would be released to the public on the first offense, and each of the suspensions would be without pay (MLB, 2016). While this was an improvement to the system, it was not nearly as punishing as it appears because it likely resulted in approximately 2/3 of games missed in that window, and for starting pitchers, is an even smaller percentage.

A revealing event in this "steroid era" of baseball was the release of Jose Canseco's book, "Juiced: Wild Times, Rampant 'Roids, Smash Hits, and How Baseball Got Big" in February 2005. The book chronicles his time in baseball and his involvement with steroids,

which included several prominent players of the time such as Mark McGwire. The story gained significant traction with the media, warranting an interview with *60 Minutes* on CBS and eventually leading to the calling of a congressional hearing in early March of that year. Executives, managers and players, former and current, were subpoenaed after their initial invitations to attend the hearing, but were subsequently declined. The hearings resulted in a major push for penalty reform across major American sports and the Olympics.

By November of 2005, a new CBA was tabled and was instead presented to the players' union to be enacted the following season. Not only was this agreement important to end the steroid era, but it included the first official banning of amphetamines in MLB. The new agreement spelled out an increase in testing as well as the punishment for positive steroid tests as follows:

First Offense	50-game ban
Second Offense	100-game ban
Third Offense	Permanent Ban

Figure 4 Modifications in November 2005 to MLB's punishment scales after pressure from Congress.

While awaiting ratification of the deal, Bud Selig said, "This has been a historic day in baseball, a very meaningful one. I believe this will eradicate steroid use in baseball" (Bloom, 2005.) The agreement was an important step in deflecting noticeable pressure from Congress. Ultimately, Selig would prove to be naïve in claiming it would remove steroids from baseball.

Despite addressing Congress's primary concerns, Representative Tom Davis of Virginia, felt that the organizations could have agreed to stricter terms. He advocated for multiple tests and a firmer punishment for the first offense, but conceded that the new agreement presented a roadmap to removing steroids from baseball.

Ever since the Committee began its investigation into steroid use in professional sports, I have expressed my desire to see the leagues and the players unions take action to combat the use of performance-enhancing drugs. The agreement reached between Major League Baseball and the players association is the type of self-initiated action we were hoping for all along.

I am a baseball fan. I always have been. There's been a cloud over the game I love. Because of our oversight, and because we've helped elevate public concern about this public health crisis, there's now a glimpse of sunlight (Bloom, 2006).

Davis' comments present a unique insight into the steroid issue, combining a political viewpoint with what the average, sport-consuming citizen would want in American sports. However, this optimism was clouded shortly after the release of a book highlighting PED abuse that warranted even more third-party involvement.

Impact of the Mitchell Report

In 2006, Lance Williams and Mark Fainaru-Wada, reporters for the *San Francisco Chronicle*, published *Game of Shadows: Barry Bonds, BALCO, and the Steroids Scandal that Rocked Professional Sports* (Fainaru-Wada and Williams, 2006). Their exposé detailed a five-year period in which Barry Bonds, while playing for the San Francisco Giants, allegedly received and used various forms of performance-enhancing drugs. The book prompted Commissioner Selig to hire former Senator George Mitchell to probe the contents of the book and the primary

offenders, the Bay Area Laboratory Co-Operative (BALCO) (Mitchell, 2007). The crux of the investigation will be examined in greater detail later, but it is important to note the Mitchell Report and its findings as a vital component in altering the league's view and policy on PED usage. MLB struggled with its education program and saw its preventative measures become less effective. The Mitchell Report gave the league traction to become focused on forcible punishment of its players.

The Mitchell Report was the culmination of a review over 100,000 pages of documents and approximately 700 interviews that described an inherent problem with PED use within Major League Baseball. Interestingly, in a section titled "The Problem is Serious," Mitchell mentions the integrity of the game only in the first sentence. While notable that he does address the integrity of the game, it is perhaps more important how he frames the argument in favor of protecting the players from harming their bodies, being swindled by drug dealers and preserving the paradigm of a wholesome role model for young ball players (Mitchell, 2007). The report said it was necessary to include the anecdote about children in hopes of reinforcing the ideal of a clean game and that it is not necessary to dope in order to succeed in the league.

Mitchell praised the MLB for its efforts to strengthen its program, but explained that it was behind and needed to evolve as time progressed to be comparable to protocols set by the Olympics through the World Anti-Doping Agency (WADA). He also outlined certain characteristics that make a formidable and effective program, as follows:

Independence of the program administrator; transparency and accountability; effective, year-round, unannounced testing; adherence to best practices as they develop; due process for athletes; adequate funding; and a robust education program (Mitchell, 2007).

It may seem clear now that these were logical progressions in any functioning agreement between a league and its players' union, but this gives a sense of how immature the realm of drug testing was at this stage. There was clear usage, by prominent, well-known players, yet the powers-to-be stumbled when presented with this obstacle.

Another interesting element of the Mitchell Report is that many of the players implicated in the investigation were being accused of using Human Growth Hormone (hGH) as their primary form of abuse. hGH was added to the MLB's banned substance list in 2005, and despite having no positive tests leading up to the report's publishing, was suspected to have pervasive use because the technology did not exist to detect traces of hGH in a player. Perhaps a microcosm of the sporting world, the abuse of hGH in a landscape where lack of detection lends one to believe that athletes will continue to push the limits on drug testing and infringe upon their fellow competitor's rights in order to gain an advantage. This troubling contention simply reinforces a need for continual modifications to MLB's testing protocols, and in all sports for that matter.

Beyond chronicling decades of PED abuse, the Mitchell Report is significant for its recommendations to Selig and the league in an attempt to end a dark era in baseball. Mitchell claimed that the best way to ameliorate illicit drug use in baseball was to focus on improving investigations in non-testing evidence, player education, and altering the testing program itself.

As illustrated by the hGH example, testing at the time was not capable of identifying cheaters. In order to circumvent this problem, Mitchell believed it was necessary to bolster the investigating power of the league by creating a Department of Investigation, which would report to the president of Major League Baseball.

