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## Injury Rates in Major League Baseball during the 2020 COVID-19 Season

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# Injury Rates in Major League Baseball During the 2020 COVID-19 Season

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*Investigation performed at the University of Kentucky, Lexington, Kentucky, USA*

**Background:** The 2020 Major League Baseball (MLB) season was drastically altered because of the COVID-19 pandemic. The changes included an extended layoff between March and July as well as a shortened preseason.

**Purpose/Hypothesis:** To determine the incidence and epidemiology of MLB injuries in the abbreviated 2020 season compared with prior seasons. We hypothesized that there was an increase in the overall injury rate in the 2020 season compared with the 2018-2019 seasons and that it equally affected all body regions.

**Study Design:** Descriptive epidemiology study.

**Methods:** The MLB transactions database was queried to find players who had been placed on the injury list between 2018 and 2020. Injuries were categorized into upper extremity, lower extremity, spine/core, and other injuries. Incidence per 1000 athlete-exposures was calculated for the prior 2 seasons (2018-2019) and for the 2020 season separately. Incidence for each category was also calculated separately for pitchers and fielders. Incidence rate ratios (IRRs) and confidence intervals were used to compare injury rates in 2018-2019 versus 2020. The z test for proportions was used to determine significant differences between injury incidences.

**Results:** In 2020, the overall incidence rate per 1000 athlete-exposures was almost twice the rate compared with the 2 seasons before COVID-19 (8.66 vs 5.13; IRR, 1.69 [95% CI, 1.53-1.87];  $P < .001$ ). Injury incidence increased similarly in 2020 for both pitchers (IRR, 1.68 [95% CI, 1.47-1.91];  $P < .001$ ) and fielders (IRR, 1.68 [95% CI, 1.45-1.96];  $P < .001$ ). Increases in injury incidence were seen in the upper extremity, spine/core, and other injury categories; however, the incidence of the lower extremity did not change significantly.

**Conclusion:** There was a significant increase in injury incidence for both pitchers and fielders in 2020. Injury rates increased in anatomic zones of the upper extremity and spine/core but were not significantly changed in the lower extremity. The overall increase in injury rate suggests that irregular or insufficient sport-specific preparation prior to the start of the season placed athletes at a greater risk of injury when play resumed.

**Keywords:** baseball; coronavirus; COVID; injury; major league baseball

The COVID-19 pandemic has affected every facet of society, and sports were no exception. On March 12, 2020, Major League Baseball (MLB) decided to cancel upcoming Spring Training games and delay its season.<sup>49</sup> Every sports league, from amateur to professional levels, was forced to make significant adjustments to allow play to resume. Eventually, the MLB resumed play on July 24, 2020, with a 60-game schedule designed with minimal team travel in mind.<sup>1</sup>

The drastic changes in the professional sports schedule tested the fortitude of players and personnel alike, but the uncertainty also disrupted preseason training and conditioning. While limited individual workouts were allowed by some teams as early as May, COVID-19 infections and frequent schedule changes led to many

interruptions to the usual preseason physical preparation of players.<sup>49</sup> Previous studies investigated the epidemiology and the anatomic distribution of MLB injuries in normal seasons<sup>35</sup>; however, it is unknown how such an irregular season and off-season may affect injury incidence. While the evidence for optimal injury prevention is still incomplete, existing literature links limited physical preparation, lesser aerobic condition, and preseason strength deficits to increased injury rates.<sup>7,18,45</sup> This association is based on fundamentals of stress theory that a stimulus (or stress) that is too large applied to an insufficiently adapted tissue may result in injury.<sup>32</sup> This concept is supported by greater injury risk with greater increases in week-to-week workload in high-level rugby and Australian rules football players. The increased risk is attributed to improperly applied overload.<sup>9,34,38</sup>

Since the 2020 preseason and regular season were disrupted and condensed, it is possible that injury risk would

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be increased. The purpose of this study was to determine the incidence and epidemiology of MLB injuries in the abbreviated 2020 season compared with typical 162-game seasons in the same era. We hypothesized there was an increased injury rate in the 2020 season compared with pre-COVID-19 seasons. We additionally hypothesized that the increased injury rate affected all body regions equally.

