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Not the Last Word

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Not the Last Word: The Rational Calculus of Sports Injuries

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Sports and medicine have been linked since Galen treated the gladiators of ancient Rome, but this linkage has never been tighter than it is today. We are in, by all appearances, a sports injury epidemic. Seven NBA players ruptured their Achilles tendons in the 2024–2025 season [15]. Tommy John surgery is now so common—more than one-third of Major League pitchers have had it, according to the American Medical Association [3]—that the scar on the medial elbow has become a kind of ritual tattoo, proof that you've arrived.

It's easy to look at the injury stats and come away believing something is rotten in the state of sports [1]. But I'm not so sure. This "epidemic" may simply reflect rational choices being made in response to powerful incentives—incentives that point unambiguously toward excess.

Consider a young pitcher. The difference between throwing 92 mph and 96 mph can mean the difference between obscurity and a Major League contract. But the torque required for those extra 4 miles per hour can also mean the difference between an intact ulnar collateral ligament (UCL) and a ruptured one. The injury risks are real, but they're rationally discounted; disability matters little if you never reach the next level. For many athletes, it's an acceptable trade-off. Most pitchers will push it.

From the perspective of team owners, too, the system is entirely rational. Winning requires maximal effort, and the economics values victory. If one player goes down, he will be replaced. Injury is a setback, but it's already priced into the model—general managers now spend as much time managing injury risks, salary caps, and contract structures as they do evaluating talent [11]. In this era, the notion of winning by mastering sport-specific arcana like on-base percentage, as described 20 years ago by Michael Lewis in his book, *Moneyball* [12], seems quaint and out of date.

Other domains demand different strategies. In Hollywood's Golden Age, studios treated stars as long-term assets, investing in their sustained development. Armies, too, take the long view—training soldiers is expensive, and replacing them even more so. Even autocracies like Russia eventually must confront the finite supply of young men available for military service [13].

When talent is scarce or contracts are long-term, it is entirely rational to prioritize preservation, but only then. These days, there is a seemingly bottomless well from which new players can be drawn, and when the cost of injury can be absorbed by the payroll structure, the "burn-bright-and-burnout" model works well enough for athletes and the teams that pay them. A fracture on the field becomes just another bad break, in both senses of the term.

Still, there are other participants in the larger debate about sports injuries. Society has interests that must be considered as well.

One such interest is the prevention of injuries whose consequences are catastrophic. Catastrophic injuries might impose monetary costs absorbed by the public, which is left to care for the injured athlete. Spinal cord injuries are one such example. Quadriplegia is so devastating that spear tackling has been regulated out of football. Other catastrophic injuries may generate repugnance toward the sport that caused them. Chronic traumatic encephalopathy—with its risk of

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dementia, mood changes, aggression, impulsivity, and even suicide—comes to mind. At some point, the harm from certain sports injuries becomes so great, whether measured in money or in morals, that the participants' consent to assume the risk is no longer decisive.

That's not to say consent doesn't matter; it does. But consent is only necessary, not sufficient. A lack of consent is another reason society may need to intervene. Children are the obvious case: they lack both the legal standing and cognitive maturity to consent to long-term risk.

That brings us back to Galen and the gladiators. In ancient Rome, concerns about cost and consent eventually triggered reform of the sport. Shortly after taking the throne, Emperor Constantine began to see the spectacle of a lion mauling a slave as an obscenity rather than entertainment. That the slave, conscripted into the arena, had no freedom to accept or reject the risk of death only added to the insult.

Consent and catastrophe remain as proper boundaries for intervention. When injuries risk devastation, or when the assumption of risk is not truly free, society must act. Short of that, injury management is just another variable in the general manager's equation. Perhaps the next great front-office innovation will come from an injury-savvy orthopaedic surgeon. I can't wait to read a Michael Lewis book describing it. *Medicine Ball*, anyone?

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Dr. Bernstein correctly labels the choices that young baseball players make as a risk/benefit analysis. They choose to push the physical limits of their bodies to attain success and are willing to take the risk of UCL rupture. And why not? Although the rehabilitation is lengthy and arduous, the likelihood of return to play is high at 80% (and 72% return to previous level of play) [10], and I have learned through my experience that many of these athletes believe the player's ability to pitch can be improved by the procedure. Even for those players who don't make it back, the long-term consequences of a UCL reconstruction are not bad; the elbow generally works well following surgery and allows unrestricted use in most day-to-day activities, as the elbow is most commonly exposed to varus forces, which don't depend on the UCL for stability. With Major League Baseball (MLB)'s data tracking capabilities, team officials have a good idea of how many injuries they will see and what quota of pitchers they need to keep in reserve. I am sure this information is taken into consideration when calculating salaries.