Regarding player education, it was found that players were not convinced by the idea of health risks of steroids and other PEDs as a motivating reason to avoid them. As a result, experts in Mitchell's investigation suggested the importance of nutrition, training and utilization of legal and safe supplements as alternative methods to dissuade PED use.

For the testing protocol, Mitchell offered several steps to improving the current system. The first was to outsource the testing program to an independent party. He also added that the program should be transparent to the public and have year-round unannounced tests, but left discretion to the independent party on how to implement it.

Along with his personal sentiments, Mitchell left an interesting suggestion to the commissioner. He recommended that players start fresh to develop trust and understanding between the players, clubs, the league and its fans. Essentially, Mitchell stated that players who tested positive previously should not be retroactively punished. This amnesty provision would allow offenders to remain in the league even after they were caught knowingly taking PEDs. Controversial in its own right, the suggestion leaves suspicion about the integrity of the game, especially with proven cheaters actively participating in the sport.

In January 2013, six years after the release of the Mitchell report, Major League Baseball announced significant strides in its drug testing protocol after its winter meetings were held. The league would begin in-season hGH testing, as well as establish baseline blood levels and a longitudinal profile, a form of "biological passport," for all active players. Furthermore, the commissioner followed Mitchell's suggestion to work with a thirdparty, a move that would allow them to enhance the quality of the League's testing protocol using the available technology at the World Ant-Doping Agency-accredited laboratory at Laval University in Montreal. The longitudinal profile would be used to monitor Testosterone-to-Epitestosterone (T/E) ratio on a

year-round basis and allow suspicious samples to be further evaluated using Carbon Isotope Mass Spectrometry (IRMS) to predict the origin of excess testosterone.

The importance of the T/E ratio is that it can signal if a person is using PEDs by relating total testosterone concentration in urine to the degradation product (epitestosterone) of endogenous testosterone production. The average T/E level across the human population is variable, but following international convention, it was established that any ratio exceeding four would be considered a suspicious test.

Current Testing Procedures

After reviewing the history of modern day drug testing in the MLB, it is worth examining the current procedures and policies to understand how past developments led to the active system. As suggested following the Mitchell Report, drug testing has become a year-round affair. In-season testing begins at the opening of spring training and will result in over 3,200 randomized urine tests throughout the season. In addition to the urine tests, there are blood tests for each player to detect the presence of hGH. In the off-season, about 350 random urine tests, and 140 blood tests are administered. The protocol results in the testing of approximately one quarter of every MLB team's active 40-man roster outside of competitive play (MLB, 2015). Additionally, MLB has continued to use the WADA-accredited lab in Montreal to analyze these samples and compare them with the baseline values found in the longitudinal profile established when the player enters the league.

If a player is suspected of a positive test, the player is subjected to a bout of follow-up testing that includes six unannounced urine tests and three unannounced blood tests in the 12-

month period following the initial suspected positive. Players remain under this protocol as long as they are part of the 40-man roster, regardless of their status—active or on disabled list with injury.

Over the past decade, there were increased penalties for PEDs and other illegal drugs and they have culminated in the current structure, as seen below.

First Offense	80-game suspension
Second Offense	Season suspension; 183-day pay suspension
Third Offense	Permanent Suspension

Figure 5 Current punitive measures for substances under the Performance Enhancing Substance portion of the Prohibited Substance List.

These penalties are the most severe in the league’s history, as they should be. The punitive aspects of the early 2000s CBAs were relatively soft on players. It would have taken twice as many tests in 2002 to be suspended for the same amount of time as the current framework. It is worth noting that the permanent ban is not truly permanent as a player can appeal for reinstatement after two years.

The current program separates discipline for PEDs and other drugs, including stimulants and DHEA. These penalties are not nearly as strict, but still present an efficient means of punishing unwanted drug use in baseball.

First Offense	Follow-up Testing Protocol
Second Offense	25-game suspension
Third Offense	80-game suspension

Figure 6 Punishments for use of DHEA, Stimulants and Drugs of Abuse under the current MLB drug program.

These suspensions are much more common in MLB given the wide scope of drugs they cover. Exogenous supplementation with DHEA was banned in 2014. Amphetamine use also

falls under this punitive structure. Amphetamines, and stimulants in general, present a unique problem for baseball. Because of their ability to narrow one's focus (ADAA.org, 2010-2016), there was considerable abuse prior to the initial 2006 ban.

Appropriate medical use of these drugs is permitted, provided that a player files a therapeutic-use exemptions (TEU). A TEU is essentially written permission from a medical professional for a player to consume a given substance. However, there is suspicion that players use TEUs as loopholes to work around the bans on PEDs, especially stimulants. For example, in 2015, 113 TEUs were filed with the league. Of the 113, 111 were for medications concerning Attention Deficit Disorder (Perez, 2015). That number accounts for approximately 9 percent of the league. That is substantially higher than the number of individuals with ADD in the average population, which hovers around 4% (ADAA.org, 2010-2016). While these figures do not provide explicit proof of cheating, it is alarming that there is twice the number of ADD diagnoses in a sample of elite baseball players compared to the general population.

World Anti-Doping Agency's Effect on MLB

Because baseball has been subject of intense media scrutiny for its drug policies, it has the most developed testing program across major American sports. Football and basketball have not been attacked in the same way baseball has, and their respective policies reflect that in their simplicity.

Of all the testing protocols in sport, the system run by the World Anti-Doping Agency, which oversees Olympic athletes and other national sporting bodies, is considered to be the premier model in sports. One of the strengths of the program is its randomness. Athletes can be

subjected to a test at any time out of competition. The athlete is then monitored by the tester until the sample is collected, allowing no leeway to avoid or forge sample collection. In-competition, individuals are to submit samples following an event and medalists are all but guaranteed to be tested.