## METHODS

Data from the 2018-2020 MLB transaction reports were extracted online at [mlb.com/transactions](http://mlb.com/transactions).<sup>30</sup> All injuries that resulted in a player's being placed on the injured list (IL) were collected for analysis. Players are placed on the IL for 10 to 60 days (15 days for pitchers) after a physician's determination that they are unable to play.<sup>29</sup> In the 2020 season, the higher limit of this range of the IL was decreased to 45 days, and for pitchers, the lower limit was decreased to 10 days.<sup>29</sup> Multiple injuries that occurred in the same season at the same time were accounted for individually. From the database, we collected publicly accessible data, such as player name, date of IL placement, position, and body part injured. The specific type of injury was not analyzed, as the public database was limited on further injury details. We then categorized each injury into the anatomic areas of upper extremity, lower extremity, spine/core, and other injuries. The other category consisted primarily of head injuries and medical reasons (upper respiratory infection, viruses including COVID-19, gastrointestinal illnesses) for being unable to play. Positions were sorted into pitchers and fielders. Fielders included all positions other than pitchers.

We calculated the injury incidence per 1000 athlete-exposures using the same method described by Posner et al.<sup>35</sup> One athlete-exposure was defined as 1 game per athlete. Therefore, for the pre-COVID-19 cohort (2018 and 2019 seasons), total exposures were calculated using a 162-game season, 25-man active roster (of the 40-man potential player pool),<sup>29</sup> and 30 teams in the MLB equating to 121,500 athlete-exposures per year. The incidence rate for the pre-COVID-19 cohort was calculated using the cumulative number of injuries and exposures in both years. For 2020, athlete-exposures were calculated using the 60-game season, 30-man roster for the first 2 weeks, 28-man roster for the second 2 weeks, and 26-man roster for the remainder of the season (expanded in 2020 to include a 60-man potential player pool),<sup>3,13</sup> and 30 teams in the MLB, resulting in 48,960 athlete-exposures.

Injury incidence was evaluated overall and for each anatomic zone. We controlled for the differences in infectious reasons by separately analyzing IL placements for all anatomic zones apart from other (labeled as "total-other"). Subgroup analysis was performed to determine the incidence of injury for pitchers and fielders separately. In addition, we controlled for the potentially higher rate of injury in the early season by evaluating the incidence of pre-COVID-19 in March, April, and May (termed "early season") versus incidence of injury through the 2020 season. Anatomic zones were then further subdivided to calculate the incidence of injury to each specific body part. The incidence rate ratio (IRR) was calculated by dividing incidence in the 2020 group by incidence in the pre-COVID-19 group. Finally, we analyzed the proportion of injuries occurring in each anatomic zone overall and in the subgroups of pitchers and fielders.

Differences in incidence for the overall group as well as each subgroup were statistically analyzed using the  $z$  test for proportions. The chi-square test was chosen as the appropriate test to analyze differences between the pre-COVID-19 and 2020 injury distributions. As a result of the nominal nature of the data, no normality assumption was required.<sup>26</sup> Further post hoc testing of proportional distribution by anatomic zone was performed using the  $z$  test for proportions. R software Version 4.0.2 (R Foundation for Statistical Computing)<sup>36</sup> was used for data analysis. Statistical significance was set at  $P \leq .05$ .

## RESULTS

In the pre-COVID-19 seasons, there were 1246 players placed on the IL. In 2020, there were 424 placements on the IL. Pitchers accounted for 55.0% (685/1246) of the injuries before COVID-19 and 56.8% (241/424) in 2020. The overall incidence rate per 1000 athlete-exposures was almost twice the rate in 2020 compared with the pre-COVID-19 cohort (8.66 vs 5.13; IRR, 1.69; 95% CI, 1.53-1.87;  $P < .001$ ) (Table 1 and Figure 1). There were similarly increased incidences of injury in both pitchers and fielders in 2020 (IRR, 1.68; 95% CI, 1.47-1.91;  $P < .001$  and IRR, 1.68; 95% CI, 1.45-1.96;  $P < .001$ , respectively). Increases in injury incidence were seen in the upper extremity, spine/core, and other injury categories; however, the incidence of lower extremity injuries did not change significantly (Table 1 and Figure 2). The largest IRR different was seen in the "other" category, but the significant difference in injury remained when infections were removed from consideration as displayed in the "total-other"

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Ethical approval was not sought for the present study.