The question of consent is a sticky one, as children want to please their parents and their peers. A young player with a sore elbow is often seen in the office during working hours with both parents present, who often emphasize the singular importance they place on that child's ability to progress in baseball. "The scouts are looking at him," parents often say, "they say he has Big League potential." From the child's side, baseball is very important because it is the activity that focuses the attention on him. What child would want to end that?

Ultimately, players and their families do not understand the steep pyramid that prevents even Minor League players from ever making it to the Major Leagues, so it is difficult for any parent to make a truly informed decision. This is why the sports medicine physician—and the sports medicine community, in general—is so valuable in this equation. We have not been passive observers complicit with a generation of young baseball players who are willing to blow out their ligaments for fame and fortune. We have not been waiting around to reconstruct their UCLs as a cobbler waits for you to wear out the soles of your shoes. From the moment the "epidemic" of UCL tears became evident, the sports medicine community sprang into action to determine the causes, methods of prevention, and effective treatment options. Dr. James Andrews spearheaded efforts to alert the baseball community [9] and developed guidelines for limits in pitch counts based on the player's age [14]. Pitching mechanics have been carefully studied, and high-risk techniques have been identified, such as side-arm pitching or throwing curveballs before reaching a certain level of skeletal maturity (which differs for each child, so we advise against throwing curveballs until one has started shaving). The anatomy of the UCL has been carefully studied, and the early surgical techniques of Dr. Frank Jobe [6] have been fine-tuned by Drs. David Altcheck [5] and Andrews [2], as well as with the use of an internal brace [8]. All that said, I believe most sports medicine surgeons who care for baseball players would be happy to not perform another UCL reconstruction. Continuing to work on preventative techniques that limit their occurrence is the way forward.

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The way in which we approach sports in America and the natural fallout from that approach (sports injuries) is very

rational if the primary goal is to win the game. Winning—whether it's an NFL football game, a Division 1 volleyball match, a high school cross-country meet, or an 8U select soccer game—often boils down to who was willing to commit the most time, work, effort, and resources into building the necessary talent and skills to be better than everyone else on the opposing team. Sometimes, it also boils down to who is willing to take the most risk.

In this regard, sports—and especially youth sports—have become a type of Shubik auction, which is a term Dr. Bernstein previously and aptly used to describe what is happening with orthopaedic surgery residency applications [4]. Every year, it seems like more money is being poured into private lessons and expensive gear; more time is required because of longer seasons and traveling to compete; more effort is being invested into finding the "right" team or situation for one's child; and, most importantly, more kids are willing to take on the risks of playing to their physical max and are pouring into our offices with their torn ACLs and painful throwing arms.

The kids and families who win this auction get memories of winning the (*really* super-duper important) game, and fewer than 2% will achieve the dream of playing for an NCAA Division I school by way of an athletic scholarship [16]. The losers of this auction are left with memories of coming up short despite all the time, money, and effort they poured into their sport, and many will have a sports injury, perhaps a serious one, as one of their enduring memories.

Dr. Bernstein suggests that society may need to intervene because of the lack of consent our children have provided in being subjected to all of this. However, society is no better equipped to stop what is happening in sports than it is in stopping our kids from doomscrolling on social media or eating junk food. We have all seen the dads who yell at the umpires of Little League games for 7-year-olds (who are trying to throw their arms out, by the way), and the unreasonable moms in the office who push for their 14-year-old daughters to get back to competitive gymnastics despite having painful shoulders, because "they're being looked at" by national teams. Society has noticed that parents are increasingly willing to do whatever it takes for their child athlete and has exploited this, making youth sports the massive $40 billion industry it is today [7].

Youth sports used to be about getting kids outdoors to spend time and socialize with friends; not winning every game. Improving skills and learning how to be a part of a team are the types of rewards that kids are looking for. If we can get youth sports back to focusing on that, we all would win.

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