Like MLB and other major sports, WADA relies on blood samples to test for hGH. WADA was a driving influence in the addition of hGH testing to North American sports and allows the leagues to evaluate samples at WADA-accredited labs. hGH testing began at the international level on a research basis at the 2004 Summer Olympics in Greece with the Isoform Differential Immunoassays (Isoform Test) before becoming fully applied two years later at the Winter Olympics in Turin. The Isoform Test measures the proportion of natural occurring forms of hGH in comparison to potential recombinant hGH that is injected into the body. MLB adopted this strategy as they incorporated hGH monitoring to their drug testing protocols (WADA, 2016b). This test, now accepted universally, has been validated by a Court of Arbitration of Sport in 2013, certified by two independent teams of statisticians, and reviewed and confirmed by IGF and growth hormone specialists.

WADA has also developed a second test that works complementarily to the Isoform Test called the hGH Biomarkers test, or the “markers approach.” The test was unveiled at the 2012 Summer Olympics in London, but the assay manufacturer withdrew the product and there are current studies being done to validate a new assay. WADA’s laboratories and researchers are also working to establish Decision Limits (DLs) for the hGH Biomarkers test before reintroducing the test to the regular protocol (WADA, 2016b). What makes the markers approach unique is that it seeks to identify various proteins, specifically IGF-I and N-terminal

peptide of procollagen (P-III-NP). These two proteins are used to establish and changes to the hGH/IGF-I ratio and any hGH stimulating agents.

The most advanced effective means of testing developed by WADA has been the biological passports. WADA has both a Haematological Module and a Steroidal Module to monitor its athletes. The Haemtological Module is designed to track changes in blood samples from ergogenic aids such as blood transfusion. Of the two WADA tests, the MLB uses the Steroidal Module, which analyzes urine samples over time. Starting in 2004, the module relied on the T/E ratio to determine whether players were potentially using steroids. If a sample's T/E ratio exceed 4:1, then the sample underwent IRMS testing. However, in 2013, WADA converted from the "population reference" to a more individual approach, monitoring changes specific to the athlete in urine samples (WADA, 2016a).

What held back MLB's drug-testing program?

One of the primary issues with getting drug testing into MLB was the resistance faced in collective bargaining with the players' union. In 1968, executive director of the Major League Baseball's Players Association (MLBPA) Marvin Miller worked with the players to create the league's first CBA. Through the CBA, the MLBPA established basic labor rights such as minimum salary and arbitration. In 1971, MLB commissioner Bowie Kuhn sought to establish a drug policy for the league that had players follow federal and state laws. However, the MLBPA refused to agree to a drug-testing program. Thirteen years later, new commissioner Peter Ueberroth attempted to establish a program, but encountered resistance from the union again. For a single season, players and the league agreed to a system where players could ask for help and

would receive treatment and punishment, but the voluntary basis of the program was ineffective and the program was soon disbanded (Weber, 2013).

Over the next decade, there was rampant drug use in the league. One of the most prominent examples was presented in the 1985 Pittsburgh drug trials. Players were given immunity from criminal prosecution for their testimony on the state of drugs in the MLB. Keith Hernandez, National League MVP in 1979, stated that he and approximately 40% of other players in the league were regular users of cocaine (Baseball Reference, 2016). The trials prompted Ueberroth to suspend 11 players and pursue another joint drug program. Again, the MLBPA rejected the proposal because it believed that agreeing to the program implied that the players were guilty of use. Ueberroth attempted to circumvent the CBA by having players include a clause in their contracts that would subject them to random drug testing, but an arbitrator found that in violation of the CBA and that activity ceased immediately (Weber, 2013).

As a result, from 1985 to 2002, there was no drug-testing program in MLB, and players were effectively free to dope. It was only when players began to speak openly about PEDs that the calls for a testing program became deafening. As mentioned previously, MLB first instituted a testing program in the minors because it was not under restrictions of the CBA. The first few years of testing acted like a pilot study. The league was tentative in punishing its players, and really only attempted to gauge how bad the PED problem actually was in the modern age. PED was found to be prevalent, with 5-7% of tests coming up positive and the protocols modified to adjust for the number of players doping. However, the punitive aspects of the program were weak.

Part of any drug-testing program is the element of conflict of interest. MLB is dependent upon the players to present a product to its fans. Punishments for positive drug tests results in

suspensions for players and a tarnished reputation for the brand. While the league attempts to preserve the integrity of the game, the potentially tainted pieces of baseball can be a driving force in the popularity of the sport. After the lockout in 1994, McGwire and Sosa were in head-to-head battles for the most home runs in a season. On their heels was Barry Bonds. The big bombs reinvigorated interests in America's pastime.

Investigative reporting opened the eyes of many to the realities of the game. There was support from outside members involved in the CBA. The league not only felt this pressure, but so did the players. Yet it still took external pressure from both Congress and the fan base to swing MLB's drug-testing program from a soft, educational and preventative outfit, to a modernized disciplinary protocol delivered by a competent contemporary (i.e., WADA). Such collaboration enabled MLB to follow the recommendations of the Mitchell Report more seriously. There was a developing sense of accountability to one another to uphold the standards of the game. Had such pressures not existed, it is possible that there could have been no real progress on the drug-testing front in MLB.

A fundamental question remains: Is the program working? Two of the most prominent PED abuse cases bracket the entry of these more advanced monitoring programs. In chapter three, I compare the pre-Mitchell report BALCO scandal, involving the use of banned, performance-enhancing substances by professional athletes, to the 2013 Biogenesis story, when several MLB players were accused of obtaining hGH for the purpose of performance enhancement.

Chapter 3

BALCO and Biogenesis

Barry Bonds and BALCO

While there are many examples of illicit drug use throughout the history of baseball, there are two specific cases that warrant the most attention given the significance of the individuals involved and the manner in which they concealed their behavior from league and team officials: the Bay Area Laboratories Cooperative (BALCO) and Biogenesis scandals. An analysis of both cases is valuable because it reveals the methods both cohorts used to avoid detection and gain a competitive edge, which may inform future refinements to prevent such practices in the future.