TABLE 1  
Incidence Comparison Overall, Pitchers, and Fielders<sup>a</sup>

Cohort	Incidence per 1000 Athlete-Exposures		IRR (95% CI)	P Value
	Pre-COVID-19	2020		
<b>Overall</b>				
Total	5.13	8.66	1.69 (1.53-1.87)	<.001
Total-other	4.76	7.25	1.52 (1.37-1.70)	<.001
Upper extremity	2.21	3.80	1.72 (1.48-2.00)	<.001
Lower extremity	1.67	1.98	1.19 (0.97-1.46)	.115
Spine/core	0.88	1.47	1.67 (1.31-2.13)	<.001
Other	0.37	1.41	3.81 (2.94-4.94)	<.001
Early season <sup>b</sup>	5.91	8.66	1.47 (1.33-1.62)	<.001
<b>Pitchers</b>				
Total	5.87	9.84	1.68 (1.47-1.91)	<.001
Total-other	5.57	8.65	1.55 (1.35-1.79)	<.001
Upper extremity	3.31	5.68	1.72 (1.44-2.04)	<.001
Lower extremity	1.27	1.22	0.96 (0.66-1.39)	.923
Spine/core	0.99	1.76	1.78 (1.30-2.43)	<.001
Other	0.30	1.19	3.97 (2.65-5.93)	<.001
Early season <sup>b</sup>	6.43	9.85	1.53 (1.34-1.75)	<.001
<b>Fielders</b>				
Total	4.44	7.48	1.68 (1.45-1.96)	<.001
Total-other	4.00	5.85	1.46 (1.23-1.73)	
Upper extremity	1.19	1.92	1.61 (1.20-2.18)	.002
Lower extremity	2.04	2.73	1.34 (1.04-1.72)	.024
Spine/core	0.77	1.19	1.55 (1.06-2.26)	.033
Other	0.44	1.63	3.70 (2.63-5.21)	<.001
Early season <sup>b</sup>	5.43	7.48	1.38 (1.19-1.60)	<.001

<sup>a</sup>Bolded P values indicate statistically significant difference between groups (P ≤ .05). IRR, incidence rate ratio.

<sup>b</sup>Early season = March, April, May of pre-COVID-19 seasons.

group for all players, pitchers, and fielders (P < .001). Further analysis of injury categorization by body part in the overall cohort showed a significantly higher incidence of groin, spine/core, hand/wrist, elbow/forearm, chest/shoulder, and other upper extremity injuries (P ≤ .011). Additionally, infections and miscellaneous injuries were significantly increased in 2020 (P < .001); however, the incidence of foot and ankle injuries slightly but significantly decreased in 2020 (P = .042) (Table 2).

In the subgroup analysis by position, pitchers were found to have overall increased injury incidence for upper extremity injuries, spine/core injuries, and other injuries in 2020 (Table 1 and Figure 3). Fielders showed a similarly increased incidence of upper extremity and other injuries; however, they did not sustain significantly more spine/core injuries in 2020 compared with the pre-COVID-19 cohort (Table 1 and Figure 4). In an analysis of pre-COVID-19 injury incidence in March, April, and May compared with 2020 injury incidence, IRR remained significantly elevated (P < .001) (Table 1).

The proportion of injuries between upper extremity, lower extremity, spine/core, and other differed significantly

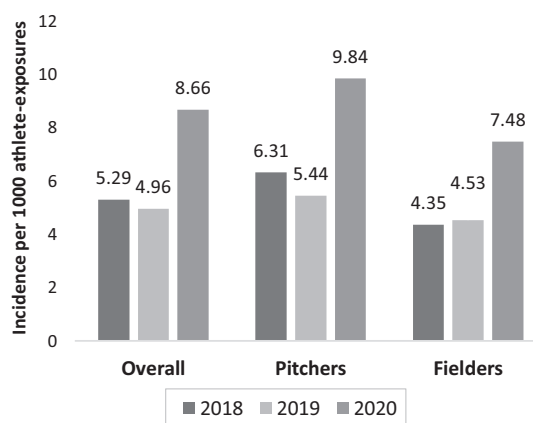


Figure 1. Incidence of injury per 1000 athlete-exposures. The 2020 season had the highest incidence of injury overall, for pitchers, and for fielders.

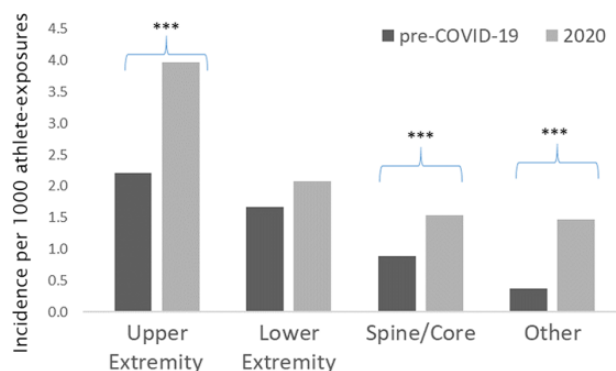


Figure 2. Overall cohort injury incidence per 1000 athlete-exposures by anatomic zone. \*\*\*P < .001.

in the overall cohort as well as the pitcher and fielder subgroups (P < .001) (Table 3). A post hoc analysis showed that there was a significantly lower proportion of injuries categorized as lower extremity, while a significantly greater proportion of injuries were categorized as other.

## DISCUSSION

The primary finding of this analysis was that the rate of placement on the IL increased during the 2020 MLB season compared with pre-COVID-19 seasons, which was not fully explained by an increase in COVID-19-related IL placements. Overall injury incidence increased equally for pitchers and fielders and remained after removing infection from consideration. The increase in incidence occurred in all broad injury categories other than those listed as lower extremity; however, analysis of the lower extremity injury by specific anatomic zone showed an increased incidence of groin injury in the 2020 season. Additionally, injury incidence increased for every anatomic zone of the upper extremity. These changes in incidence led to a decreased proportion of lower extremity injuries, although the

TABLE 2  
Detailed Injury Breakdown by Body Part<sup>a</sup>

Body Part	Incidence per 1000 Athlete-Exposures		IRR (95% CI)	P Value
	Pre-COVID-19	2020		
Foot/ankle	0.32	0.14	0.44 (0.21-0.93)	<b>.042</b>
Knee	0.30	0.33	1.10 (0.67-1.82)	.841
Hip	0.15	0.11	0.73 (0.31-1.74)	.506
Hamstring	0.44	0.61	1.39 (0.96-2.01)	.100
Groin	0.19	0.36	1.89 (1.16-3.10)	<b>.011</b>
Other lower extremity	0.26	0.41	1.58 (1.00-2.49)	.07
Spine/core	0.88	1.47	1.67 (1.31-2.13)	<b>&lt;.001</b>
Head	0.21	0.18	0.86 (0.44-1.69)	.814
Hand/wrist	0.51	0.78	1.53 (1.10-2.13)	<b>.017</b>
Elbow/forearm	0.74	1.55	2.09 (1.65-2.66)	<b>&lt;.001</b>
Shoulder/chest	0.78	1.15	1.47 (1.12-1.94)	<b>.007</b>
Other upper extremity	0.17	0.34	2.00 (1.20-3.32)	<b>.008</b>
Infection	0.05	0.55	11.00 (6.79-17.82)	<b>&lt;.001</b>
Miscellaneous	0.11	0.68	6.18 (4.16-9.18)	<b>&lt;.001</b>

<sup>a</sup>Bolded P values indicate statistically significant difference between groups ( $P \leq .05$ ). IRR, incidence rate ratio.

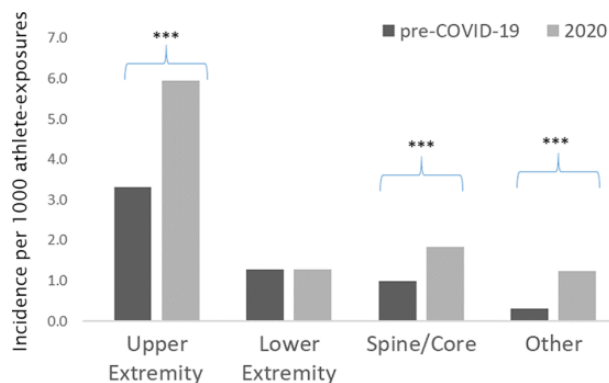


Figure 3. Pitcher injury incidence per 1000 pitcher exposures by anatomic zone. \*\*\* $P < .001$ .

incidence of lower extremity injuries in 2020 was not significantly different from that of pre-COVID-19 seasons.