Beginning chronologically, Barry Bonds and his association with BALCO entered the limelight upon the release of *Game of Shadows*. The book investigated Bonds' relationship with BALCO and revealed his use of performance-enhancing drugs for a five-year period beginning in 1998. Excerpts from the book were included in an article published in *Sports Illustrated* and claimed that Bonds used PEDs in the form of steroids, insulin, hGH and testosterone.

The steroids that Bonds reportedly used included winstrol and trenbolone. Trenbolone is a derivative a steroid that has been shown to alter the sensitivity of satellite cells, a precursor to skeletal muscle, to Insulin-like Growth Factor (IGF-1) and Fibroblast Growth Factor (FGF) (Thompson, 1988). In an experiment conducted at the University of Arizona, investigators found that rats treated with trenbolone acetate had satellite cells that were more responsive to the IGF and FGF than the control and demonstrated more hypertrophy and DNA accretion (Thompson,

1988). Trenbolone is a common steroid used to proliferate muscle cells in beef products and became the foundation a BALCO formulation known colloquially as, “The Clear.”

Winstrol is the trademark name for a dihydrotestosterone derivative called stanozolol. The steroid is approved for human use by the Food and Drug Administration (FDA). Stanozolol acts to build muscle by decreasing the amount of reactive oxygen species (ROS) produced by the mitochondria in the cell, thus protecting the cell from the effects of normal oxidative stress as a result of exercise (Saborido et al 2011).

Bonds continually denied steroid use throughout his career and has never had a positive test. Much of the evidence of Bonds involvement revolves around his relationship with his trainer Greg Anderson. Anderson worked with Bonds, and Victor Conte, founder of the BALCO laboratory. Both Anderson and Conte pled guilty to charges of money laundering and the selling of performance-enhancing drugs. Bonds, on the other hand, was indicted on charges of perjury and obstruction of justice for allegedly lying to a grand jury during the federal government's investigation of BALCO. The perjury charges against Bonds were dropped, and he was also initially convicted of obstruction of justice, but that was overturned in 2015 (Dolan, 2015).

Bonds began Winstrol in 1998 under the supervision of Anderson and soon learned to inject the steroid himself. However, in the spring of 1999, he blew out his elbow. What was diagnosed initially as a bone chip was found to be a torn triceps tendon. Perhaps Bonds' added muscle was too much for the tendon to bear. Bonds played only 102 games that year, but hit home runs at the highest frequency of his career. Before spring training in 2000, Bonds was beaten in a charity home run derby by Jose Canseco, who ripped 28 shots out of the park. Bonds marveled at Canseco's chiseled physique reportedly 255 pounds with no visible signs of fat.

To match the Cuban's gains, Anderson began injecting Bonds with Dec-Durabolin, a steroid used to treat anemia resulting from kidney failure (Fainaru-Wada and Williams, 2006). Anderson also added hGH to the regime. Bonds was said to have appreciated hGH because he felt it maintained his musculature with minimal intensive training. The demands of baseball limited his workouts to the point that he only trained during a home stretch with Anderson present.

During his years of steroid abuse, Bonds underwent an extraordinary change in both performance and physique. In 1998, Bonds tallied 37 home runs, the fourth-best number of his career. However, his total dwarfed league-leader Mark McGwire's 70 home runs. The following seven seasons in which Bonds was allegedly taking PEDs saw better home run figures than earlier in his career (Verducci, 2006). In five years, Bonds went from 206 pounds, to 228 beginning at the age of 33. This impressive gain in mass was unusual for the era (Lemire, 2007).

Game of Shadows consistently tied BALCO founder Victor Conte to previous PED abuse. Conte worked with Tim Montgomery, C.J. Hunter, and later Marion Jones, all who eventually tested positive for PEDs. Hunter and Jones eventually married, and the two began using "The Clear." "The Clear" was an analog of norandrosterone developed by Illinois chemist Patrick Arnold (Fainaru-Wada and Williams, 2006). Conte sent his clients the drugs in flaxseed oil under the name "Vince Reed" to protect the athlete's names. Hunter was the first of the group to begin using the drug, and the first to get caught. Jones eluded the charges for a substantial amount of time, and Montgomery was convinced to begin using it following success of fellow Americans Chryste Gaines, and Alvin and Calvin Harrison at the Olympics in Sydney.

After the successes at the Olympic level, Anderson felt it was worthwhile for Bonds to meet Conte and the three soon forged a business relationship. During the offseason, Bonds

trained heavily—about five days a week, performing as many as 14 exercises in a given session. Bonds and Anderson maintained the façade of non-dopers by emphasizing the mineral levels in his blood and the importance of ten milligrams. They framed themselves as hard workers in the gym and intelligent nutritionists outside of training. The *New York Times Magazine* and *Muscle and Fitness* both profiled Bonds and noted his strict six meals per day, 350-calorie per meal program, accompanied by a series of nutritional supplements and vitamins that he took several times throughout the day (Fainaru-Wada and Williams, 2006). Conte also added a level of sophistication to Bonds' doping. "The Clear" was designed to be undetectable across blood and urine-testing, and was paired with Clomid, a female fertility drug which would mask the steroids. Conte also prescribed a fast-acting steroid known as Andriol, or "Mexican beans." In English, it was known as testosterone decanoate (Fainaru-Wada and Williams, 2006).

After Conte and Anderson cemented their relationship, Bonds began a strict calendar for his performance-enhancing drugs. Bonds would go on three-week cycles with a week in-between each successive cycle in order to prevent detection. A sample eight-week period would be along the lines of hGH injections every other day, while alternating between "The Cream" and "The Clear". At the end of the third week, Bonds would take Clomid under the assumption that it restarted his body's ability to produce natural testosterone.