The most significant increase in injury rate occurred due to the increase in injuries categorized as other. This category included infections, which saw a significant increase compared with pre-COVID-19 (IRR, 11.00) (Table 2). While infection and miscellaneous remained a relatively uncommon reason for IL placement in 2020 compared with soft tissue injury, the dramatically elevated IRR was due to the extremely low incidence in the infection and miscellaneous category pre-COVID-19 (Table 2). A substantial proportion of these 2020 IL placements was due to COVID-19 infection. According to the MLB, 57 players tested positive for COVID-19 in the 2020 season.<sup>31</sup> The increase in miscellaneous IL placements with no specified reason for placement

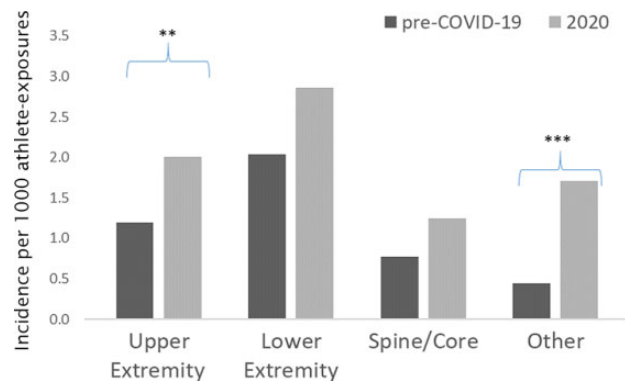


Figure 4. Fielder injury incidence per 1000 fielder exposures by anatomic zone. \*\* $P < .01$ , \*\*\* $P < .001$ .

TABLE 3  
Proportion Breakdown of Injury by Anatomic Zone<sup>a</sup>

	Percentage of Injuries		
	Pre-COVID-19	2020	P Value
Overall	N = 1246	N = 424	
Upper extremity	43.0	43.9	.757
Lower extremity	32.6	22.9	<b>&lt;.001</b>
Spine/core	17.1	17.0	.960
Other	7.3	16.3	<b>&lt;.001</b>
Pitchers	n = 685	n = 241	
Upper extremity	56.4	57.7	.719
Lower extremity	21.6	12.4	<b>.002</b>
Spine/core	16.9	17.8	.749
Other	5.1	12.0	<b>&lt;.001</b>
Fielders	n = 561	n = 183	
Upper extremity	26.7	25.7	.779
Lower extremity	46.0	36.6	<b>.026</b>
Spine/core	17.3	15.8	.653
Other	10.0	21.9	<b>&lt;.001</b>

<sup>a</sup>Chi-square for the overall group, pitchers, and fielders,  $P < .001$ . Bolded P values indicate a statistically significant difference between groups ( $P \leq .05$ ).

is likely attributable to the required testing protocols of the MLB for those players with exposure to the virus.<sup>33</sup> When removing the other categorization entirely from both the pre-COVID-19 and the 2020 cohorts and comparing total injury incidence, the difference remains significant.

Despite a notable portion of the incidence increase being directly or indirectly due to COVID-19 infection, the increased incidence of injury to the musculoskeletal system remains as displayed in the “total-other” categories. While Posner et al<sup>35</sup> noted that the incidence of IL placements was highest early in the season, our data suggest that the increased incidence of injury in 2020 was not solely due to measuring the expected rate of early season IL placements. In the pre-COVID-19 seasons, while incidence rates in March, April, and May were elevated compared with total season incidences, the 2020 injury incidences remained significantly higher (Table 1). Such a finding suggests the



rapid escalation in workload at the beginning of the 2020 season may have caused stress for which the athletes were unprepared, a pattern noted by Gabbett<sup>15,16</sup> as a frequent risk pattern. Preseason training in 2020 was reduced to 3 weeks of summer camp, which started on July 1.<sup>3</sup> Typical MLB preseason training begins in late February and runs through late March.<sup>22</sup> The shortening of preseason preparation and its associated conditioning workload both increase the risk of injury. A recent systematic review reported multiple studies showing acute to chronic workload ratio (ACWR) to be a significant risk factor for thousands of athletes in a variety of high-level and professional sports.<sup>2</sup> For example, Blanch and Gabbett<sup>5</sup> showed noncontact soft tissue injuries significantly increase with a higher ACWR in elite cricket, rugby, and Australian rules football players. Using data from the 3 sports, injury rates reached nearly 15% with an ACWR of 2:1 and 98% when ACWR was 4:1.<sup>5</sup> While ACWR is a predictor of injury risk, ACWR does not specifically translate to throwing injury risk; however, the dramatic increase in upper extremity injury incidence in 2020 MLB players demonstrates that interrupted sport-specific training is associated with greater injury risk. The number of doubleheaders in the 2020 season was greater than 2018 and 2019 and may have also contributed to the increased injury rate.<sup>3</sup> This scheduling idiosyncrasy in 2020 increased the work density of the season, perhaps leading to even greater increases in ACWR. Overall, the increase in injuries in the 2020 MLB season suggests that the players may have been subjected to a higher ACWR, thus increasing their chances of injury.

The increased incidence of spine/core injuries and upper extremity injuries are also likely related. Biomechanical studies have shown that lower body and trunk weakness or instability increases the stress placed on a thrower's upper extremity.<sup>6,12,23,46</sup> A recent supporting biomechanical study identified significant associations between sagittal trunk position and elbow varus torque during throwing in 99 college pitchers.<sup>42</sup> In studies examining specific injuries in overhead throwers, Radwan et al<sup>37</sup> showed that balance and core stability was significantly lower in National Collegiate Athletic Association Division III overhead throwing athletes with a history of shoulder dysfunction. Garrison et al<sup>17</sup> showed similarly decreased balance in baseball players with ulnar collateral ligament tears versus healthy controls. Both studies suggest core weakness may result in poor throwing biomechanics that increase risk for upper extremity injury. In a biomechanical study of pitching from Fleisig et al,<sup>14</sup> the authors suggested that muscle fatigue and weakness in the shoulder could increase joint instability as the rotator cuff attempted to resist force on during a throw, potentially leading to injury. Kibler and Sciascia<sup>23</sup> synthesized recent biomechanical evidence to describe the pathomechanics of pitching that may increase injury risk. The fundamental sources of pathomechanics in each phase of throwing were found to be poor hip and core control during the windup, a weak pushoff during stride, poor trunk position during arm cocking, inefficient energy transfer in the kinetic chain during acceleration, and improper lower body position to dissipate force during follow-through and deceleration.<sup>40</sup> In each phase, a strong,

conditioned lower body and core is critical to maintaining proper mechanics to reduce injury risk.

Furthermore, inadequate preparatory time may not have allowed proper neural adaptation to sport-specific movement patterns, thus compounding any muscular weakness. Electromyographic nerve testing in multiple muscle groups has shown significantly more motor unit activation in muscle with specific training compared with untrained muscle.<sup>39</sup> In 1 such study, 6 weeks of training of the first dorsal interosseous muscle led to significant synchronization of motor units.<sup>28</sup> Lack of synchronization leads to lesser power output due to uncoordinated muscle contraction.<sup>39</sup> Limited data exist to show the optimal timing for maximizing neural coordination; however, a lack of sufficient neural adaptation preseason may have led to inefficient recruitment of motor units and increased injury risk due to already unconditioned musculature. While we cannot confirm from the available data that the increased injury incidence during the 2020 MLB season is solely attributable to deconditioning, the correlation between a spike in injury incidence and an extended off-season with delayed preseason training suggests that deconditioning of both the musculoskeletal and nervous systems may have played a role.

The lack of increase in lower extremity injuries is somewhat surprising since poor landing mechanics increases the risk of knee injuries. Poor core strength and decreased neuromuscular control are both direct risk factors for noncontact anterior cruciate ligament (ACL) injuries.<sup>19</sup> In basketball, trunk neuromuscular deficits<sup>48</sup> and biomechanical deficits at the knee and hip<sup>20</sup> are significant risk factors for ACL injury. In addition, balance training has been shown to significantly reduce ankle injuries in soccer and volleyball,<sup>4,25,44</sup> suggesting the importance of core strength in lower extremity injury prevention. Despite the theoretical risk, our analysis did not see an increase in lower extremity injuries. Lower extremity conditioning may be more easily achieved in pandemic lockdown settings since those exercises and trainings may be completed in isolation and have several bodyweight strength options that do not require fitness equipment; conversely, throwing and bullpens naturally require at least 1 other person. This concept is supported by the significantly decreased foot and ankle injuries that were recorded in 2020. Most lower extremity-focused movements of running and cutting are easier to replicate without access to teammates or additional equipment. Movements focused on the upper extremity, such as overhead throwing, and dynamic movements, such as hitting, require more than 1 individual, additional space, and/or additional equipment. Players were likely unable to perform the volume or intensity of these movements that they were accustomed to in preparation for the season due to pandemic-related social and facility restrictions.