There are a couple of interesting takeaways from the overall process in which Bonds doped. First, was the proximity of BALCO to Bonds. Anderson had begun providing Bonds with steroids that he acquired himself before formally developing a relationship with Conte. He obtained these drugs from the local gym he worked. All the other players involved with the BALCO scheme were not natives to the area and would have to receive their shipments under

false names at their respective homes. Bonds benefited from having Anderson do most of the moving with his drugs so he could inject himself at home with relatively little suspicion.

Another element that helped protect Bonds throughout his illicit use was the power he held within the Giants organization. Most people outside of San Francisco were not fond of Bonds given his temperament and ego. This resulted in him being booed constantly on the road, even when he had not been proven to use PEDs. Despite his rash attitude, Bonds formed a relationship with the owner Peter Magowan. There was an incident in the summer of 2003 that effectively gave Bonds complete power in the clubhouse. A verbal dispute between second baseman Jeff Kent and third baseman David Bell escalated into a physical altercation once Bonds defended Bell. Kent and Bonds shoved one another as the television cameras captured all the action in the dugout. Manager Dusty Baker was forced to intervene and reportedly scolded Kent—prompting him to say he wanted to be traded because it was Bonds’ team anyway. After a blowing a 3-2 lead in the 2002 World Series, Kent and Baker’s service were not retained by the Giants, cementing Bonds as the key figure. Bonds went virtually unchecked in the closing stages of his career even demanding that Anderson and his staff were included in Bonds’ 2003 restructured contract.

Finally, a third dynamic that was involved in Bonds PED use was the external pressures of multiple investigations surrounding drug use in baseball. There were players like Ken Caminti and Jose Canseco who were open about their steroid use. Canseco’s book outed several players and resulted in criminal trials in Washington. After accusations of PED use appeared in interviews, Bonds reiterated he was clean, but did concede to using creatine (Fainaru-Wada and Williams, 2006). Creatine is a legal supplement designed to put on muscle mass by providing

additional energy during strength training and is effective in explosive activities such as swinging a baseball.

Overall, Bonds' unlikeable attitude did not garner any trust about his alleged PED use. Because he never officially tested positive, there will always be looming doubts in some circles about whether or not Bonds doped. However, looking at his numerical gains in the waning stages of his career, massive muscle growth, documented bouts of "roid rage" and a trail of documents unearthed in an FBI investigation of BALCO point to a conscientious effort to ingest banned substances.

Rodriguez and Biogenesis

Alex Rodriguez's PED history has a much more dynamic story arc than that of Bonds. Rodriguez was a highly-touted high school prospect drafted with the first pick in the 1993 MLB draft by the Seattle Mariners. After just 32 games in the minors, he was called up to the big leagues and played 17 games before a lockout cut the 1994 season short. By 1996, Rodriguez earned the starting shortstop position and soared into prominence winning the American League batting title and finishing second in a controversial American League Most Valuable Player voting. His production went slightly down, but still warranted a start in the All-Star game in 1997. Rodriguez was the first player to start at shortstop for the American League other than Cal Ripken Jr. in 13 years. In 2000, Rodriguez's contract with the Mariners expired and he became a free agent. During his time in Seattle, he hit 189 home runs in seven seasons (Baseball Reference, 2016:2). As the most attractive free agent option on the market during the offseason,

Rodriguez received massive contract offers before finally deciding to sign with the Texas Rangers. The 10-year \$252 million deal was a record across major league sports at the time.

The deal received criticism across several media outlets because of its tremendous hit to the Rangers' payroll, which could have been more effectively spread to multiple players to improve the squad more holistically. Rodriguez admitted that this critique resulted in a palpable amount of pressure. Despite the constant scrutiny, Rodriguez excelled in Texas, hitting 52, 57 and 47 home runs in his three seasons with the Rangers. However, Rodriguez's uptick in production failed to propel his squad into the playoffs and the bottom-dwelling Rangers finished last in the division each year, including his 2003 season where he won the AL MVP award.

After an offseason injury to New York Yankees third baseman Aaron Boone, Rodriguez was acquired from the Rangers after he agreed to switch to third base and the Texas club absorbed a significant chunk of his contract. Rodriguez started off strong with the Yankees, becoming just the third player in history to reach 35 home runs, 100 runs batted in (RBI) and 100 runs in seven consecutive seasons. In 2005, Canseco's book claimed that Rodriguez was one of many players to be doping. Undeterred by the accusations, Rodriguez finished the season playing in every game and posting 48 home runs and 140 RBIs to earn his second AL MVP award. However, these accusations were ultimately proven to be legitimate. In 2007, Rodriguez was interviewed by Katie Couric for CBS's *60 Minutes* and denied any association with steroids or performance-enhancing drugs of any kind. Two years later in February 2009, David Epstein and Selena Roberts of *Sports Illustrated* revealed that Rodriguez had in fact tested positive for Primobolan and testosterone in 2003. At the time, the league was under a testing protocol, which lacked punishment for positive tests and kept results anonymous. Primobolan is another

dihydrotestosterone-based steroid that is often paired with other steroids. On its own, the drug is designed to increase strength in lean muscle with minimal bulking (Prunty, 2009).

Originally denying the report, Rodriguez reversed his stance and admitted to his PED use a television interview with ESPN's Peter Gammons. He cited pressure as the primary reason for his decision to begin taking banned substances. "I felt like I had all the weight of the world on top of me, and I needed to perform -- and perform at a high level -- every day," Rodriguez said. Rodriguez blamed "a different culture" in baseball, as well as his naïve youth for his actions. He would go on to apologize, but also stated that he was not aware of what drug he tested positive. Rodriguez's propensity to lie continued when he later told reporters that he took "boli" he received from his cousin in the Dominican Republic (Kepner, 2009). Rodriguez appeared to develop a façade where he deflected responsibility for his illegal actions and tried to play the victim. This was evident to the head of the United States Anti-Doping Agency (USADA) Travis Tygart. "He claims to be sorry that he used hard-core steroids, but it is obvious that he is only sorry that he got caught," Tygart said in an e-mail to the *USA Today*. "If he was sorry he that he used, he would have admitted it in advance" (Perez, 2009). Others were more sympathetic toward Rodriguez, like Representative Elijah Cummings (d-MD), a member of the House committee who brought players such as McGwire and Sosa to the Capitol, who said, "While I was disappointed to learn that Alex Rodriguez tested positive for steroid use, I admire him for demonstrating the courage to come forward and be honest. We are all guilty of making mistakes, but what distinguishes a hero is the ability to acknowledge those mistakes and the commitment

to learn from them.” Rodriguez also reiterated that his time with the Yankees was completely free of PEDs, for the moment, at least.

Part of what made Rodriguez appear to be so insincere, in retrospect, is how quickly he sought performance-enhancing drugs following his admission to previous use. In 2010, Rodriguez arranged a meeting with the owner of Biogenesis of America, an anti-aging facility in Coral Gables, Florida, Anthony Bosch. Bosch, whose credentials fluctuate from trainer to nutritionist, said that Rodriguez approached him about what drugs he gave to Manny Ramirez in 2009. At age 35, Ramirez worked with Bosch and saw his home run total double under Bosch’s program. Bosch claimed Rodriguez wanted in on the product. Rodriguez, who at the time was 34, was seeing a dip in his overall production and struggled with the wear-and-tear of the body associated with a long MLB season. Bosch went on to claim in an interview with *60 Minutes* how concerned Rodriguez was with the intricacies of a doping program:

Alex cared. Alex wanted to know. He would study the product. He would study the substance. He would study the dosages because he wanted to achieve all his human performance or in this case, sports performance objectives. And the most important one was the 800 Home Run Club.
(Pelley, 2014)

This contradicts the notion that Rodriguez was unfamiliar with what drugs he took during his time in Texas. Bosch went on to explain Rodriguez’s obsession with consistency in his dosages and the timing of each intake. This approach contrasts with Bonds who took his injections and pills whenever he wanted, not necessarily when it was best according to the program.

Bosch had a detailed outline of all the banned substances that Rodriguez was taking and the proper time for their delivery. This regimen also included routine blood tests in order to

ensure Rodriguez was clean. Bosch had Rodriguez taking a concoction of PEDs, including testosterone and human growth hormone. The primary form of PED Rodriguez used was the testosterone lozenges, or troches that Rodriguez would take shortly before a game would begin. Also referred to as gummies, these testosterone-loaded lozenges would elevate Rodriguez's strength and energy and all traces of the drug would be out of his system by game-time. Rodriguez's protocol had his "glow time," or period where he would test positive for banned substances, to be limited to a period in which it was impossible to be tested because he was competing. Rodriguez also took other levels of precaution in the way he took drug tests—specifically urine. Bosch and Rodriguez developed a plan that would have Rodriguez miss the cup for the initial stages of urination, hit the cup with middle of his stream, and then avoid getting of the end-stage urine in his sample. According to Bosch, the beginning and end of urination were the primary culprits for metabolites that would signal a positive test (Pelley, 2014).

To prevent detection, Bosch and Rodriguez used different codes to disguise the performance-enhancing drugs they were actually referring to, "Cohete," the Spanish word for rocket, was actually an injectable PED. "Night Cream" was an ointment filled with testosterone. Text message seems to be the primary form of communication between the two. Rodriguez would receive a text from Bosch outlining the day's supplementation:

1 click of night cream at night

1 cojete at night

1 click of night cream in the morning

1 gummie in AM

4 clicks of night cream before leaving to the field

1 cojete in the AM. If u have pink cream before game. Any oral pills in AM

In reference to the regimen, Tygart stated, “probably the most potent and sophisticated drug program developed for an athlete that we've ever seen” (Hilbert, 2014). The combination of fast acting drugs to avoid detection, aid recovery and build power was ideal for Rodriguez to become the only member of the 800 Home Run Club.

Rodriguez’s PED abuse came to light when an angry business partner of Bosch’s stole documents and presented them to the *Miami New Times*. Major League Baseball began its investigation of Rodriguez in a different manner than it had in the past. Previously, the league was willing to let things pass if they believed it was beyond reconciliation. However, this time Commissioner Bud Selig was willing to be more aggressive while also protecting Rodriguez. Selig claimed that he had never seen anything like what Rodriguez had done, and believed that Rodriguez warranted a 211-game suspension. While that suspension was later reduced to 162 games by an arbitrator—equivalent to the entire 2014 season—it was the largest non-permanent ban in MLB history (Wallace, 2014).

Rodriguez continued to combat the legal system and he reiterated his innocence to the public for several months following Bosch’s interview with CBS in January 2014. In November of the same year, Rodriguez admitted to the Drug Enforcement Agency and other federal agents that he had taken performance-enhancing drugs supplied to him by Bosch (Weaver, 2014). With his statement, Rodriguez protected himself with direct immunity from the criminal aspects of the Biogenesis case (Bosch, and Rodriguez’s cousin and middle-man, Yuri Sucart, had none). Thus, Rodriguez has avidly declined the use of PEDs in his career two times before finally submitting that he cheated. Like Bonds, Rodriguez was involved with the legal system. However,

Rodriguez's situation was self-imposed by engaging with lawyers in order to prove his innocence. An innocence which proved to be nonexistent.

Bonds and Rodriguez's doping cases share a number of commonalities. For instance, the people behind their PED protocol are not even qualified trainers or doctors. Conte was a former musician who later opened a nutrition center designed to help athletes manipulate drug testing. Bosch, who did attend medical school in Belize, never had a license to practice medicine in Florida. It is likely that those who failed to succeed on the moral side of the medical profession switch over to a black-market approach and make a living using their knowledge to manipulate sport.