Compared with previous MLB injury epidemiological studies, we found a relatively higher injury incidence in all 3 years analyzed. Posner et al<sup>35</sup> investigated 7 years of MLB data from 2002 to 2008 and found an overall injury incidence of 3.61 per 1000 athlete-exposures, compared with the calculated incidence of 5.13 in the pre-COVID-19 seasons and 9.06 in 2020. In fact, the lowest

injury incidence year in our analysis (2019, incidence of 4.96 per 1000 athlete-exposures) was higher than the highest injury incidence year in the analysis by Posner et al (2008; incidence of 3.55). Though 2020 showed a significant increase in injury incidence among recent MLB seasons, our data suggest that injury incidence has increased overall in recent years. Such a finding may be in part due to a trend toward increases in performance metrics that put players at higher risk for injury, such as fastball velocity<sup>8,10,21,43</sup>; however, future studies should establish clear causes for the increases in injury incidence such that effective prevention may be implemented. This general trend toward increased injury in baseball was a major reason for selecting the only most recent 2 years for incidence comparison with 2020 to minimize the confounding effect of the expected injury incidence trend.

The baseball injury incidence in 2020 was higher than the reported incidence in soccer (9.6 injuries per 1000 hour-exposures or 6.4 injuries per 1000 match-exposures), which was surprising since soccer is a contact sport with near-constant cutting and pivoting.<sup>24</sup> As expected, the incidence did not meet the threshold of the National Football League in the 2010-2019 seasons, which exhibited 2970 injuries over 10 seasons and, when averaged, translates to 12.6 injuries per 1000 athlete-exposures.<sup>41</sup> The MLB exposures remained lower than the traditional exposures of the National Basketball Association (19.1 per 1000 exposures) and National Hockey League (15.6 per 1000 exposures).<sup>11,27</sup> Each of these studies suggests that while the MLB experienced a significant injury surge in 2020, the injury incidence of baseball did not exceed the high rate of other professional sports leagues with significantly more physical contact expected during play.

As with all studies, this investigation has limitations. The specific population of MLB players renders these results not generalizable to all athletes. Utilizing publicly accessible data also limits the ability to take into account all details of each injury. We were able to account for only injuries that resulted in a placement on the IL and did not capture injuries that did not result in an IL listing; this limitation suggests we may be underestimating the true incidence of injury. Additionally, we were limited in the amount of injury detail that was made publicly available. Particularly in 2020, many IL placements were made without a specific reason publically given, thus sorted as other in our analysis. Many of these placements may have been due to the COVID-19 protocol; however, in many cases, we were unable to confirm the reason for placement. In addition, in 2020 the 60-day IL was reduced to 45 days.<sup>29</sup> This difference, combined with the inadequate injury detail, did not allow for an assessment of differences in injury severity between 2020 and previous seasons. The lack of detail in soft tissue injuries leads to the potential suspicion of COVID-19 contact tracing to be underreported under the guise of common baseball injuries, but transparency provided by the MLB as well as an oversight of outbreaks provided by the Centers for Disease Control<sup>33</sup> makes this possibility unlikely. Another limitation of the public database is the inability to control for roster-management differences in 2020. The unavailability of minor league

players and the inclusion of the additional traveling players<sup>3</sup> significantly affected how rosters were managed to maintain a full roster throughout the season. Because placement on the IL is ultimately a roster-management decision, using IL transactions is not a perfect secondary measure for injury. Furthermore, 22 players opted out of the 2020 season,<sup>47</sup> causing the expanded roster of players to fill in for their roles. These potentially inexperienced players may have been at higher risk of injury, but the relatively low rate of opt-outs suggests such an effect would be minor. In the future, more in-depth data about player injuries should be used in conjunction with large, publicly available data sets to identify risk factors for specific pathologies.

## CONCLUSION

The incidence of placement on the IL increased significantly during the 2020 MLB season compared with the 2 prior seasons. Upper extremity injury and spine/core injuries were the most affected anatomic zones. Other reasons for IL placement also increased, in part because of COVID-19-related IL placements. Our analysis supports the importance of specific preseason training to allow adequate muscular, tendinous, and neural adaptations to occur before high-level play is achieved.

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