The supplier of PEDs to each athlete was also similar in that both received different drugs that worked in conjunction to achieve their goals. The specific steroids were not the same, but the combination of steroids, hGH and testosterone was similar. What separated the two athletes was the manner in which they avoided detection. Bonds' doping regime had drugs that remained in his system for a longer period of time than Rodriguez's. As a result, Bonds needed to use the female fertility drug Clomid in order to cover up metabolites that would indicate steroid use. Rodriguez's more advanced drug ran its course more quickly and did not require any masking agent. It is important to note that Rodriguez did have a confirmed positive test in 2003, but that was before he was associated with Bosch and Biogenesis. Because both cases were very intensive in their own sampling of blood and urine, neither had positive tests for performance-enhancing drugs when working with another party.

Another similarity between the two is the use of an established dispensary to obtain their doping programs. Both players began using drugs obtained by an intermediary in the early stages of their career (Anderson at the gym he was employed; Rodriguez's cousin in the Dominican

Republic), but later switched to an actual commercial site. Bonds entrusted Anderson with any aspect of his PEDs, so when Anderson approached him about Conte, it was reasonable for Bonds to give the man behind BALCO a shot after hearing about the success of Olympic athletes who worked with the San Francisco facility. Rodriguez's second bout with PEDs arose from his desire to shed a few pounds. His cousin, the same one involved previously, said he done achieved this by going to Bosch's anti-aging clinic. It turned out that Ramirez had worked with Bosch and that spurred Rodriguez's interest in establishing a relationship.

Like Bonds, Rodriguez also was belligerent with media. When the story of the 2003 positive test leaked, Rodriguez accused journalist Selena Roberts of trespassing in his home and even filed claims with the police department. There is documentation of an incident between Roberts and a security guard at the complex where Rodriguez lived, but there was no evidence of her attempting to break into the home as Rodriguez claimed (ESPN, 2009). Additionally, Rodriguez's longstanding ability to lie to the media did not establish any sort of trust between the two parties and forced him to be more defensive than perhaps he should have.

Clearly, Rodriguez and Bonds sought the same goal through their use of PEDs, but there were a couple of nuances to each's approach that make them unique. Bonds relied heavily on his trainer Gary Anderson. Anderson was Bonds' right-hand man. Having disintegrated many of his relationships with his pugnacious, demanding attitude, Bonds did not have many friends beyond those he paid. He isolated himself, even amongst his teammates, with his own wing of the locker room where no one else was permitted. Bonds' power trip became dependent on maintaining a relationship with Anderson so that he could continue getting supplies from Conte and BALCO. The fact that Bonds insisted that Anderson be incorporated into his contract with the Giants while Anderson was not even an employee of the organization is a testament to his reliance. On

the other hand, Rodriguez was far more passive with his approach to his supplier. Bosch did admit that Rodriguez was not fond of needles and personally had to inject the ball player on multiple occasions, but it seemed as if Rodriguez sought to dissociate himself with Bosch. Utilizing text messages separated the two from being seen together and arousing any suspicion. Perhaps it was a product of the technology at the time that made texting more convenient than interpersonal communication, but there is a clear difference between how the two operated.

This can be said about the PEDs used by Bonds and Rodriguez, as well. Since Biogenesis and its products were formed approximately five years after BALCO was investigated, it had the advantage of advancements in steroid chemistry. It can be argued that it was more difficult to evade detection during testing because of modern methods, but looking back into the protocol for testing during the years Rodriguez was working with Biogenesis (2010-October 2012), the tests were not adequate enough to catch him. This holds especially true when accounting for the extra measures taken by Rodriguez specifically during a urine test.

However, it is quite easy to see how these two doping programs were shaped by the testing program in practice of the day. During Bonds' prime time for PED abuse, the testing protocol was in its infancy; testing was just beginning in the minors during his final two years of alleged doping. He did not face nearly the same obstacles as Rodriguez. For Bonds, it was simple. Do not get caught with the materials and keep healthy. There was no hGH testing, and steroid testing only began at the end of his accused period of doping. Rodriguez actually was involved in both periods of testing. He was a part of the first anonymous survey that ultimately proved that he was taking PEDs back in 2003. It was after the Mitchell Report recommended that MLB outsource its testing to a WADA accredited facility that it got tough for Rodriguez. Fast acting drugs and constant blood and urine profiling kept him on edge.

Chapter 4

Moving Forward

The steroid era from the early 1990s to the early 2000s represents a dark time in America's professional baseball history. Long-standing records broken during this age are argued to be tainted because of the widespread performance-enhancing drug use (Associated Press, 2007). Since it is difficult to delineate the exact depth of the level of doping, there will always be a cloud over this time period. However, rather than dwelling on the past, it is important for Major League Baseball to examine documented examples of doping to continue to develop its system.

Were the improvements instituted following the Mitchell report sufficient to prevent abuse? The available evidence supports an unequivocal answer of, "no." Even after MLB instituted the recommendations from the report, it failed to rid the problem. What was posed to be a saving grace, did little in the way of preventing players like Alex Rodriguez from doping. Had protocols such as a biological passport been adopted when WADA was utilizing them, Rodriguez would not have been successful in his doping attempt. Because there was no way to track transient changes, Rodriguez was in the clear from the testing program of his time.

One of the possible routes that MLB could take is to fully align itself with WADA and its drug policies. This alignment would remove any conflict of interest that the league may hold in both its testing procedures and punishments. The strict punishment scale employed not only is a deterrent, but a swift means of eliminating and isolating known cheaters. A stricter scale emulates the National Basketball League's stance on recreational drug abuse, which is a one-and-done model. In the NBA, if a player is tested positive for a drug (other than marijuana), he is

banned with an opportunity for reinstatement in some cases (Abbot, 2013). Overall, total WADA ruling adoption would set a standard for major sports in America. Additionally, it creates a standard drug-testing protocol for athletes across the board, essentially creating a level of predictability in both testing protocol and punishment for athletes at numerous levels of competition. WADA and MLB have been working together for nearly a decade now, but the failures have been because MLB does not absorb the newest technology when it becomes available. It continues to use WADA-approved labs, but does not effectively use the best tests. Under WADA, the most modernized testing program would be available as new technologies were approved. However, given the Major League Baseball Players Association's history of opposing significant change in the drug-testing spectra, it would be unlikely to agree to this transition. WADA establishes its rules and any athlete participating in a WADA-governed competition must follow those rules. In that sense, the MLB Players Association would have to forfeit its right to negotiate specifics in the drug-testing protocols, a right it is more likely unwilling to give up.

Another way that the MLB could improve its testing program is to depend on a third party, whether it be journalists, a government agency, or a combination of both, to monitor suspicious activity and conduct independent investigations. Journalists have seen their access decline steadily over the past decade. In the past, reporters could interact with players for several hours before and after game time in the clubhouse. Now, there are restrictions on the time and location that writers can meet with the players. Organizations are using social media and other outlets to send the message out to their fan base themselves rather than relay information to an intermediary like a journalist.

Investigative reporters have proven to be a valuable tool for MLB. As seen in both the BALCO and Biogenesis scandals, the media was a major component in not only conveying the details of each incident, but was vital in unearthing critical information. Effective media works without bias. If there is a hint of wrongdoing, the press will expose it. They have no incentive to, unlike an individual club or the entirety of MLB potentially might. Reporters do not have a product to protect. Some athletes will try to gain any advantage they can. No drug testing and education program can be 100% effective. Third-party investigators can be used to seal up any cracks in a protocol, no matter how strong it is. It is an extra layer of defense in the battle against PEDs that MLB cannot afford to lose.

The third way that MLB can improve its drug program is to reinforce educational aspects and provide the necessary nutritional and personal training resources for players at the club level. One of the commonalities between BALCO and Biogenesis was that both Bonds and Rodriguez worked with unqualified “doctors” with no affiliation to the club. Because their associates were not involved with MLB, they were willing to take chances and violate rules in order to get their client where they wanted to be. Bosch and Conte were not only immune to MLB rules, they scoffed at them. Bonds’ relationship with Anderson was particularly alarming given the power that Bonds had within the San Francisco Giants. Anderson, an employee at a gym with a reputation for dealing steroids, became a regular feature in the clubhouse.

Some clubs are already offering rooms within the clubhouse stocked with various approved supplements for use. This is a smart move by organizations because they have better control over what the players are actively using to take care of their bodies. It is a step toward protecting its brand. If a player tests positive for a PED, it reflects poorly on the team and the

organization as a whole. By offering approved substances, it alleviates some concern over harming the brand.

In addition to the stockroom, organizations should require players to use in-house trainers. As mentioned previously, outside trainers and nutritionists do not necessarily have to follow the rules, nor do they need appropriate professional qualifications. As long as they are paid, they will do what they can. If players insist on working with trainers that are not affiliated with the club, these trainers should, at a minimum, be screened and briefed with MLB rules and regulations in order to maintain player satisfaction while ensuring that everything the players do is legal. Enforcing this education as a league-wide rule would create even more protection for MLB and its affiliate members. Having all employees educated, trained, and approved by the governing body is the best way to ensure that the integrity of player development is upheld. It would even be beneficial for the player themselves to sit on this sort of meeting to get a better understanding of the intricacies of drug testing.

It is clear that an educational model alone is not sufficient. Whether it is because a player is young and naïve, or desperate to make the majors, people make mistakes. It is the duty of the organizations to teach these players how to maintain strength and recovery throughout the season with additional teaching sessions, or simply having a full-time staff member responsible for monitoring the stock room to inform players about what the legality and efficacy of sports supplements – both legal and illegal.

Conclusion

Performance-enhancing drugs (PEDs) present a considerable problem to any sporting organization. The desire to be the best drives many of the world's best athletes. Sometimes this pursuit encourages risk-taking with PEDs. It is the responsibility of Major League Baseball to develop an effective system that both teaches its players about the impact of PED use, but also is powerful enough to dissuade PED use through testing and enforcement of penalties. Bay Area Laboratory Co-operative (BALCO) and Biogenesis present two recent examples from different testing periods where drug-testing protocols changed markedly, largely in respect to the Mitchell Report. Both instances share important commonalities, particularly the role of intermediaries, disreputable trainers and nutritionists, and investigative journalists that helped reveal the depth of the PED abuse. These similarities may help drive Major League Baseball's drug testing programs in the right direction. Steps such as encouraging third-party investigation outside of traditional testing programs, incorporation of a full-scale stockroom and nutritional education within the organization and more rigorous application of current World Anti-Doping Agency testing procedures can begin an effective dissociation from baseball's darkest age.

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Academic Vita

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Education

Pennsylvania State University, University Park, PA 2011-May 2016

- Schreyer Honors College, College of Health and Human Development
- B.S. Kinesiology, John Curley Center for Sports Journalism Certificate

Relevant Experience

Autonomic Neurophysiology Laboratory; University Park, PA Fall 2014-Spring 2016

Lab Assistant

- Conducted experiments concerning sympathetic and muscular nerve activity
- Reorganized filing system and laboratory safety notebook

Philadelphia Union; Philadelphia, PA

Summer 2013

Shadowed Medical Staff

- Observed injury evaluation and diagnosis in training room
- Monitored players in-game for potential injury
- Transported appropriate medical equipment on game day

Coordinated Health; Bethlehem, PA

Spring 2014

Shadowed Dr. Scott Stoll

- Observed plasma rich platelet and epidermal steroid injections
- Refined understanding of joint issues, such as, sciatica and spinal stenosis

The Daily Collegian; State College, PA

2013-2015

Senior Staff Writer

- Lead beat writer for women's volleyball, including national championship story, and men's lacrosse
- Created multimedia content for print and online platforms
- Collaborated with other college media outlets like the Stanford Daily

Work Experience

United States Golf Association, Far Hills, NJ

June 2008, 2012 July 2009, 2013

Photography Assistant